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Strengthening Nutrition in the Integrated Community Case Management of Childhood Illness in Democratic Republic of Congo

Qualitative Research Report

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Abbreviations

ARI	acute respiratory infection
CHW	community health worker
DHS	Demographic and Health Survey
DPS	<i>division provinciale de la santé</i> (provincial health division)
DRC	Democratic Republic of the Congo
EBF	exclusive breastfeeding
FGD	focus group discussion
iCCM	integrated community case management
IDI	in-depth interview
IMCI	integrated management of childhood illness
IYCF	infant and young child feeding
MAM	moderate acute malnutrition
MCHIP	Maternal and Child Health Integrated Program
MCSP	Maternal and Child Survival Program
MOPH	Ministry of Public Health
MUAC	mid-upper arm circumference
ORS	oral rehydration salts
PRONANUT	<i>Programme National de Nutrition</i> (DRC national nutrition program)
RDT	rapid diagnostic test
RECO	<i>relais communautaire</i> (name of CHW in DRC)
SAM	severe acute malnutrition
SBCC	social and behavior change communication
SD	standard deviation
SSC	<i>site de soin communautaire</i> (community care site)
USAID	United States Agency for International Development
WHO	World Health Organization

Selected List of Local Foods

<i>Bakeki ya bukoko/bakeke (keke)</i>	Decoction made from a wild fruit. Consumed instead of tea by people of all ages, but it is especially recommended for stimulating breastmilk production in breastfeeding women.
<i>Bouillie</i>	Porridge prepared from flour of soy, plantain, cassava, or corn (and sometimes biscuits/cookies) with sugar and palm oil.
<i>Cowbell</i>	A brand of powdered milk, sold in small sachets of 8 or 10 g, to which water is added before serving.
<i>Fufu/masango</i>	Maize. Milled to produce flour, which is mixed with cassava flour to produce fufu, a staple food.
<i>Koko</i>	Sugarcane
<i>Kwanga (chikwange)</i>	Starchy paste made from cassava that has been retted, pounded, and cooked, then wrapped in leaves (<i>Megaphrynium macrostachyum</i>). A staple food that can be conserved for several days.
<i>Lituma</i>	Starchy paste. Made from cooked fresh cassava that has been pounded, cooked and pounded plantains, or a combination of cassava and plantains. A staple food.
<i>Matembela</i>	Green, leafy vegetable from sweet potato leaves, typically served alongside a staple food, such as kwanga, lituma, or fufu.
<i>Mboka</i>	Any kind of fish or meat, served with sauce made from palm oil, tomatoes, onion, and sometimes soy or peanut flour.
<i>Mbosu/mbochi/mumbochi</i>	A type of vegetable/plant, similar to <i>sombé</i> , said to stimulate maternal breastmilk production.
<i>Mucica/bitekuteku</i>	Amaranth leaves. A green vegetable consumed as a side dish. The seeds are rich in carbohydrates and high-quality proteins (why it is considered a pseudocereal).
<i>Ngonda</i>	A variety of long river fish.
<i>Sombé</i>	Cassava leaves. A green, leafy vegetable that is cultivated and consumed throughout DRC.
<i>Vigna</i>	A dried pulse that takes the form of a small, chocolate-colored bean. It is rich in high-quality proteins and consumed by itself or with rice.

Executive Summary

Introduction

In Democratic Republic of the Congo (DRC), child malnutrition rates are high. Recent DRC Demographic and Health Survey (DHS) data indicate that 43% of children under 5 suffer from stunting, 8% are wasted, and 23% are underweight. The majority (60%) of children 6–59 months old are anemic (hemoglobin <11 g/deciliter). Early initiation of breastfeeding and exclusive breastfeeding (EBF) up to 6 months old, introducing complementary foods from 6 months old, and continued breastfeeding are critical to children's growth, development, and health. However, DHS data from DRC indicate that these practices are not optimal. The three main killers of children under 5—malaria, diarrhea, and pneumonia—remain a significant challenge, and only about 40% of children showing signs of fever, acute upper respiratory infection, or diarrhea are taken to a medical facility or a health professional for treatment. The prevalence of malaria among children under 5 is about 30%, and national health statistics indicate that 40% of all outpatient visits are for suspected malaria.

In DRC, the Maternal and Child Survival Program (MCSP) is working in collaboration with the Ministry of Public Health (MOPH) to strengthen the national integrated management of childhood illness (IMCI) and integrated community case management (iCCM) strategies, and supporting their rollout in Tshopo and Bas-Uélé provinces. Part of the IMCI strategy includes assessing the nutritional status of sick children and counseling mothers on how to feed their children. The iCCM guidelines primarily focus on the identification, treatment, and referral of children who have diarrhea, pneumonia, and/or malaria. The nutrition component of iCCM is limited to screening for malnutrition, which includes identification, referral, and subsequent treatment of severe acute malnutrition (SAM). It provides brief guidance on continued feeding of sick children. The preventive aspects of nutrition within iCCM guidelines—including strengthening infant and young child feeding (IYCF) practices around breastfeeding, complementary feeding, and counseling skills of health providers at the community and facility level on IYCF—are weak, as the main focus of the approach is on treatment.

MCSP, the MOPH, the *Programme National de Nutrition* (DRC national nutrition program, or PRONANUT), and others have identified the need for strengthening the iCCM strategy's nutrition content, making sure it is consistent with and based on local knowledge, beliefs, and feeding practices. This should go hand in hand with an approach that assures that community- and facility-based health providers deliver the content as intended in a supportive way.

This study has four main objectives:

1. Examine cultural beliefs and perceptions of IYCF, child illness, and care-seeking behavior for sick children.
2. Examine the perspectives of health providers who provide counseling on nutrition and iCCM.
3. Understand roles of key influential family/community members.
4. Identify gaps and opportunities to strengthen nutrition counseling for caretakers of children under 5 at the health facility and community level.

Methods

This mixed-methods study combines qualitative research methods (in-depth interviews [IDIs] and focus group discussions [FGDs]) with quantitative assessments of child nutritional status. It was conducted in the four health zones of Bengamisa, Yakusu, Yaleko, and Ubundu in Tshopo Province, where MCSP is implementing the iCCM package. The *Childhood Stunting: Context, Causes and Consequences: WHO Conceptual Framework* was adapted for the study to provide a structured contextual approach to exploring behaviors, perceptions, and cultural beliefs that affect IYCF practices, and to better understand the roles played by families, caregivers, and health providers in the care and feeding of young children. Data collection took place from January to March 2017. IDIs of 127 mothers, fathers, and grandmothers of children under 5 were conducted to determine practices, beliefs, and perceptions regarding IYCF, child illness, and care-seeking behaviors. Interviews with mothers of children 0–59 months included additional data collection to assess children’s diet and nutritional status, including a food frequency questionnaire and anthropometric measurements—weight, length, or standing height, and mid-upper arm circumference. Additional IDIs were conducted with facility-based health providers (nurses and doctors) and traditional healers. Eight FGDs were conducted with 56 community health workers (CHWs, or *relais communautaires*/RECOs) who provide counseling or treatment for iCCM (*relais promotionnels* or RECO sites, respectively). These IDIs and FGDs were focused on the quality of counseling, treatment(s) administered for child illness, level of knowledge, and advice given to mothers and families on child illness, care practices, and IYCF by various cadres of health providers.

Questionnaires were administered and recorded in various local languages. Responses were translated and transcribed into French. The institutional review boards at John Snow Inc. and the Kinshasa School of Public Health in DRC granted ethical approval.

Data were analyzed iteratively and collaboratively with the participation of the DRC-based study coordinators, the Washington, DC-based primary investigators, and remotely based qualitative research consultants/data collectors. Preliminary analysis was conducted to identify dominant themes and develop a coding structure. Qualitative analysis of transcripts was then carried out to explore respondents’ knowledge, perceptions, practices, barriers, and motivators for optimal nutrition and child health practices, and to interpret and contextualize quantitative data obtained via the food frequency questionnaires and anthropometric measurements. Preliminary results were presented in November 2017 at a workshop for national stakeholders in Kinshasa and in December 2017 for provincial stakeholders in Kisangani (the capital of Tshopo Province). Participants provided further analysis and made recommendations on approaches for strengthening integration of nutrition into iCCM programming.

Key Findings

According to respondents in the community, including family members and traditional healers, children’s health, growth, and nutrition are strongly linked. Family members often said a healthy child was a well-nourished child and vice versa, and connected healthy growth, appetite, and good nutrition into a single category. Conversely, community perceptions of child illness are linked to poor growth and poor nutrition. As one mother said, “A child who is not growing well, that is to say who’s sick, whereas if he’s in good health, he can grow well.” Families recognize a variety of Western diseases and local illnesses, which can have both natural and spiritual etiologies.

Breastfeeding had a very favorable image among communities in the study: Mothers and families say breastmilk is the “best food” for babies and should be the only food until the child reaches 6 months old. Mothers wished to continue breastfeeding for 2 years or more. Sometimes early initiation of breastfeeding is impeded when mother and baby are separated after delivery at the health center, yet health providers told mothers to give colostrum, which in most cases they did. However, mothers were often unclear on the reason for doing so, and a minority said this breastmilk was not “clean,” as indicated by its yellowish color.

Diminished quantity and quality of breastmilk are linked to illness in children in the first 6 months of life. Families said that quantity could be insufficient when mothers did not have enough to eat themselves and that quality could be reduced when mothers spaced feedings too far apart, ate taboo foods, or infected their babies with *kunde* (refer to Table 7 for a list of selected local diseases mentioned by respondents). Mothers' need to work in the field led to early introduction of foods before 6 months, as families gave other foods to babies crying from hunger while the mother was away. Porridge or *bouillie* is the first food children eat (introduced between 3 and 6 months), followed by soft and then harder foods, which are introduced progressively. Children's diets in Tshopo Province were predominately fruits and vegetables, which comprise 34% of foods consumed on a daily basis (inclusive of fruits and vegetables rich in vitamin A). Carbohydrates, such as tubers (e.g., cassava, potatoes); thin, watery porridge; and watery soups with small bits of meat are the main features of young Congolese children's diet. Daily intake of red meat was 8% of all foods on average. River fish was rarely eaten on a daily basis. The diet primarily lacked protein-rich animal source foods, and quantities of food consumed were small in comparison to the needs of young children. Frequency of meals was difficult to ascertain. Data showed some consumption of sweetened foods and warm/sweetened beverages, which displaced consumption of nutritious foods.

Despite stunting affecting about 40% of children in DRC, there was a lack of recognition and awareness of it. This form of malnutrition may go unnoticed, as families often compared children's size to others in their age cohort. Few families spoke of their own children being severely malnourished, as SAM is a rare occurrence, though they often were able to describe the clinical signs of SAM, or *kwashiorkor* (locally defined as a severe form of malnutrition), namely changes in hair and skin color, swollen limbs and cheeks, listlessness, etc. Acute malnutrition or any indication of "poor growth" also may be considered a shameful disease (associated with poverty) and be a reason not to seek care.

Families seek modern and traditional treatment sequentially or at the same time. The choice between the two depends on the type of disease (traditional or modern), its severity, and, especially, cost. When basic home care does not result in improvement, families' first recourse is usually traditional healers, who provide diagnosis; plant-based, spiritual, and occasionally Western remedies; and referral to the health center. Traditional healers are accessible to families because they live nearby, take appointments at more flexible times than modern health providers, and are very flexible about payment. RECOs refer and accompany families to the health center and may provide some basic care for uncomplicated cases if they have the supplies. They appear to be underutilized based on families' reports of receiving counseling, diagnosis, or care from this cadre. Health providers often criticized families' "carelessness" (*négligence*) or ignorance when they failed to bring their children to the health center or follow medical advice. The blame was often put on the mother, whether for neglecting her child by working in the fields, infecting the child with *kunde*, giving him diarrhea after eating inappropriate or taboo foods, etc. Mothers and families more generally appeared caught in a bind between living conditions, rendering them unable to provide good and beneficial care to their children, and condemnation from circumstances outside their control.

Key Recommendations and Way Forward

The gaps in nutrition and iCCM services identified by this research provide indications for how to harmonize services and protocols, increase referrals, and integrate and strengthen the prevention and treatment of malnutrition among children under 5 at facility and community levels in Tshopo Province in DRC. The integrated nutrition and iCCM package should build on study findings and on other learning and information gathered during MCSP. To assure better harmonized services and protocols for child health and nutrition, thus strengthening services for children under 5 at facility and community levels through an integrated IMCI/iCCM/nutrition package, it is important that child health and nutrition divisions at all levels in the MOPH work together.

National-Level Recommendations

- Review and revise guidance, curricula, and support materials to strengthen nutrition counseling for IYCF, including increasing dietary diversity, meal frequency, quantities of food consumed, and feeding of foods and liquids during and after illness for sick children, and integrating the management of SAM and moderate acute malnutrition (MAM) at community level. The country needs to strengthen the capacity of CHWs around IYCF counseling and in the management of SAM and MAM in the community, pending availability of supplies to treat acute malnutrition.
- Review, adapt, and revise existing social and behavior change communication (SBCC) materials to support optimal IYCF practices and counsel on challenges that mothers and families face. These challenges include the separation of mother and baby immediately after delivery, perceptions of insufficient breastmilk, maintaining breastmilk supply, early introduction of foods and liquids before 6 months old, weak complementary feeding practices, and feeding practices during and after child illness, which can be conducted through well-child clinic consultations at under-5 clinics and community-based activities.
- Advocate for strengthening nutrition within iCCM. All stakeholders at the national level should also advocate with national leaders to prioritize:
 - Funding for children's health and nutrition to strengthen nutrition and child health interventions at the facility and community level
 - Adequate funding for and the strengthening of community care sites (*sites de soins communautaires*, or SSCs) and CHWs
 - Adequate and reliable supplies of quality equipment, commodities, and drugs for facilities and SSCs
 - The integration of IYCF, management of MAM, and management of uncomplicated SAM cases in SSCs

Provincial- and Health Zone-Level Recommendations

- Disseminate the new national iCCM/nutrition policies and guidelines to strengthen IYCF counseling, management of MAM, and capacity of CHWs and health providers in the management of MAM and SAM.
- Strengthen health provider capacity (including that of RECOs) through training on IYCF and on IMCI/iCCM and treatment of MAM and SAM.
- Equip health workers with updated SBCC materials, including key culturally relevant messages and illustrated counseling cards on IYCF practices (e.g., feeding during and after illness).
- Strengthen the preventive components of nutrition with iCCM using the adapted counseling cards to assure facility- and community-based health workers are well equipped and trained to:
 - Avoid separation of mother and baby after delivery, and assure early initiation of breastfeeding.
 - Counsel on early introduction of foods prior to 6 months of age and how it disrupts EBF practices.
 - Counsel and provide support on breastfeeding challenges, including counseling on perceptions of insufficient breastmilk linked to child/maternal illness, maintaining breastmilk supply, and expressing breastmilk, during periods the mother is away.
 - Counsel on appropriate complementary feeding practices, with an emphasis on quantity, diversity, and frequency of foods to provide for children 6–23 months old.
 - Counsel caregivers on feeding children during and after illness.

- Develop or collect local complementary feeding recipes to improve practices based on readily available local foods and cultural beliefs around these foods to increase dietary diversity, quantity of food consumed, frequency of meals, and protein intake. Use recipes during cooking demonstrations conducted in mother-to-mother support groups.
- Strengthen the quality of services and improve counseling on IYCF practices during contacts with caregivers, from well-child visits, to visits for sick children (within the context of case management), to community-level contact points (including home visits).
- Strengthen and maintain the skills of facility- (nurses) and community-based providers (RECOs) through supportive supervision and updated curricula.
- Target and strengthen engagement with key influencers—grandmothers, fathers, traditional healers, and other influential members of the community—to encourage good IYCF practices. Capitalize on/use existing community groups or establish mother-to-mother and community support groups to maximize community reach. Work with and support community organizations to create or strengthen community groups.
- Explore innovative ways to work alongside traditional healers. Health management teams should explore how they can facilitate and rationalize referral, encourage the dispensing of oral rehydration salts/zinc for simple cases of diarrhea, and provide nutrition advice for certain key IYCF practices, such as breastfeeding messages.
- Ensure consistent supply of supplementary foods for treatment of MAM and SAM by liaising with PRONANUT and other implementing partners, and advocating for a steady supply at facility and community levels.

Introduction

Nutrition and Child Health in DRC

In Democratic Republic of the Congo (DRC), maternal and child malnutrition rates are high. One in seven women (14%) is categorized as too thin, with a body mass index of less than 18.5 kg/m², and more than one-third of women ages 15–49 (38%) are anemic [1]. Recent Demographic and Health Survey (DHS) data indicate that approximately 43% of children under 5 suffer from stunting, 8% are wasted, and 23% are underweight (Table 1). Furthermore, the majority (60%) of children ages 6–59 months are anemic (<11 g/deciliter) [1]. Likely causes of anemia are micronutrient deficiencies, especially iron and vitamin B12; infections, including malaria and helminths; chronic or recurrent illness; and inadequate infant and young child feeding (IYCF) practices.

Early initiation of breastfeeding and exclusive breastfeeding (EBF) until 6 months old; introducing nutritious foods beginning at 6 months old, with adequate diversity and frequency; and continued breastfeeding are critical components of optimal IYCF practices for growth, development, and health. EBF until 6 months old is defined as feeding the child *only* breastmilk, with the exception of oral rehydration salts (ORS), vitamins, minerals, or drugs. Breastfeeding is the most cost-effective infant feeding strategy for food-insecure families, providing optimal nutrition and protection against infections and illnesses (e.g., diarrhea and pneumonia) [2, 3].

According to national-level DHS data, in DRC, all infants are breastfed after birth, but only half (52%) are put to the breast within the first hour of life, and only one-fifth (22%) of children are exclusively breastfed by 4 to 5 months old [1]. Nearly all (98%) infants continue to be breastfed at 9–11 months old. A recent study from Kinshasa indicates that EBF practices are inadequate due to a lack of training among health care workers on how to best support breastfeeding, the misconception among mothers that infants need other liquids (e.g., water, tea, breastmilk substitute, porridge) aside from breastmilk to improve digestion, and the misconception that early introduction of nonbreastmilk is seen as a means to address breastmilk insufficiency among urban mothers [4]. Once foods are introduced to children to complement breastmilk when they are 6–23 months old, data show that few children receive a minimum acceptable diet (14% urban versus 8% rural) (Table 1). EBF during the first 6 months of life has improved nationally (from 17% of children 4–5 months old in 2007 to 48% in 2013–14), but complementary feeding practices are suboptimal (Table 1), and there has been little improvement in IYCF indicators since the previous DHS (2007), suggesting that nutrition indicators have lagged for nearly a decade.

Table 1. Nutritional indicators in Democratic Republic of the Congo

Indicator	2007–2008	2013–2014
Child mortality rate	148 per 1,000 live births	104 per 1,000 live births
Stunting (children under 5)	46%	43%
Underweight (children under 5)	25%	23%
Anemia (children 6–59 months)	71%	60%
Exclusive breastfeeding (children 4–5 months old)	17%	48%
Minimum meal frequency (breastfed children 6–23 months old)	32% (urban) 30% (rural)	34% (urban) 38% (rural)
Minimum acceptable diet (breastfed children 6–23 months old)	17% (urban) 18% (rural)	14% (urban) 8% (rural)
Minimum dietary diversity (breastfed children 6–23 months old) * categorized differently in 2008, as consumption of at least three food groups, rather than four	50% (urban) 54% (rural)	28% (urban) 15% (rural)

Source: DRC DHS (2008 and 2014 reports)

Strengthening Integration of Nutrition into Integrated Community Case Management

Further strengthening integration of nutrition into integrated community case management (iCCM) provides an opportunity to strengthen IYCF and care practices, improve child nutritional status, and reduce rates of child morbidity and mortality. iCCM guidelines [5] focus on the identification, treatment, and referral of children who have diarrhea, pneumonia, and/or malaria as well as malnutrition, but the guidelines are often weak in supporting improvements in IYCF. The iCCM guidelines incorporate nutrition components, including the identification of acute malnutrition (by measuring a child's mid-upper arm circumference [MUAC] and the presence of bilateral pitting edema), immediate referral of severe acute malnutrition (SAM) cases, and guidance on the continued feeding of any sick child treated at home [5, 6]. However, the implementation of iCCM—including preventive components—is often not delivered with the intensity, quality, and coverage needed to achieve improvements in child nutritional status. A review of operational experiences and evidence of linkages between iCCM and nutrition revealed that iCCM's nutrition components need to be strengthened to improve the coverage and quality of services for sick children, optimize the preventive aspects of iCCM, improve implementation of the UNICEF/World Health Organization (WHO) iCCM package, and strengthen linkages between the community and health facility, while also linking health and nutrition at the institutional level [6]. An analysis of iCCM country experiences summarized current nutrition-related iCCM practices according to four typologies (see Table 2 for summaries of each typology and country examples).

Table 2. Four typologies for integrating nutrition into integrated community case management (iCCM)

General Description	Country Implementation Examples
<i>Typology 1. Advising on “feeding the sick child” within existing iCCM services</i>	
Community health workers (CHWs) perform home visits for sick children to counsel caregivers on home treatment methods, when to seek further medical care, and appropriate infant and young child feeding (IYCF) practices during and after the illness. This typology is the easiest and least costly, and only requires updating training manuals and data collection forms.	In Malawi, iCCM CHWs counseled caregivers on care for children and provided oral rehydration salts (ORS), antibiotics, or antimalarials. Only 55% of caregivers of children with diarrhea received counseling on optimal IYCF and care, likely because this program was implemented nationwide [7]. In contrast, a similar program in Bangladesh implemented at smaller scale with strong supervision found 73% of caregivers received counseling on optimal IYCF and care practices [8]. In Democratic Republic of the Congo, iCCM protocols include nutrition home care advice on feeding and fluids for all sick children. However, it is unclear if CHWs are trained on and implementing these measures in villages.
<i>Typology 2. Linkages with social and behavior change communication (SBCC) activities on child nutrition</i>	
SBCC nutrition messages are provided by iCCM CHWs or another cadre of health workers through home visits, group sessions, media, or other channels.	Alive & Thrive: In Ethiopia, preventive nutrition messages and SBCC activities are delivered by health extension workers via home visits, group sessions, and media in the four most populated regions. In Bangladesh, BRAC frontline workers counseled mothers on optimal IYCF via home visits, group sessions, and media, which increased exclusive breastfeeding rates by 25% and doubled the percentage of children meeting minimum dietary diversity [9].

General Description	Country Implementation Examples
<i>Typology 3. Linkages between iCCM and acute malnutrition treatment through assessment and referral</i>	
Per standard UNICEF/World Health Organization protocol, CHWs measure every sick child under 6 months old with mid-upper arm circumference (MUAC) tape and assesses for bilateral pitting edema. Red MUAC and edema are danger signs, and CHWs refer children to the nearest health facility, in line with community-based management of acute malnutrition recommendations. Yellow MUAC treatment protocol is less defined, and CHWs should refer children to a feeding program nearby if one exists or counsel on complementary feeding. Some countries' CHWs use active screening or active case detection through routine growth monitoring or home visits.	In Niger, Red Cross volunteers were trained to actively screen children 37–59 months old for acute malnutrition via MUAC measurement and refer children with scores under 125 mm (orange or red zone) to their local health facility. This increased malnutrition case detection and referral by over four times between December 2013 and June 2014 [10]. Through the Rwandan Kabeho Mwana program, CHWs were trained to actively screen children for moderate acute malnutrition and severe acute malnutrition (SAM) using MUAC and weight-for-age (underweight) measurement, and refer such cases to respective health facility programs. This program helped to identify and treat over 8,000 SAM cases and raise awareness of the problem of malnutrition [11].
<i>Typology 4. Treatment of uncomplicated SAM at community level</i>	
CHWs evaluate, classify, treat, and follow home management of uncomplicated SAM. Complicated SAM cases are referred to the health facility for inpatient care. Sometimes community-based management of acute malnutrition protocols are also adapted to link another (second) community-based cadre of health personnel with responsibilities and skills to address acute malnutrition.	In southern Bangladesh, active SAM case-finding activities by CHWs (during growth monitoring visits and home visits) meant most children under 3 were screened monthly. This significantly improved malnourished children accessing treatment (coverage rate of 89%), SAM cases that recovered (92%), and relapse rate (7.5%) [8]. In southern Bangladesh, the addition of SAM management into the CHWs' repertoire led to three extra home visits per week (or 3–4 hours of time) without impacting the quality of care [8].

Adapted from Friedman and Wolfheim, 2014

In this global review of country experiences of nutrition interventions integrated into iCCM, the authors found integration was easiest during sick-child visits, yet a significant challenge remained in identifying which cadre of health worker should carry out nutrition-related social and behavior change activities and how these activities should be implemented (typology 1). For typology 2, skilled personnel conducted home visits, and formative research was used to define the local context with respect to knowledge, attitudes, and practices, and to design and disseminate preventive health education messages and social and behavior change activities. iCCM training materials from DRC do include disease prevention training, with prevention messaging focused on handwashing, EBF, avoidance of indoor air pollution, the treatment of bed nets, and indoor insecticide spraying [12]. No studies have been conducted on the implementation or effectiveness of this effort.

Globally, this review indicated that a gap in evidence exists for integrating nutrition into the iCCM platform. This study aims to contribute to filling this gap, focusing on strengthening integration of nutrition into iCCM in DRC. This study provides evidence and suggests ways for improving counseling and social and behavior change communication (SBCC) on IYCF practices and caring for sick children. It elucidates how various aspects of nutrition services within iCCM, and IYCF messaging and counseling, are delivered within the DRC health system and can be strengthened through the rollout of a nutrition-iCCM pilot.

Background on iCCM in DRC

DRC has high rates of child malnutrition and mortality, especially in remote rural areas. The iCCM strategy, an equity-based approach, can help combat both child illness and malnutrition, even considering the lack of trained health care workers, difficult access to health care due to geographic constraints (only 35% live within 5 kilometers of a health facility), and lack of security. The principal causes of childhood mortality in DRC are malaria, acute respiratory infections (ARIs), diarrheal diseases, and malnutrition. According to a recent Maternal and Child Health Integrated Program (MCHIP) [12] summary report on iCCM program implementation in DRC, in December 2005, the Ministry of Public Health (MOPH) initiated iCCM for childhood illness, which included treatment for malaria, ARIs, diarrhea, and malnutrition. In 2010, there were 716 iCCM sites covering a population estimated at more than 1.6 million. Currently (data from late 2017), after 12 years of sustained efforts, iCCM is implemented in 6,968 sites across 402 health zones (among 461 eligible). However, the quality and types of program approaches vary greatly by geographic area and partners' support and priorities, often leading to uneven and fragmented implementation. Generating evidence to inform and strengthen the integration of nutrition into iCCM can potentially provide great benefit in the context of Maternal and Child Survival Program (MCSP)-supported areas in DRC, which can be adapted, if successful, to other provinces in the country.

According to the 2014 MCHIP report [12], community-based care in DRC has gone through three phases:

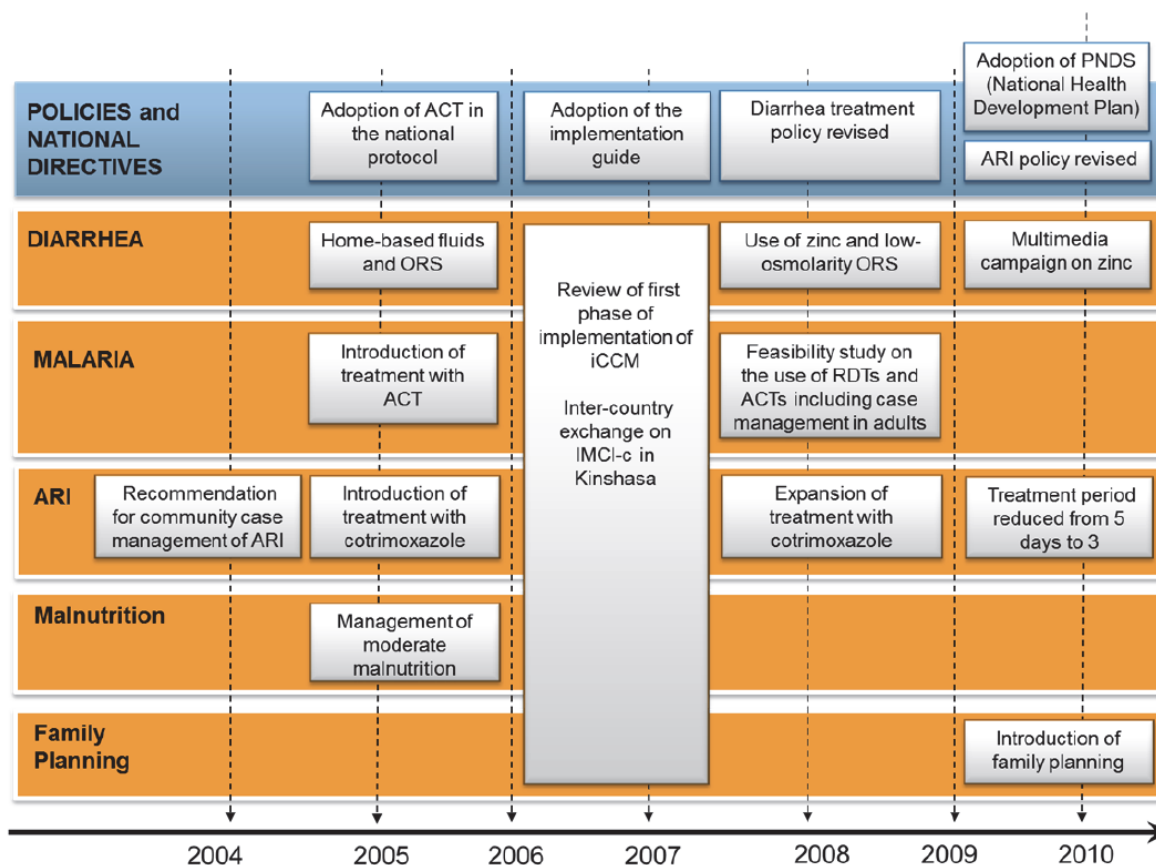
- Phase 1: The concept of providing health care through community-level workers dates as far back as the colonial era, but more recent roots for iCCM are found in DRC's primary health care strategy, initiated after the Alma-Ata Declaration was made at the International Conference on Primary Health Care in 1978. Unfortunately, progress on implementing the strategy came to a halt between 1990 and 2002, when conflict in the country deterred international cooperation.
- Phase 2: Implementation of the primary health care strategy continued after a transitional government was established in 2003. The 2003–2007 period included the following developments:
 - 2003: DRC's transitional government was established, and the MOPH began searching for up-to-date solutions to improve the health status of the population, including the use of community volunteers to fill gaps.
 - 2004: In October, findings from Senegal's community-based treatment of ARIs research created interest in and momentum for iCCM within the MOPH. Consensus meetings were held, and the decision was made to integrate the management of four diseases—malaria, diarrhea, ARIs, and malnutrition—into the iCCM package from the outset of implementation.
 - 2005: The MOPH secretary-general established a steering committee to be in charge of implementing the iCCM strategy, which developed an implementation plan, established scale-up criteria, and used the findings from field surveys to select the first sites for the launch.
 - 2006: In March, DRC representatives attend the Subregional Conference on Community Case Management of Pneumonia in Senegal and presented on their experience on the integrated approach. Subsequent iCCM sites were established in DRC.
 - 2007: Based on lessons learned from 2 years of field experiences, the MOPH finalized the implementation guide for establishing iCCM sites and prepared to scale up the strategy. By October, partners had trained 421 iCCM site relays and had 224 functioning iCCM sites.
- Phase 3: iCCM was expanded in DRC.
 - 2008: Scale-up began.
 - 2009: Churches were mobilized to disseminate key child health messages. Scale-up continued. By September, the iCCM strategy reached 10 of the 11 provinces and 78 of the 515 health zones.

- 2010: Family planning was added to the package of services, with pilots for community-based distribution of contraceptives launched in six health zones.
- 2016/2017: In 2016, a process to develop a National Strategic Plan for Child Health, covering the period 2016–2020, was launched by the MOPH with support from several partners, including WHO, UNICEF, and the United States Agency for International Development. The plan, which is in line with the National Health Development Plan for the same period, includes prevention and treatment of childhood illnesses and iCCM as a basic strategy to increase access to treatment of malaria, pneumonia, diarrhea, and malnutrition. The plan also harmonizes policies and guidelines on child health activities, which were previously in place but scattered across different technical departments of the MOPH (i.e., specific malaria, diarrhea, ARI, and nutrition programs).

An important part of the development of the iCCM approach in DRC was the major changes in policies and protocols instituted by the MOPH, illustrated in

Figure 1. For nutrition, the MCHIP report revealed that the iCCM strategy was not always implemented in line with WHO's protocol for the management of acute malnutrition. However, given the common objective of providing curative services, iCCM site CHWs (RECOs) were often called upon for treatment of cases of malnutrition. Other gaps are that the current iCCM strategy does not address preventive and curative aspects of nutrition, and clinical and community-based nutrition interventions are not sufficiently linked [13]. One of the challenges is newly integrating prevention components to ensure synergy between the curative and preventive aspects of iCCM.

Figure 1. Policies and protocols on integrated community case management in Democratic Republic of the Congo, 2004–2010



Study Aim and Objectives

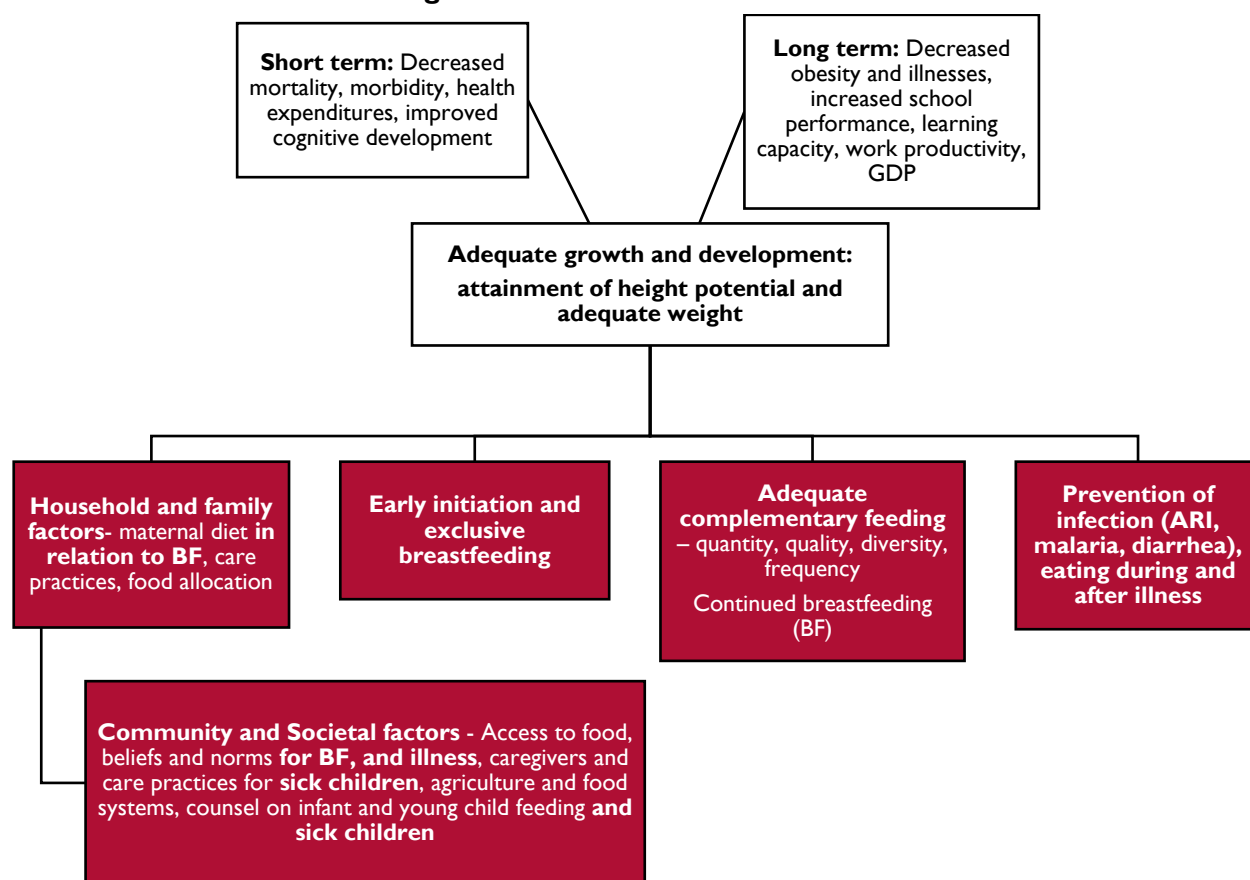
This formative research study aims to inform the design and implementation of MCSP program activities that integrate nutrition into the national MOPH iCCM program. The specific objectives of the study were to:

1. Examine cultural beliefs and perceptions of IYCF, child illness, and care-seeking behavior for sick children among women and families with children under 5.
2. Examine the perspectives and knowledge of health providers, including facility-based health providers and CHWs, who treat and provide counseling on nutrition and iCCM.
3. Gain an understanding of key influential family/community members' perspectives on providing advice on nutrition and health practices for children under 5.
4. Identify the gaps and opportunities for strengthening nutrition service delivery through the inclusion of preventive and curative nutrition aspects as part of iCCM at the community level alongside integrated management of childhood illness (IMCI) in health facilities, as feasible.

Study Design and Methods

The conceptual framework underlying this study is based on a modified conceptual framework on stunting (see Figure 2). This study shows that children's healthy growth and development derive from EBF for the first 6 months, continued breastfeeding to 2 years old, good complementary feeding practices, and other health behaviors. Following Kavle et al. 2014, the WHO model was adapted to provide a structured contextual approach to explore behaviors, perceptions, and cultural beliefs that impact optimal IYCF practices, and the roles of families, caregivers, and health providers [14]. Boxes shaded in gray reflect the data collected in this study. Bold-faced terms indicate topics that this study addressed.

Figure 2. Adapted from Kavle et al. 2014 and World Health Organization framework of factors associated with stunting



This mixed-methods study combines qualitative research methods (i.e., in-depth interviews [IDIs] and focus group discussions [FGDs]) with quantitative assessments of child nutritional status (anthropometry) and food frequency data to inform the design of activities to integrate nutrition into the iCCM program supported by MCSP in DRC. The study was conducted in the four health zones¹ of Bengamisa, Yakusu, Yaleko, and Ubundu in Tshopo Province,² where MCSP will be implementing the iCCM package (Figure 3). These health zones were selected to be representative of the differences in religion, ethnic groups, culture, and geography (river, forest) that impact nutrition and child health practices in this part of DRC. Ethical approval was obtained from the institutional review boards at John Snow Inc. and the Kinshasa School of Public Health in DRC.

¹ A health zone (in other countries, sometimes called a health district) is a geographic area managed by a small team of health professionals, directed by a physician, that covers a population of about 165,000 and has designated health facilities and usually one referral hospital.

² New administrative division based on January 2015 law passed by DRC's National Assembly.

Figure 3. Map of Democratic Republic of the Congo's Tshopo Province



Data collection took place from January to March 2017, with approximately 5 days of data collection at each site. Sample sizes were chosen to adequately capture the range of cultural beliefs and perceptions on nutrition and child health practices across health zones in Tshopo Province, DRC (Table 3). IDIs of mothers, fathers, and grandmothers of children under 5 were conducted to determine beliefs and perceptions regarding IYCF, child illness, and care-seeking behaviors. These interviews usually took place in or around the participants' homes. Mothers were stratified into three groups, with eight to 12 mothers of children ages 0–5 months, 6–23 months, and 24–59 months old per group. Mothers, grandmothers, and fathers were included if they were residents of selected study sites and played a role in the feeding and care of a child. The index child did not have a known chronic illness, including HIV, or a disability that would markedly affect normal feeding and care practices. Nonresidents of the selected study sites in Tshopo Province were excluded, as were participants who were outside the following age ranges: mothers 15 and older, grandmothers 38 and older, and fathers 18 and older. Interviews with mothers lasted approximately 2 hours, whereas those with grandmothers and fathers lasted approximately 45 minutes and took place in a private space in or near the home.

Table 3. Overview of data collection methods and sampling, Tshopo Province, Democratic Republic of the Congo

Data Collection Methodology	Number of Respondents	Sampling
In-depth interviews (IDIs) with mothers of children under 5, which included food frequency and anthropometric measurements (weight, length/height, mid-upper arm circumference)	n=48	Approximately one-third of mothers had children 0–5 months, one-third had children 6–23 months, and one-third had children 24–59 months. Included households from villages of various socioeconomic status, those who use health facilities and those who do not, married and unmarried households, and adolescent mothers (ages 15–18) identified using purposive sampling.
IDIs with grandmothers of children under 5	n=20	Linked to mothers of children under 5 participating in IDIs. These maternal and paternal grandmothers (i.e., mothers of mothers and mothers-in-law) were from the same households as mothers in #1 when possible.
IDIs with fathers of children under 5	n=21	Mix of fathers with children 0–5 months and 6–59 months identified using purposive sampling. Not linked to female interview participants. Range of wealth status, both those who use services at the health facility and those who do not, married with one wife or multiple wives (polygamous).
IDIs with facility-based providers of nutrition and child health services	n=18	IDIs with purposively identified facility-based providers (i.e., nurses, doctors) offering nutrition and child health services in health centers or health posts that are public (i.e., government) or private (e.g., mission).
Focus group discussions (FGDs) with <i>relais communautaires</i> (community health workers, or RECOs)	n=8 FGDs n=56 RECOs	Purposively identified mix of RECOs who provide counseling on nutrition and those who provide treatment for iCCM, including male and some female RECOs (most RECOs are male).
IDIs with traditional healers	n=20 healers	Traditional healers identified via members of each community.

IDIs with mothers of children 0–59 months included additional data collection to assess children’s diet and nutritional status. In addition to the IDI, mothers participated in a food frequency questionnaire that asked about the foods eaten by their child(ren) on a daily, weekly, and monthly basis. Anthropometric measurements, including weight, length (for children under 24 months), or standing height (for children older than 24 months), and MUAC (for children under 5) were measured and recorded for all children of interviewed mothers. Nutritional status was categorized by anthropometric measures of stunting under -2 standard deviation (SD) height for age, wasting under -2 SD weight for height, underweight under -2 SD weight for age, and overweight (over +2 SD) and obese (over +3 SD), computed using the WHO International Growth Reference Curves [15].

IDIs were carried out with facility-based health providers (i.e., nurses, doctors) and traditional healers. FGDs were conducted with RECOs who provide counseling or treatment for iCCM (relais promotionnels or RECO sites,³ respectively). Topics included the quality and content of IYCF and iCCM counseling; treatment(s) administered for child illness; level of knowledge; and advice given to mothers and families on child illness, IYCF, and care practices. IDIs and FGDs took place at primary health care facilities or occasionally at the village school or church. Health providers were included in the study if they worked within Tshopo Province at MCSP-supported health facilities (public or private), and provided nutrition and/or child health services. Both RECO sites and relais promotionnels were included if they worked at MCSP-supported sites in Tshopo Province. Traditional healers were invited to participate if they worked within Tshopo Province in MCSP-supported and targeted health zones, and provided nutrition and child health advice, counseling, or treatment. Individual interviews lasted approximately 1 hour, whereas FGDs lasted approximately 2 hours. Study personnel were trained on maintaining confidentiality of the discussion and not disclosing names.

Local researchers had previous training in the field of public health and were also trained on research ethics, informed consent, privacy/confidentiality, key techniques related to qualitative data collection, and data storage. They also participated in pre-testing and adapting the qualitative and quantitative study tools. Before beginning data collection, the study team received permission from local government authorities in Kisangani (Divisions Provinciales de la Santé [provincial health divisions, or DPSs] and local representatives of Programme National de Nutrition [DRC national nutrition program, or PRONANUT]) and village chiefs from study communities. In each community where data collection took place, community sensitizations were organized 2 days before to inform local authorities on the study objectives and procedures, and to allow the community to name local guides, who worked with study coordinators to establish a list of potential interviewees according to the selection criteria outlined above.

Verbal informed consent was obtained from all participants before participation in IDIs and FGDs. Participants were also provided with a copy of the consent form (in French, Swahili, or Lingala), describing elements of informed consent included in Title 21 of the Code of Federal Regulations, Part 50.25 (Protection of Human Subjects, Informed Consent of Human Subjects, Elements of Informed Consent), and the risks or discomforts to the participant that were identified as reasonably foreseeable. For participants 18 and under, assent is not needed in DRC, but by age 15, women meet the local definition of “adults” if they are currently parents of children. IDIs and FGDs were conducted in locations that provided auditory privacy, recorded in local languages (i.e., Swahili, Lingala), and transcribed into French.

These qualitative and quantitative data collection methodologies were used to gain an understanding of the following topics at community and health facility levels:

- Knowledge, perceptions, and cultural beliefs related to IYCF, child health, and illness
- Motivators and barriers to IYCF practices
- Care-seeking patterns for nutrition and child health services (specifically for children under 5)
- Service provider counseling practices, including beliefs/biases
- Service delivery processes

Data were analyzed iteratively and collaboratively by Bukavu, Kisangani-based study coordinators, Washington, DC-based principal investigators, and remote qualitative research consultants.

³ A *relais communautaire* (also called a RECO) is a volunteer from a village or street, appointed by the residents of said village or street to ensure the link between individual family members and the health service. RECOs agree to devote part of their time to community interest activities to contribute to the development goals of their village/street in a sustainable way (source: MCHIP 2014).

First, preliminary analyses of IDIs and FGDs were conducted to identify dominant themes and develop a coding structure. After multiple iterations, a codebook was established consisting of 35 codes grouped around the following categories:

- Background on foods
- Child feeding behaviors
- Community perceptions about child health, nutrition, and illness
- Care-seeking behaviors
- Roles in provision of services for child health and nutrition (Annex 1)

Qualitative analysis of transcripts was then carried out using NVivo 11 [16] to explore themes, such as respondents' knowledge, perceptions, and practices, and the barriers and motivators for optimal nutrition and child health practices. Questions and clarifications were sought from the local research team as necessary. Findings were then used to contextualize quantitative data obtained via the food frequency questionnaires and anthropometric measurements.

Descriptive characteristics of family members (mothers, fathers, and grandmothers) are provided in Table 4 and of health personnel in Table 5. Overall, mothers (n=48) ranged in age from 16–42, with the youngest mothers on average found in Bengamisa (average age of 23 compared to 26 overall). Most mothers (65%, n=31) had a primary school education, and the vast majority worked as farmers. The greatest proportion of mothers (50%, n=24) had between three and five children, with nearly one-third having one to two children (31%, n=15) and a minority having more than five (19%, n=9). Fathers (n=21) were on average much older, with an average age of 36 and a range of 22–59, and were more likely to have at least a secondary school education (62%, n=13), though most were also farmers. Like mothers, they were most likely to have three to five children (48%, n=10), but unlike mothers, their index child was unlikely to be under 6 months (only one father had a child this age). Finally, the average age of grandmothers (n=20) was 54 (range: 45–63), although seven grandmothers were unable to state their age and are not included in summary statistics on age. Grandmothers all practiced farming and had either no education (45%, n=9) or primary education (55%, n=11). Their index grandchildren were more often boys than girls (70%, n=14 boys) of older ages (55%, or n=11, were 24–59 months). Less information was collected about health personnel to preserve anonymity. The largest number of respondents among health personnel were RECOs (n=56), who participated in FGDs with six to eight participants each. Smaller numbers of traditional healers (n=20), nurses (n=15), doctors (n=2), and other health personnel (n=1) were engaged via IDIs.

Interviews were conducted during the dry period (February–March 2017), not when families work the fields after planting (November–January) and before harvest (June–September). While this was not the most intense period in terms of villagers' activity, it was also not a rest period, as villagers fished or engaged in other activities when they were not cultivating crops. The main crops cultivated were cassava, plantain, rice, maize (except in Yaleko), sweet potato, peanuts (except in Yakusu), and palm oil. Women tended to be the main farmers and, in most cases, gave up their time in the field to participate in interviews. Among the four sites included in this study, there were a few differences in dietary patterns by study location. The diet primarily consisted of starchy staple foods (kwanga, lituma, fufu) made from local tubers and other starches (cassava, plantain, maize), often served with beans (vigna); animal sources of protein, including bush animals or fish; and green, leafy vegetables, such as *sombé* (cassava leaves) or *matembela* (sweet potato leaves) as part of the basic meal. Local practices with respect to nutrition, feeding, care seeking, and other topics considered in this report were also similar. All sites had community care sites,⁴ as this was a criterion for their inclusion in the study.

⁴ *Sites de soins communautaires* (community care sites, or SSCs) are small village centers staffed by RECO sites who are trained to diagnose and treat malaria, diarrhea, and pneumonia; detect malnutrition; and promote key family practices. SSCs were found in 446 of 516 health zones in 2015, but only 105 SSCs offered promotion of key family practices (source: WHO 2016).

Preliminary results were presented at workshops bringing together national stakeholders in Kinshasa and provincial stakeholders in Kisangani (November and December 2017). Attendees were given a chance to question, interpret, and critique the preliminary findings, as well as extrapolate their implications for the programmatic objective of improving integration of nutrition into iCCM. Analysis emanating from these workshops mainly confirmed and enhanced the interpretation of emerging findings; the recommendations provided form the basis of the recommendations in this report, which aim to translate results in practical approaches for strengthening integration of nutrition into iCCM programming.

Table 4. Descriptive characteristics of participants by site (family members)

Index Child Sex			Index Child Age (mos.)			Avg. Age (Range)	Total Number of Children			Highest Level of Education Obtained			Common Professions
	M	F	0–5	6–23	24–59		1–2	3–5	>5	< Primary	Primary	Second. +	
<i>Mothers</i>													
Bengamisa (n=12)	4	8	4	4	4	23 (16–30)	6	5	1	1	10	1	Farmer
Ubundu (n=12)	8	4	4	4	4	27 (19–37)	3	7	2	1	6	5	Farmer, student
Yakusu (n=12)	7	5	4	4	4	27 (18–42)	2	6	4	1	9	2	Farmer, small trade
Yaleko (n=12)	6	6	4	4	4	25 (16–39)	4	6	2	0	6	6	Farmer
TOTAL (n=48)	25	23	16	16	16	26 (16–42)	15	24	9	3	31	14	--
<i>Fathers</i>													
Bengamisa (n=5)	2	3	0	4	1	28 (22–37)	2	2	1	0	1	4	Farmer, student
Ubundu (n=5)	4	1	0	2	3	43 (32–59)	0	1	4	0	4	1	Farmer, local chief
Yakusu (n=5)	2	3	1	2	2	41 (25–53)	1	2	2	0	2	3*	Farmer
Yaleko (n=6)	2	4	0	2	4	31 (22–44)	1	5	0	0	1	5	Farmer, driver
TOTAL (n=21)	10	11	1	10	10	36 (22–59)	4	10	7	0	8	13	--
<i>Grandmothers</i>													
Bengamisa (n=5)	4	1	1	0	4	55 (49–58)	--	--	--	4	1	0	Farmer
Ubundu (n=5)	4	1	0	2	3	56 (49–61)	--	--	--	1	4	0	Farmer
Yakusu (n=5)	2	3	1	1	3	49 (45–53)	--	--	--	2	3	0	Farmer
Yaleko (n=5)	4	1	1	3	1	54 (49–63)	--	--	--	2	3	0	Farmer
TOTAL (n=20)	14	6	3	6	11	54 (45–63)†	--	--	--	9	11	0	--

* One father had a graduate education. † Seven grandmothers did not know their age and are not included in averages.

Table 5. Study participants: health providers (by type and by site)

Site	In-Depth Interviews				Focus Group Discussions (FGDs)
	Nurse	Doctor	Traditional healer	Other*	CHWs
Bengamisa (n=24)	5	0	5	0	2 FGDs 14 participants
Ubundu (n=24)	2	1	5	1	2 FGDs 15 participants
Yakusu (n=23)	4	1	5	0	2 FGDs 13 participants
Yaleko (n=23)	4	0	5	0	2 FGDs 14 participants
TOTAL	15	2	20	1	8 FGDs 56 participants

*Including medical receptionist

Results

Community Perceptions of Child Health, Growth, and Well-Nourishment

According to respondents in the community, including family members and traditional healers, the concepts of children's health, growth, and nutrition are strongly linked and difficult to separate. Family members were often unable to distinguish between a healthy child and a well-nourished child, and connected healthy growth, appetite, and good nutrition into a single category and semantic field. They were usually unable to distinguish among these categories when pressed by interviewers; as one father from Yaleko said, "According to me, if [the child] has good health, then that will bring him good growth." Eating well and/or having a good appetite is considered the first symptom of good health, with other symptoms including not sick/sickly, recovers quickly from illness, breastfeeds often, has a good appetite, sleeps well, plays, walks, appears clean, etc. (see Box 1 below).

"The sign of a child who is in good health is first of all his/ her good diet (bonne alimentation). If s/he eats correctly, then s/he will grow up with good health." – Father

Community perceptions of child illness are also linked to poor growth and poor nutrition. "A child who is not growing well, that is to say who's sick, whereas if he's in good health, he can grow well," one mother from Yaleko summarized. Other community members agreed, notably focusing on the link among appetite, good nutrition, and health:

"The signs of bad growth, it's that the child doesn't have an appetite." – Mother, Bengamisa

"[A child] cannot refuse food if he isn't sick." – Father, Bengamisa

"If a child refuses to breastfeed, it can only be due to illness." – Traditional healer, Yaleko

The most commonly cited symptom of illness in children was loss of appetite, followed by a change in coloring of skin and/or hair. Other symptoms of poor health cited by families were merely the opposite of the symptoms of good health mentioned above, meaning *not* eating well, *not* sleeping well, *not* playing, *not* being clean or going to school, etc. RECOs shared the same perceptions; one RECO from Ubundu speaking about his own child said, "One day, I noticed my child was not eating well and he had even changed complexion, so I asked myself, 'What kind of disease could it be?'" Community members also said that illness could be recognized in children when they are "sickly" or show poor growth. However, eating well (i.e., having a good appetite) was perhaps the most frequently mentioned symptom of good health among children, and not eating well was a symptom of poor health.

Family and community members, who were asked about children's "poor growth," mentioned recognizing clinical symptoms of acute malnutrition. Clinical symptoms of SAM—often referred to as kwashiorkor, locally defined as a severe form of malnutrition, caused by lack of food or neglect of children or "lack of blood"/anemia—were mentioned by many interviewees (five mothers, five grandmothers, and four fathers). Kwashiorkor is formally defined as a type of protein energy malnutrition characterized by clinical signs such as edema, anorexia, irritability, skin pigmentation/dyscoloration, and discolored/thin hair [17, 18]. In line with the formal definition of clinical acute malnutrition (kwashiorkor), community members relayed that

Box 1. Ways communities recognize a healthy child:

- Has a good appetite.
- Breastfeeds often.
- Sleeps well.
- Plays/walks around.
- Is "clean" or "healthy" in appearance (well dressed, with cut nails and clean teeth).
- Is same size as other children the same age.
- Is not sick/sickly.
- Recovers quickly from illness.
- Is smart/well raised/good in school.
- Is respectful of his/her elders.

kwashiorkor occurred when the child did not have enough to eat and experienced bad growth, and described its symptoms (distended belly, discolored hair, swelling, etc.):

“When the child is hungry/starving, he will cry a lot and his body changes. He’ll get kwashiorkor.”
– Grandmother, Ubundu

“The sign of bad growth is when a child hasn’t eaten well; that’s a bad sign. He’ll have kwashiorkor because of this bad sign.”
– Father, Bengamisa

Thus, community members, including family members and traditional healers, seem to have integrated the medical term kwashiorkor into local languages and do recognize it as a troubling symptom of malnutrition (or poor growth). Acute malnutrition was most often associated with another illness. As it is a rare occurrence, parents who said their own child has or had SAM said it followed on from another illness. Families also sometimes spoke of their children as having a “lack of blood,” signifying anemia:

“The sign of poor growth, you see the child get thinner and his feed and face swell, you’ll see the blood reduce [le sang diminuer]. Those are the signs of poor growth.” – Mother, Ubundu

On the other hand, less severe forms of malnutrition (i.e., stunting) were not discussed and potentially not recognized by families and communities. This may be because stunting was quite common among children in the community, and families tended to measure their children’s growth by comparing their size to other children of the same age, thus a stunted child would not look small in a cohort where stunting was common. According to anthropometric measurements of children in the sample (Table 6), levels of stunting were high in this study. Of the 47 children measured, 18 (38%) met the WHO criteria for stunting. Additionally, 17% of children in the sample met the criteria for underweight, 4% for wasting, and 3% and 6% were suffered from MAM and SAM, respectively, as measured using MUAC. However, respondents in the study tended to refer to childhood malnutrition only as “poor diet” or “poor appetite” as a symptom of some other illness, or to more severe, visible forms of malnutrition, such as *kwashiorkor*. *Kwashiorkor* was seen as a shameful condition due to family neglect (particularly on behalf of the mother):

“Here in our community, if you see a child with these signs [reddish hair, swollen cheeks and feet, pale skin], we call it kwashiorkor. The child has difficulty eating. Nobody is taking care of him, there’s a sloppiness in the middle, he eats food at unplanned times, sometimes the mother goes off into the forest until very late.” – Father, Bengamisa

This topic of neglect is further discussed below in the section on Care Seeking for Childhood Illness.

Table 6. Anthropometric data for children 0–59 months*

Measure of Nutritional Status	N (Percentage) of Children Meeting Criteria
Stunting (≥ 2 standard deviations under the World Health Organization [WHO] reference of height for age)	18/47 (38)
Underweight (≥ 2 standard deviations under the WHO reference of weight for age)	8/48 (17)
Wasting (≥ 2 standard deviations under the WHO reference of weight for height)	2/46 (4)
Moderate acute malnutrition* (MUAC = 115–124.9 mm)	1/32 (3)
Severe acute malnutrition* (MUAC < 115 mm)	2/32 (6)

* Measured using mid-upper arm circumference (MUAC) in children 6–59 months.

Study team members said interviewees perceived that SAM and even lesser forms of malnutrition, characterized as poor growth, were considered shameful—an indicator of poverty and/or neglect of children by families. There were occasional references to this in IDIs and FGDs:

Interviewer: “*What can you do if a malnourished child comes to you?*” [Following a discussion of children who have “poor growth,” who are weak, etc.]

Traditional healer, Ubundu: “[*Children*] *presenting these signs are good children neglected by their parents.*”

Childhood illness can take many forms: “white man’s” diseases, such as pneumonia and malaria, and many local illnesses that can have organic and spiritual causes.⁵ Interviewers asked respondents about the following “Western” (white man’s) illnesses: diarrhea, malaria, fever, cough, and malnutrition, which respondents all affirmed were present in their communities, alongside many local illnesses (Table 7). All categories of respondents identified Western diseases and local illnesses, but facility-based health providers characterized local illnesses more as cultural beliefs than as objectively existing phenomena. Sometimes Western diseases could be perceived as symptoms of other local illnesses, such as cough as a symptom of *Fota itoko*:

“*He coughed when it was sick, and since he’s sick, we’ll do Fota itoko. That is to say, when the child coughs, we rely on our traditional products and give him a purge (enema).*” – Father, Bengamisa

Among the local illnesses, several of the most common illnesses were transmitted from the mother to the child via breastfeeding. Illnesses linked to/thought to be caused by breastfeeding include *Fota itoko*, a febrile syndrome caused by foods eaten by the mother when breastfeeding; *kunde*, defined as a disease of the mother’s genitals and breasts transmissible to the child during breastfeeding; and *sanga*, a condition when a breastfeeding mother becomes pregnant and the breastfed infant may become malnourished, have diarrhea, or may not be able to walk until the mother gives birth. An additional set of local illnesses describes different types of respiratory troubles in young children, including *kafeké*, which presents as respiratory difficulties associated with cough and fever, and chest disease, compression in the child’s chest with localized swelling, causing a failure to gain weight. A final illness of note is *lonyama*, which leads to convulsions and loss of consciousness. There were differing perceptions about which illnesses should be treated with Western or traditional medicines, a topic that is discussed below in the section on Care Seeking for Childhood Illness.

⁵ “Western” illnesses refers to objectively measurable pathological conditions of the body recognized by biomedicine. In contrast, local illness refers to a feeling of not being normal or healthy, which can be caused by a disease or pathology but can also have spiritual origins. For more information on the difference between these terms, see this tutorial from the Behavioral Sciences Department at Palomar College: https://www2.palomar.edu/anthro/medical/med_1.htm

Table 7. Selected local diseases mentioned by respondents

Name	Description	Mentioned By
<i>Fota itoko</i>	Febrile syndrome with or without skin rash, anal fissure, or diarrhea. Believed to be caused by certain foods eaten by mothers while breastfeeding.	Mothers (n=10), fathers (n=7), grandmothers (n=4), traditional healers (n=3), RECO (n=1)
<i>Kunde</i>	A disease of the breast, causing pain and requiring massage. May present as genital ulcers in the form of warts found in the mother. This disease can be transmitted to the child during breastfeeding.	Mothers (n=6), fathers (n=2), grandmothers (n=2), traditional healers (n=4), RECOs (n=2), nurse (n=1)
<i>Zala na Mbangukamba</i>	Stomach troubles in small children. Recognizable when the child defecates, as the fecal matter contains a long white thread.	Mother (n=1), father (n=1), traditional healers (n=3)
<i>Lonyama</i>	Myoclonic contractions in the children associated with loss of consciousness, convulsions, and trembling in arms and legs.	Father (n=1), doctor (n=1), traditional healer (n=2)
<i>Kafeke</i>	Respiratory difficulties associated with cough and fever.	Grandmothers (n=2), fathers (n=2), RECO (n=1), traditional healer (n=1)
<i>Bibon</i>	Abscess, or appearance of a painful mass on any part of the body, often associated with fever.	RECO (n=1), traditional healer (n=1)
<i>"Diminution du sang"</i>	Anemia, paleness, fatigue. At advanced stages, difficulty breathing due to low levels of hemoglobin.	Mothers (n=2), nurse (n=1)
<i>Makenge</i>	Swelling of parotid glands.	Mothers (n=4), father (n=1), grandmothers (n=2)
<i>Sanga</i>	A condition when a breastfeeding mother becomes pregnant and the breastfed infant may become malnourished, have diarrhea, or may not be able to walk until the mother gives birth. This condition can negatively affect the quality of the breastmilk.	Mothers (n=1), grandmother (n=1), RECO (n=1), traditional healer (n=1)
<i>Lame</i>	Small swelling in the throat.	Mothers (n=2), father (n=1), traditional healers (n=3)
<i>"Maladie de la poitrine"</i>	Compression in the child's chest with localized swelling. The child eats but does not gain weight. If the illness is not treated, it attacks the child's backbone, sometimes leading to handicap. Often occurs during weaning.	Grandmothers (n=1), fathers (n=2), mother (n=1); RECO (n=1), traditional healers (n=2)

Exclusive Breastfeeding and Early Introduction of Foods

Most women said they proceeded with early initiation of breastfeeding, but it was difficult to ascertain timing of initiation and whether breastfeeding commenced within 1 hour of birth. Those few women who did not perform early initiation of breastfeeding mentioned the following reasons for delaying initiation:

- The baby was sleeping.
- The health worker moved the baby to a different room than the mother.
- The baby did not cry and therefore was not ready to nurse. (*"I gave birth to the child at 6 a.m., and I gave him the breast the same day at 4 p.m. because he wasn't crying."* – Mother, Yakusu)
- The mother was in pain after giving birth. (*"After giving birth, I had pains in my stomach ... There wasn't any way I could breastfeed."* – Mother, Yakusu)
- The breastmilk was not coming out.

Among women who did not give the breast in the hour following childbirth, the fact that the child was not crying was the most frequently cited reason. Conversely, crying indicated hunger in infants. Nevertheless, in general, mothers tended to follow the advice of health workers to initiate breastfeeding and indicated that health providers had an influential role in advising on the newborn's feeding.

Interviewer: How do you know she has a lot [of milk]?

Father from Yakusu: She eats well and the child is in good health.

Interviewer: Uh-huh. And how is the quality of the milk?

Father: It's white milk of very good quality.

Nearly all mothers said it was important to give infants colostrum. Most women said they gave the infant colostrum because the health worker told them to do so, but they could not describe the importance and benefits of giving colostrum to their infant. As one woman from Ubundu tried to explain: "Um, it's because, well ... I don't really have clear information, but I've heard that it contains vitamins." A minority of women said they did not give colostrum because it was "poor-quality" breastmilk that "wasn't clean." Nonetheless, there did not appear to be any overarching taboos or cultural barriers to giving colostrum, and few women said they were opposed to the practice. Fathers and grandmother do not appear to have been asked about the importance of giving colostrum. No specific instances of prelacteal feeding were reported in the data.

In general, all types of respondents, caregivers, family members, and health workers were supportive of mothers breastfeeding, describing it as a healthy, natural practice. Mothers, fathers, and grandmothers all affirmed the importance of EBF until 6 months, and mothers often said they were specifically instructed to do so by health workers at the hospital:

"They taught us at the hospital to breastfeed the child for 6 months, and that the child shouldn't drink water and should exclusively drink mother's milk." – Mother, Bengamisa.

As one RECO from Yaleko put it, *"It's [the child's] food, and s/he mustn't eat any other food for 6 months."*

Interviewer: The first milk that comes out, what did you do with it?

Mother of child 0–5 months, Bengamisa: So that it became good quality? I took some alcohol.

Interviewer: And it changed. You didn't throw it out?

Mother: [Yes, I did.]

Interviewer: Why did you drink the alcohol?

Mother: To make the milk clean.

Nonetheless, kunde and other illnesses were said to cause breastfeeding to be painful, with swollen breasts and sores on the breasts, and to negatively affect the quality of the breastmilk. Here, a RECO explains kunde and provides a description of its treatment during an FGD:

“Kunde blocks the breastmilk from coming out ... and sometimes make it comes out like water of a very white color. Or sometimes the milk isn't light and comes out in strings. These cases need to be treated so as to produce high-quality milk to feed the child [Kunde is treated] only with traditional medicine. ... It's up to traditional medicine to make milk come out if there's not enough—all you need to do is drink our 'bakeke' tea ... Here mothers drink it with plantains prepared with sombé.” – RECO, Yaleko

Kunde is treated sometimes by drinking Cowbell milk, but mainly care is sought for this illness among traditional healers. Because kunde is reported to affect only one breast at a time, mothers often continue breastfeeding with the breast perceived as “healthy” until the other non-healthy breast has healed.

Respondents had differing perceptions on the quantity of breastmilk and which factors affect quantity in breastfeeding mothers. Some respondents said that there was no problem with the quantity of breastmilk, as one could tell from the large, swollen breasts of breastfeeding mothers. However, many respondents said that mothers did have problems producing enough breastmilk to feed their infants, and that this problem was due to the fact that mothers did not eat enough themselves (due to poverty):

“Life has become expensive—there's no longer the means to eat well so as to breastfeed the child. Because if the mother eats well, then the child eats well.” – RECO, Yakusu

This perception of lack of breastmilk was a frequent cause of the early introduction of foods:

“First of all, mothers lack enough food to eat, and when the mother is hungry, the milk doesn't come out and the child disturbs you [with its crying]. The mother thinks the best thing to do is to add bouillie [to the child's diet], even if it's not yet time.”
– RECO, Bengamisa

“When they go in to weigh the child at the hospital, it's recommended to them to feed the child with mother's milk until the sixth month, at which point you can add bouillie to his diet. But with the suffering we have in life here, we don't respect that because the child won't stop crying, so we decide to give him food, which calms him down, so we conclude that he was crying from hunger.” – Father, Yakusu

Mothers who mentioned reductions in the amount of breastmilk often sought treatment from traditional healers, who are considered local experts and/or resources on kunde and related diseases of the breast having to do with breastfeeding. Other than that, mothers can try to improve breastmilk production by changing their own diet. Sombé (a dish mainly composed of cooked cassava leaves with oil) was often cited as a good food for mothers, with a beneficial effect on their breastmilk production. Nevertheless, the problem of mothers not having enough to eat themselves was a difficult one to overcome.

Mothers also discussed their perceptions that breastmilk can be suboptimal in quality. The main causes of poor-quality breastmilk, as relayed by mothers, were waiting too long between breastfeeding sessions, maternal illness, and maternal dietary consumption of certain foods thought to affect breastmilk quality. Although some mothers stated that they “ate everything that was available,” many other mothers and community members said certain foods were to be avoided to prevent infecting the breastmilk and causing diarrhea in the children. Foods that were mentioned as taboo for breastfeeding mothers included game meat (snake, monkey, crocodile), sugarcane, pineapple, mango, and sweet potato leaves. Mothers generally conveyed they would not consume these foods, given the perception of deteriorating the quality of the breastmilk and provoking diarrhea in the child. Mothers were also advised to avoid bad (i.e., unclean) water because it could cause diarrhea in the breastfeeding child.

The main indication that breastmilk was of poor quality was that it caused diarrhea in the child or was “watery” in consistency, whereas with “good” (high-quality), “thick” breastmilk, mothers breastfed on demand, though estimates on frequency seemed vague and unreliable.

“Breastmilk that’s infected provokes diarrhea—you can look elsewhere for the cause if you’re not prudent and examine the breastmilk.” – RECO, Ubundu

If children got diarrhea, mothers checked their diets and stopped eating any taboo foods, but they continued breastfeeding the child without interruption.

Many respondents also said the quality of breastmilk could be reduced if mothers did not breastfeed often enough (usually because they left to work in the fields). Poor-quality breastmilk could then, as expected, lead to diarrhea in the child:

“When you leave a lot of time between feedings, at that time, the [breast] milk becomes water. That’s why I tell her that she needs to come back a bit earlier from the fields to feed the child while the milk is still of good quality.” – Father, Yaleko

“You’ll see that when a mother breastfeeds her child, she gives the priority to her work, she leaves the child behind and goes off to work. She’ll come to feed her child very late, whereas the time is long since passed, and when the child breastfeeds, he’ll get diarrhea.” – RECO, Yaleko

“If you let too much time pass without nursing an infant, for example between 6 a.m. and 6 p.m., if he nurses again at 7 p.m., the child will get diarrhea.” – Traditional healer, Bengamisa

Furthermore, respondents sometimes mentioned “sweat from the fields” (la sueur des champs) as something unhealthy for infants and said the woman should wash her breasts before feeding the child.

The frequent necessity for mothers to leave the child to work in the fields caused a dilemma: The family needed enough food for her to eat well so as to provide enough breastmilk for the child, but leaving the child for long periods to cultivate the fields resulted in poor-quality breastmilk. Mothers dealt with this challenge in different ways. Some stayed home from the fields in the months after childbirth, particularly if they possessed a social network that could help with household tasks while the mother breastfed and rested. Others took their infants to the field or tried to return home early to breastfeed. Many mothers appear to have left their infants at home while they worked, trusting a grandparent or older sibling to feed the child (with *bonillie* or other foods).

Few if any mothers appear to have their infants breastfed by other breastfeeding women—the only time this practice was mentioned occurred when the mother physically could not breastfeed (was ill or had no breastmilk), but not because of the necessity of working in the field. There appeared to be quite a bit of stigma around wet nurses, particularly from healers in Western and traditional medicine:

“When you give birth at the hospital, the health workers don’t like it ... when another woman comes to nurse the child, they say you [the mother] should be the only one to give milk.” – Mother of child 24–59 months, Yakusu

“The doctors say that no one else should give the breast to your child, except yourself.”
– Mother of child 0–5 months, Yakusu

“For mothers who come [to me], the advice is ... give [the child] your breast to nurse. But not the milk of another woman, nursing from another woman makes the child sick with stomachaches, you don’t know what this other mother has and your child just nursed at her breast—automatically the child is contaminated by this illness.” – Traditional healer, Yakusu



Photo by Kate Holt, MCSP.

The mothers' need to return to field work was stated as the primary reason for early introduction of foods before 6 months, as mothers were absent for long periods and other family members fed the child soft foods to soothe its cries of hunger:

"When the mom is in the field, she's obliged to leave the baby with her big sister and tell the sister to give something like bouillie to calm the child until she returns." – Doctor, Ubundu

The early introduction of foods (before 6 months of age) is often seen as a means to provide sufficient nourishment to the child (e.g., to prevent anemia) if the mother's breastmilk is not perceived to be of good quality:

"If the mother knows that her breasts are not in good health and able to furnish the child with breastmilk, she is obliged to associate liquid foods so that the child doesn't become anemic." – Traditional healer, Bengamisa

"Where we live, it depends on the mother. If she thinks there's enough milk or isn't enough, she'll add something else." – Traditional healer, Yaleko

The most commonly introduced first food was bouillie, which is locally defined as a thin, watery term for porridge prepared with palm oil and flour of soy, plantain, cassava, or corn, or occasionally biscuits (cookies), as well as variable amounts of sugar. It is introduced in small amounts "bit by bit" between 3 and 6 months old:

"Here, the first food is bouillie. We give the child bouillie made of biscuits (cookies) to give that good taste that he'll like to eat. If you can't find biscuits, you can make it out of corn, even out of cassava." – Father, Bengamisa

Occasionally, other foods, such as biscuits, water, tea, and Cowbell, are introduced before 6 months, but bouillie is by far the most common food given to infants. Many informants did not consider bouillie a “food,” given that it is often a thin, watery porridge and described giving it much earlier than other things:

“[The child] started eating bouillie at 6 months and started eating food at 7 months.”

– Mother of child 6–23 months, Ubundu

“At 2 months, I started giving him bouillie, but it was when he was 7 or 8 months that I gave him other foods to eat.”

– Mother of child 24–59 months, Ubundu

“[Bouillie] satisfied him, just as we mothers do, when he’s 4 months old, you start to give him food. If he starts to cry a lot, it means that mother’s milk isn’t enough for him anymore, so you give him bouillie to drink.”

– Mother of child 6–23 months, Bengamisa

Continued Breastfeeding and Complementary Feeding

Decisions about continued breastfeeding and complementary feeding are strongly linked to the mother’s fertility and economic situation, specifically whether she gets pregnant again and her need to return to the fields to work. Ideally, mothers said they wished to continue breastfeeding until their child was at least 2 years old or even older. Mothers were often in no rush to stop:

Interviewer: *Until what age will you breastfeed her?*

Mother of child 6–23 months from Yaleko: *Until she abandons the breast of her own volition.*

Interviewer: *Even until 5 years of age, as she wishes?*

Mother: *Mmh!*

Cessation of Breastfeeding

Breastfeeding may end earlier (before the child reaches age 2) if the mother gets pregnant again. Other reasons for stopping breastfeeding prior to age 2 include:

- The mother needs to go work in the fields
- The mother is tired of breastfeeding or hungry due to additional energy expended by breastfeeding (both of these are linked to perceptions of the quantity and quality of breastmilk, as mothers are not able to make up the deficit in calories with enough food)

In general, women tended to return to the fields when their children were first introduced other foods, aside from breastmilk, so that they could go longer between breastfeeding sessions. This occurred at different times—whether at 6 months postpartum or as early as 3 months, as discussed earlier—which depended mainly on the family’s economic situation. Mothers and community members said breastfeeding continued and it ceased when an older child showed indications of no longer being satiated or refused the breast:

“[Children between 1 and 2 years old] are of the age to be weaned. Soon they’ll refuse to nurse.”

– Traditional healer, Bengamisa

Aside from when deciding to cease breastfeeding early because the mother needs to work in the field, complementary feeding often commences when mothers and families observe the child for indications that s/he no longer seems satisfied with breastmilk or seems to want to eat, which may include crying, starting to sit up, reaching toward plates of food, and refusing to breastfeed:

“We think that when the child starts to cry, to put out his hand, we say it’s time to let him eat.”
– Grandmother, Bengamisa

Families begin to introduce food bit by bit, as described above, usually bouillie followed after 6 months by “soft” foods, and then “hard” foods at 7–10 months. Softer foods include beans, fish, fufu, and somb . Harder foods, such as meat, were thought to not be appropriate for younger children because they lack teeth or a strong enough stomach to digest meat. Meat in particular was not often given to young children:

“Meat is too hard for him. They dry meat too much around here. Chewing this meat is really very difficult.”
– Father, Yaleko

“If a child is too young, custom states you don’t give him meat.” – Mother, Bengamisa

Other hard foods mentioned to be inappropriate for children included cassava, plantain (in lituma form), kwanga, and rice, as it was believed that children’s teeth were not developed enough to consume these foods.

Daily Food Frequency

Daily food frequency in children 6–59 months old, as shown in Figure 4, indicated children’s diets in Tshopo Province were predominately made up of fruits and vegetables, which comprise 34% of foods consumed on a daily basis (inclusive of fruits and vegetables rich in vitamin A). Carbohydrates, such as tubers (e.g., cassava, potatoes), and thin, watery porridge, and watery soups with small bits of meat are main features of the Congolese diet of young children. Daily intake of red meat was 8% of all daily foods. River fish was rarely eaten on a daily basis.

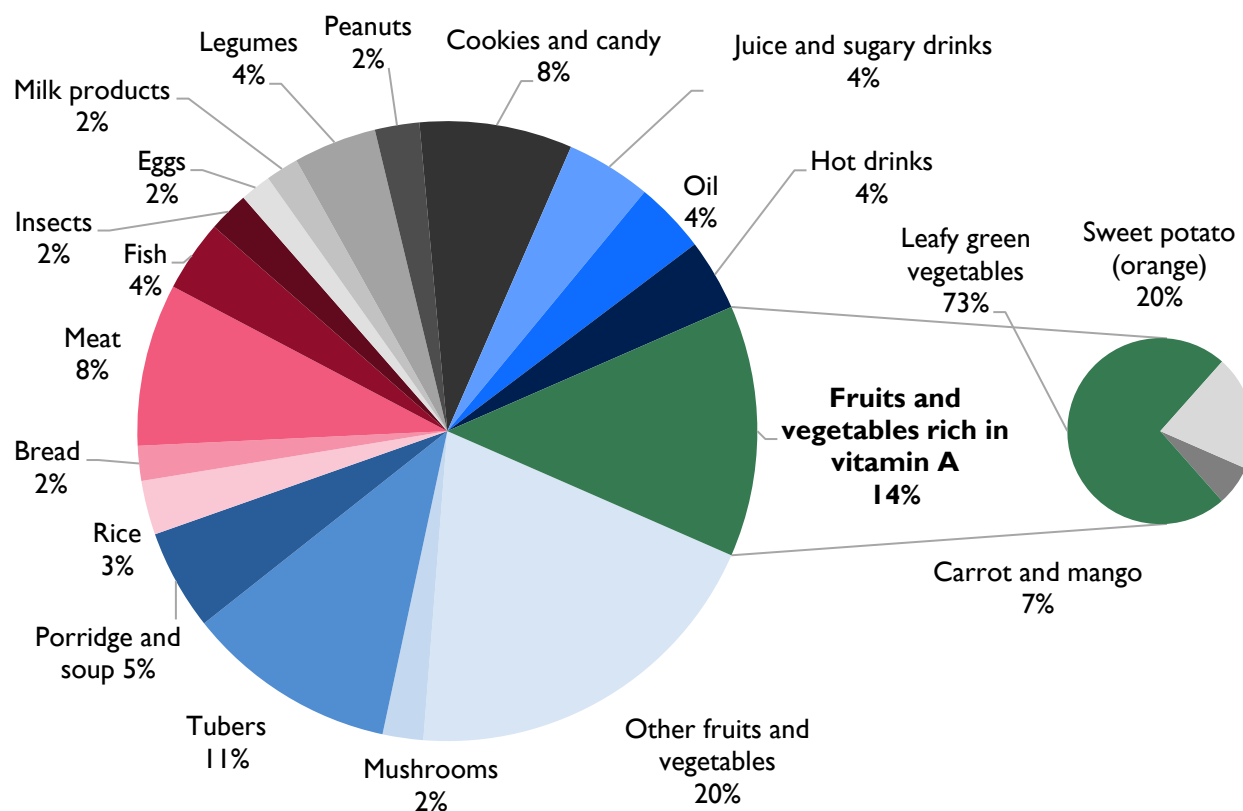
Interviewer: *Why isn’t [the mother] breastfeeding for the moment?*

Father, Bengamisa: *We forbid the breast for now, due to the age of the child—he’s 2 years old—so he can stop nursing because he’s starting to bite his mother’s breast. And also because of hunger—since we don’t eat well, he bothers his mother—so we decided to stop with the breast.*

Foods are often prepared in larger quantities for families in large pots and pans, though amounts of foods, consumed on a daily basis, were small (e.g., bits of meat in watery soup). At times, the amount of food consumed by children was difficult to quantify, given that a small amount of food may be set aside for the child to eat throughout the day:

“Children are like animals—if they see [food] pass them by, they will ask for it, and we’ll bring it to them.”
– Mother, Yakusu

Figure 4. Daily food frequency for 36 children, 6–59 months old



When children signal their hunger by crying or saying they are hungry (depending on age), they are often fed from a plate specifically prepared for them. While the child's mother is away in the fields, s/he feeds by his/herself or with the help of other relatives or older children in the household. However, the child's older siblings (or cousins or other children living in the household) may eat from this plate as well, as it is often their job to feed/care for younger children. Because mothers are not always the caretakers for young children, it was also difficult to estimate the number of meals children are given each day.

Weekly Food Frequency

Food frequency data indicate that of all foods eaten two to three times per week, animal sources are consumed with varying frequency on a weekly basis, though in small quantities (Figure 5). Sugary biscuits, sweets/candies, and sweetened and caffeinated beverages are a notable part of young children's diets (with consumption of 12–36 g, equivalent to up to 1/4 cup) (Figure 6). Biscuits may sometimes be added to porridge or tea and can be eaten at mealtimes, rather than just as a snack. Further, it was noted that as a child gets older, greater quantities of foods are fed to the child (closer to the upper range), yet these amounts are likely to not be sufficient for those children under 5 (Table 8). Breastfed children by 12 months old require about 1 cup of food (150 g) per meal (with three recommended meals per day), according to global guidance [19].

Figure 5. Children's consumption of animal source foods, at least two to three times per week (ages 6–59 months)

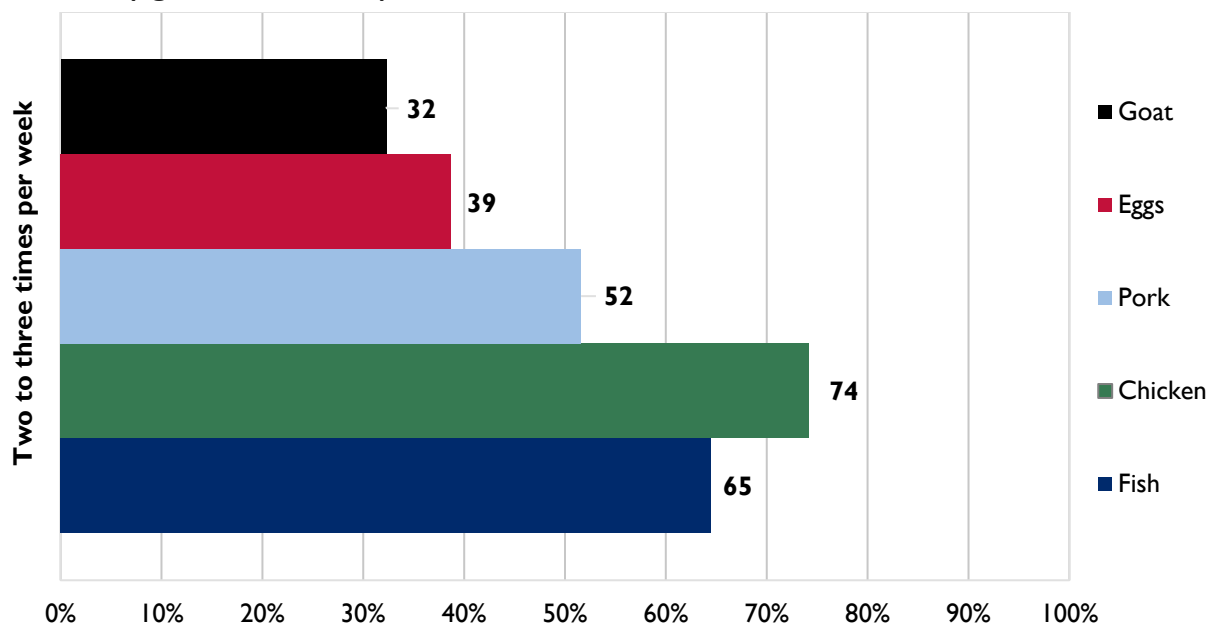


Figure 6. Children's consumption of processed foods and hot/sweet beverages at least two to three times per week (ages 6–59 months)

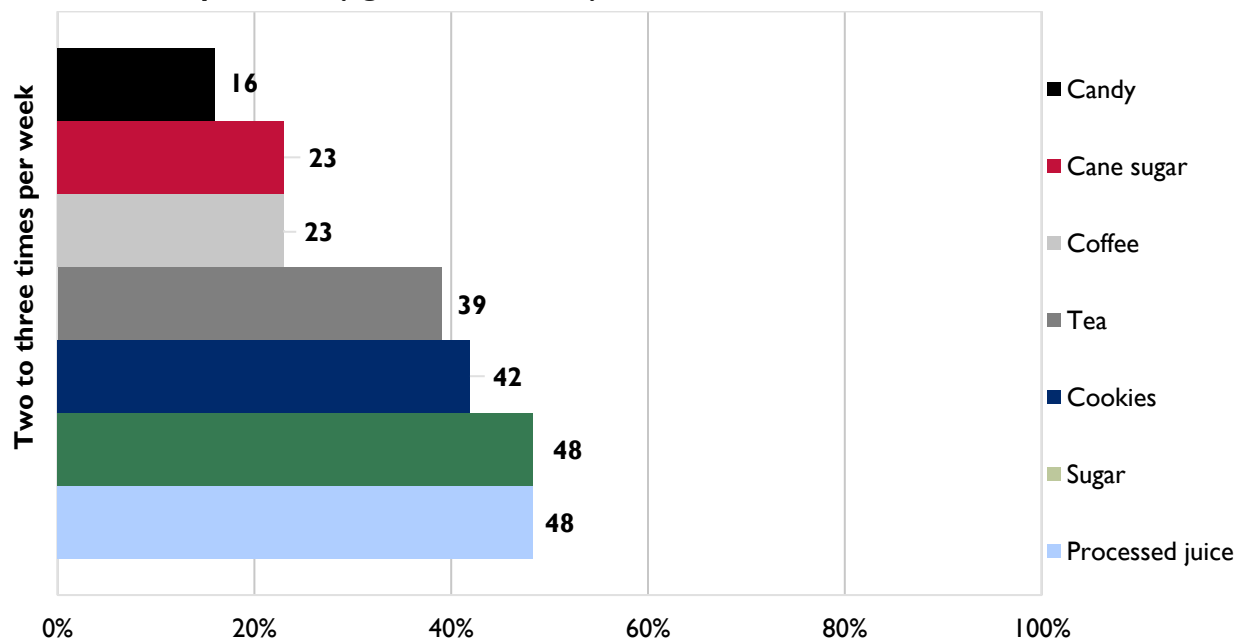


Table 8. Estimated quantity of food consumed by food item (range in grams), children ages 6–59 months, according to 24-hour recall, Tshopo Province

List of Foods, Tshopo Province	Typical Quantities Of Food Consumed, Children Ages 6–59 Months
Papaya	45–270 g
Amaranth	20–250 g
Spinach	100–200 g
Cassava leaf	20–200 g
Banana	25–500 g
Eggplant	10–20 g
Soup (with small pieces of meat)	8–70 mL
Chicken/beef/fish	20 g
Eggs	25–50 g (0.5–1 egg)
Beans	20–80 g
Cassava	75–250 g
Sugary biscuits	12–36 g

1/4 cup = 37.5 grams

1/3 cup = 50 grams

1/2 cup = 75 grams

1 cup = 150 grams

Some community members mentioned taboo foods for children, including game meat (also sometimes taboo for breastfeeding mothers), serpent, and other wild animals (ngonda), which were said to cause diarrhea. There were also taboos by sex—females of any age were not supposed to eat wild animals (crocodile, snake, jackal). However, a larger number of respondents said no foods were taboo or forbidden for children, who ate whatever was “available.” As one mother from Yakusu put it, “Here, no food is forbidden. You just give [the child] food and he eats it.” Cost and availability seemed to be the most important factors in deciding what to feed the child.

In terms of responsive feeding, most families said they watched and encouraged the child to eat and that few children were left alone to eat. Many families said they took pleasure in seeing their child eat well. However, data collectors said many respondents were surprised by questions about responsive feeding (encouraging the child, trying out different foods, encouraging the child to play with the food), suggesting that these behaviors are unusual in this context. Some mothers, fathers, and grandmothers said that when the child plays with and throws food, this indicated that s/he was sated, so rather than let him/her destroy the food, they took it away until later in the day when the child signaled hunger again. For some families, this process of learning to eat was considered normal, and they let the child play with the food for a little while, whereas for others, this was considered bad behavior. Thus, some families did not mind when children played with their food, but others became angry at the waste of food. In some instances, families mentioned a lack of patience, including “forcing” the child to eat. However, because caregivers other than the mother were often providing care/feeding the child, information on how these caregivers interacted with children is lacking.

Interviewer: How do you feel when you give the child food and instead of eating it, he plays with it?

Grandmother, Bengamisa: I’m very angry.

Interviewer: What do you do?

Grandmother: I hit him – he’s spoiling my food.

Fathers had perhaps less patience when children played with their food, but they fed them less often than mothers or grandmothers. Fathers' role in feeding was sometimes limited to giving advice rather than feeding the child, and some fathers said it was not their job to feed the child at all. However, many other fathers enjoyed mealtime with their children and engaged in feeding their child.

"I [carry the child], or I take a piece of food and bring it to his mouth ... Both of you are happy. You try to make him laugh."
– Father, Ubundu

The role of grandmothers was to give advice, often based on their own experience. While data collectors sometimes had difficulty having grandmothers describe the exact advice they gave to daughters (and daughters-in-law), they did mention providing counsel on:

- How to care for infants and children generally: Wash children and braid their hair, wash their clothes, do not hit them, and put them in school.
- How to breastfeed: Give the breast often, the mother should eat enough food herself and/or take traditional drugs so as to have plenty of breastmilk, and wash breasts with soap and water after returning from the field and before breastfeeding.
- When to start feeding infants: Start to feed the child food/liquids once s/he can sit up, around 4 to 6 months.
- How to feed infants and children: Feed the child enough (i.e., by setting aside food in the evening so the child has something to eat in the morning or, less commonly, do not give children too much food because they will cry when there is not enough), feed the child until s/he is sated, and give food containing vitamins.
- Food hygiene: Wash your hands before preparing and serving food, and do not feed children food that has been left uncovered.
- How to feed and care for sick children: Continue feeding; occasionally, force the child to eat a bit; give enemas to restore appetite; give *bakeke* tea with bread or biscuits, rice with *mboka* and/or *sombé*, fresh fish, crushed peanuts, eggs, fufu, and tomatoes

Occasionally, grandmothers' advice on feeding children (e.g., to give them enough food) seemed to stem from the desire to avoid shame and from an interest in the child's well-being:

"My children, when I left to work in the field, I would leave them food and they'd eat until they were sated. I didn't want them to [seek out food] in other people's houses." – Grandmother, Ubundu

Grandmothers also often fed children when the mother was away in the fields. In polygamous families, co-wives sometimes fed children as well. Perhaps most often, older siblings (brothers, sisters, cousins, and other children in the household) fed children when the mother was away. According to some community members, these siblings did not always take seriously the responsibility of acting as caretakers:

"You can say to the mother: 'Are you going to the forest? You'll leave the children with whom?' 'Oh, his older brothers, his older sisters.' Can these children take care of these other children? Well, often they say they do a good job taking care of the children, but it doesn't always go so well ... These [older] children, either they play or do something else, some go to school, and sometimes they forget too." – Nurse, Bengamisa

As alluded to above, mothers were often criticized for leaving their children to others to care for and feed, even if they seemingly had no choice:

“I second what my brother said over there with respect to work: some [women] neglect their children ... You’re going to leave the child from morning till night without breastfeeding so you can concentrate on your work?” – RECO, Yaleko

Care Seeking for Childhood Illness

Families start by recognizing signs or symptoms of illness in children (fever, cough, loss of appetite, pallor, etc.), without necessarily distinguishing the cause. Mothers, fathers, and grandmothers were attuned to symptoms of ill health and said they noticed “only that the child is ill—we don’t know the difference between malaria and fever” (Father, Bengamisa). In addition to these, key symptoms of illness—including malnutrition as a symptom that a child is “unwell”—are noted by study participants in the child’s appearance (hair and skin color changes, small size, swollen limbs, thinness), as well as lack of appetite and/or desire to eat:

“If the child suffers from malnutrition, you’ll recognize it directly in his way of waking up and going to sleep and how he plays.”
– Traditional healer, Ubundu

Families distinguish among different categories of diseases, including those with natural and spiritual causes, and those that must be treated by “modern” or traditional medicine. These overlapping distinctions determine how care is sought:

“[Fota itoko] is treated traditionally because it’s with traditional medicines that children recover quickly ... When the child was ill, we took him to the hospital, you see your child getting diarrhea, when you look at the child’s bottom ... you see a large sore That’s how we knew that an illness like this—people who know traditional medicine started to say, ‘Use medicines like this.’” – Father, Bengamisa

“If it’s a disease that has to do with traditional medicine, I go to the healer. If it’s a modern disease, I go to the closest medical facility ... I know [which type of disease it is] by looking at the child.” – Mother of child 0–5 months, Yaleko

All or nearly all respondents agree that *kunde* and *Fota itoko*, for example, were cases for traditional healers, whereas malaria and pneumonia were cases for the health center.

In the case of *Fota itoko* or other “traditional” diseases, families will usually go straight to the traditional healer, who prescribes herbal remedies or often purges, in which leaves are mixed together and boiled, then introduced (once cooled) as an enema. Indeed, enemas were common treatments for all kinds of illness but were prepared and administered differently depending on the illness (e.g., for *Fota itoko*, a lemon juice enema was often recommended). Other plant-based treatments mentioned by families or traditional healers included introducing medicine by “tattoos,” more likely a form of scarification, via the eyes, in the child’s bath, or as a pomade on his chest. Several traditional healers also said they provided modern drugs from the pharmacies to sick children and then often referred families to further medical treatment if they recognized they were not equipped to treat the illness or if it persisted. In addition to these pharmacological treatments, children may also be prayed over in ceremonies to “chase the demons,” whether by traditional healers or at the church.

If it is a “white man’s” disease, families often start by purchasing drugs for children without seeing a medical professional in a health care facility or by seeking traditional care for the symptoms. Families often spoke of going to the “pharmacy” (most likely an unlicensed local drug vendor) to procure drugs in the early stages of a child’s disease. Some also used traditional home remedies:

“I take care of him myself if I can’t bring him to the hospital, where the doctor is.” – Father, Ubundu

“[I care for the child by] washing him, washing his clothes. If he gets sick, I give him medicine, I make sure he’s protected ... [When he didn’t get better], I bought medicine at the pharmacy and gave it to him right here, at home.”
– Mother of child 0–5 months, Ubundu

Symptoms of illnesses covered by iCCM can be interpreted by families as having traditional or modern causes (Table 9). For example, cough can be a symptom of traditional illnesses, such as Fota itoko and kafeke, or of Western illnesses, like pneumonia. Care-seeking behaviors thus depends first on recognition of the disease, then on availability of care and other barriers, as well as perceived severity. Regardless of the diagnosis, families tend to first try home care, then proceed to other options if the child does not improve or the illness is perceived to become more severe:

“Some [treatments] are traditional and other are modern. If it doesn’t work within 2 days, then I take him to the hospital.”
– Father, Ubundu

Families sometimes assimilated local illnesses to other Western diseases, saying the same illness also had a Western name.

“Here, we say lunyama, but at the hospital, they say malaria.” – Grandmother, Bengamisa

Some respondents said Fota itoko was their name for measles or malaria, but more often, they were understood to be separate diseases. However, the signs and symptoms of Western and traditional illnesses can overlap:

“In this case, [when the child has a cough and fast breathing], we recognize that the hospital isn’t competent to treat this kind of problem, so we turn directly to traditional medicine.” – Father, Yaleko

This assimilation of modern and traditional diseases can have implications on the recognition of danger signs, such as fast breathing or convulsions. One episode recounted by a data collector went as follows: A mother arrived at health center to seek treatment for her sick child. When the child started convulsing, instead of petitioning a nurse or doctor, she raced to the center’s latrines to put the child’s head above the dirty water, whose smell was supposed to revive him. This practice was also described in one of the interviews:

“For lunyama ... that is, severe malarial convulsions ... when it takes a child in the community, you take leaves to make a liquid, then put drops in the child’s eyes ... Then you take him to the toilet and put his face in the hole. When he breathes the toilet air, he revives, then after that, they bring the child to the hospital.” – RECO, Yakusu

Similarly, difficulty breathing can be interpreted not as a danger sign of pneumonia but rather a symptom of the traditional illness kafeke:

Interviewer: *If the child has difficulty breathing ...*

Father, Bengamisa: *In that case, you give him traditional medicines ... We call this illness kafeke. It’s the name of a fish that breathes the same way.*

Interviewer: *So what do you do then?*

Father: *You must find the head of the kafeke [fish], burn it, then take the traditional salt and mix with the powder from the burned fish. You tattoo [scarify] the chest and apply this medicine. If it's really this disease, after a few minutes, the child will start to breathe well again.*

For malaria, some said to go straight to the hospital to do the “test,” though others said it could be treated traditionally:

“If we think it's malaria, we use the leaves that treat malaria. If that doesn't work, you have to go to the hospital.”
– Grandmother, Bengamisa

For diarrhea, families generally started with home care, then proceeded to traditional or biomedical care. There was little mention of using ORS except by health center personnel, though sometimes mothers said they obtained a powder from health providers to be mixed with boiled water. As for pneumonia, families tended not to use this word at all. Indeed, it was not spontaneously mentioned by any fathers or grandmothers and by only one mother:

Interviewer: *He was having trouble breathing?*

Mother of child 6–23 months, Ubundu: *Yes, he was having trouble breathing, but not like with pneumonia; he didn't have a strong cough and mucus obstructing the nose.*

In terms of malnutrition, families may be more likely to seek care based on distinct reasons rather than severity. As discussed, families may not recognize stunting, as they tend to measure their children's growth by comparing their size to other children—over one-third of whom are likely to be stunted in the study communities. On the other hand, while families recognize signs of acute malnutrition (e.g., SAM), such as changes in hair and skin color, kwashiorkor, etc., families may not seek care due to the shameful nature of the illness, as discussed above in the discussion on *Community Perceptions of Child Health, Growth, and Well-Nourishment*. Still, despite this stigma, some families still do seek care. While some said kwashiorkor was a case for Western medicine, others said it could only be treated by traditional healers. Traditional healers themselves disagreed on how SAM should be treated:

“If it's kwashiorkor, I say go to the medical center because this disease goes beyond my abilities ... Kwashiorkor is reserved for modern medicine.” – Traditional healer, Yaleko

“Modern medicine can't treat malnutrition. Only I can treat malnutrition.” – Traditional healer, Bengamisa

When families recognize signs of “poor growth,” such as listlessness or lack of appetite, or clinical signs of acute malnutrition, they tend to provide improved nutrition (more food and/or more nutritious/appetizing food), take special care with hygiene, and give enemas⁶ and plants to stimulate the appetite. Families said severe cases required medical care but were sometimes limited in their means to go to the health center, as discussed below. However, they were also incentivized to seek care at health centers because diagnosed malnutrition cases were provided with free supplies of supplementary foods (e.g., Plumpy'Nut) to take home and follow-up care. It is also possible that families sought care for acute malnutrition after interpreting malnutrition as a symptom of another illness:

“At the hospital, they'll examine him to see why he's not eating.” – Grandmother, Yakusu

Community members and traditional healers often had differing opinions about which diseases should be treated by traditional healers and which should be treated by biomedicine. Thus, a pronounced medical “syncretism”⁷ characterizes treatment of all illnesses. Families seek care from traditional and biomedical sources at the same time

⁶ Liquid (i.e., plant solutions) introduced via the anus.

⁷ Syncretism usually refers to “the attempted reconciliation or union of different or opposing principles, practices, or parties, as in philosophy or religion;” it used here by analogy (source: Random House Dictionary, 2018).

or one after the other in case of treatment failure, sometimes starting with modern medicine, and sometimes with traditional. This appears to be true for malaria, diarrhea, and pneumonia, and the identification of acute malnutrition covered in iCCM, though to somewhat varying degrees:

“If the child is sick, prepare him so that we can go directly to the hospital, do the traditional treatment, and then we’ll take him to the church.”

– Grandmother, Yakusu

When it is unclear what is causing the illness, traditional healers can also be consulted as diagnosticians who can identify whether possession by spirits or some “natural” cause is at fault:

“If it’s a disease caused by bad spirits, then those will come out [with my treatment]. If it’s not a traditional disease, we’ll go to the hospital because that’s where [the child] will get better.”

– Traditional healer, Bengamisa

Interviewer: When the child had a fever, did you take him to the hospital? You or his parents.

Grandmother, Ubundu: No, they bought pills only. When he gets better, you leave it alone.

Interviewer: Why didn’t you take him to the hospital?

Grandmother: Because of money.

In many cases, parents are advised to pursue traditional and modern medicine at the same time:

“If I see a malnourished [child], I tell [families] to follow all paths—the path of the hospital and the traditional one.”

– Traditional healer, Yaleko

“When you mix [traditional treatment] with modern, the child will get well.” – Traditional healer, Yaleko

One nurse gave a concise summary of the patterns observed in the data with respect to the different choices of care seeking for child illness.

“Sometimes parents go straight to the health center, and sometimes they keep their children at home—those who don’t have the financial means. And sometimes some parents take their children to traditional healers [charlatans] and also do self-medication too.” – Nurse, Yakusu

According to families, the primary reason for not at first seeking modern health care is the cost of treatment. While national policy supposedly provides free care for children under 5, this is clearly not in effect in all areas. As one health provider said, “Here, we almost have free care.” Another said medical care “appears to be free but isn’t as free as indigenous products (plant-based treatments, spiritual cures such as scarification, enemas, etc.).” Thus, financial barriers often made it difficult or impossible for families to seek care at health centers, even when they would have wished it:

“They ask for a lot of money at the hospital.” – Mother of child 24–59 months, Yaleko

“The child didn’t go to the hospital ... for lack of money. Life is difficult.” – Grandmother, Bengamisa

“The past month, we didn’t have enough money in hand to go to the hospital. Since the money wasn’t there yet, we said first we’ll buy traditional medicines.” – Father, Bengamisa

“They [villagers] all chip in to [pay for care]. Even if they don’t have money, they can sell their livestock or chickens so as to send their child to the hospital.” – Traditional healer, Bengamisa

“A child who could be cured dies for lack of means.” – Traditional healer, Yaleko

Table 9. Symptoms and care options for childhood illnesses

Symptom	Diseases Associated With	Home Treatment (Traditional/Modern)	Treatment from Traditional Healer	When/Why to Go to the Health Center/RECO
Fever (“hot body”)	<ul style="list-style-type: none"> • Malaria • General sign of illness 	<ul style="list-style-type: none"> • Cold bath • Enema with leaves (sometimes also applied to body) or with lemon • Paracetamol 	<ul style="list-style-type: none"> • Enemas, herbal treatments (if <i>Fota itoko</i>) • Prayer to deliver child from spirits 	<ul style="list-style-type: none"> • To do the “test” (rapid diagnostic test), many say “only the hospital can treat malaria” • After 2–3 days with no improvement
Cough (usually with fever)	<ul style="list-style-type: none"> • Pneumonia • <i>Fota itoko</i> (especially without fever, with anal sores) • <i>Kafeke</i> (with fast breathing) 	<ul style="list-style-type: none"> • Herbal treatment made from reeds (<i>roseau</i>), wild onion, and mango tree leaves (for cough without fever) • Bactrim (antibiotic) and chloramphenicol (for cough with fever) 	<ul style="list-style-type: none"> • Scarification with powder from <i>kobukobu</i> plant and fish head (for pneumonia/<i>kafeke</i>) • Prayer to deliver child from spirits 	<ul style="list-style-type: none"> • After 2–3 days with no improvement • If the cause is modern, not spiritual • With fast breathing (sometimes) • With difficulty breathing
Diarrhea	<ul style="list-style-type: none"> • Infectious causes • <i>Fota itoko</i> (with sores on anus) • Malaria • Malnutrition 	<ul style="list-style-type: none"> • Papaya or <i>kamba</i> leaves, tree bark, other plant-based treatments • Enemas (e.g., for worms) or with lemon for <i>Fota itoko</i> • Medicines from pharmacy (levamisole, chloramphenicol) 	<ul style="list-style-type: none"> • Further plant-based treatments (oral or administered by enema) • Scarification around the navel (if <i>Fota itoko</i>) 	<ul style="list-style-type: none"> • For severe cases • After 2–3 days with no improvement • To get “serum” (oral rehydration salts)
Convulsions	<i>Lonyama</i>	<ul style="list-style-type: none"> • Placing the head of the child above the latrine to revive him 	<ul style="list-style-type: none"> • Liquid from leaves is placed in child’s eyes so “gaze returns to normal” 	<ul style="list-style-type: none"> • Modern treatment may be sought after traditional treatment, but this is generally seen as an illness with spiritual causes
Lack of appetite	<ul style="list-style-type: none"> • Associated with any other illness • Intestinal worms 	<ul style="list-style-type: none"> • Enemas • Drugs from the pharmacy (Super Apeti tablets, or cyproheptadine) • Prayer 	<ul style="list-style-type: none"> • Traditional drugs or examination to determine cause 	<ul style="list-style-type: none"> • If the enema does not work • With other symptoms • If there’s <i>kwashiorkor</i>
“Lack of blood”	<ul style="list-style-type: none"> • Anemia • Poor growth 	<ul style="list-style-type: none"> • Improved nutrition: <i>sombé</i>; fish; mixture of eggs, tomato and sodas (i.e. soft drinks) • Plant-based medicine made from <i>Kopele</i> bark (resembles blood) • Burnt sugar mixed with water 	<ul style="list-style-type: none"> • Traditional plant-based medicines • Prayer 	<ul style="list-style-type: none"> • To do exams to understand the cause • If traditional treatments fail • To get an injection

Families often mentioned trying home or traditional treatments first and waiting to see if the child got better to avoid spending money at the hospital unless it was absolutely necessary.

“I start with traditional medicine if I don’t possess any money. If God helps, all the better. If it gets bad, I go get modern treatment at the hospital.” – Father, Ubundu

“The mother hurries to the traditional healer because she won’t be asked to give much money.” – RECO, Yaleko

Families also actively sought to raise money for the treatment, either by earning it (e.g., by producing palm nut oil, as one grandmother described) or by borrowing it from friends and relatives.

In contrast, traditional healers were often much more flexible about payment. Families are usually not required to pay the traditional healer upfront, or can sometimes pay in kind, meaning they can be sure of obtaining treatment even if they lack cash:

“Yes, the [hospital worker] says, ‘If I get no money, then I’m staying home.’ But maybe I only have my one bird—maybe it’s a chicken or a duck—so I leave with that, and I beg my brother to treat the child ... and he says, ‘Since I’m not getting anything, I’m staying at home.’ That’s how the sickness gets to weaken the child and it can die.”
– Traditional healer, Ubundu

Other barriers mentioned by families to seeking care in medical facilities included lack of time (due to the necessity of working in the fields), distance to medical facilities, and the lack of drugs in facilities once they arrived. Notably, health centers are often opening during the hours people work in the field, whereas traditional healers can offer hours that are more flexible.

When it comes to feeding the sick child, as mentioned above, loss of appetite or refusal to eat is often seen as the first symptom of illness in a child. As a general rule, parents say they still try to get their child to eat while they are sick. In poorer households, this means children still eat food from the family’s communal plate during mealtimes. In better-off households, families may prepare special foods for children, including fresh fish, Cowbell milk, and/or bouillie made from corn (or occasionally cassava). Foods are not withheld from children when they are sick. Breastfeeding continues unless the disease is due to infected or lesser-quality breastmilk (due to too-infrequent breastfeeding sessions, the mother’s consumption of contaminated food or water, or another cause). In the case of kunde, the mother can simply breastfeed the child from the other (uninfected) breast. Healers also share the information that it is important to keep feeding the child:

“We tell mothers to continue to breastfeed because if the child stops nursing, it’s death.” – RECO, Yakusu

The foods given to sick children seemed in all respects quite similar to those given to healthy children—that is, whatever is “available” or might particularly please the sick child. The same food taboos for children (game meat, etc.) are also sometimes observed. Again, economic factors may be the most pressing:

“The foods that one can’t give to a sick child—here in our community, it’s money that defines that.” – Father, Bengamisa

One exception is that in the case of diarrhea, parents and caregivers might abstain from giving children *sombé* or other leafy foods or vegetables that could upset their stomach.

Roles in Child Illness

Caregivers have different roles in caring for sick children, beginning with treatment in the home provided by family members. As described above, families (especially mothers and grandmothers) provide basic care for sick children, including washing and feeding them, and giving enemas, plant-based treatments, and drugs from pharmacies (likely unlicensed providers).

Fathers gave advice about how to prevent disease (keep children clean, and dress and feed them well). Once the child was sick, they also advised on how to feed them. Fathers also went to the pharmacy to purchase drugs for sick children. Perhaps most important, fathers were often responsible for deciding what kind of treatment would be sought (traditional or modern):

“When the child was sick, I said to my wife that the health of our child isn’t good, and we need to bring him to the hospital for modern medical care because traditional treatment has failed.” – Father, Bengamisa

Grandmothers also gave advice on preventing diseases (e.g., handwashing) between modern and traditional medicine (i.e., traditional or modern, in some cases), recommending consumption of herbs to treat insufficient milk, and feeding the sick child (e.g., feeding biscuits with tea when sick) (see Table 10). Some elder relatives were also said to help with financing care for sick children.

Different types of health providers perform different roles in caring for sick children, including traditional healers, different types of RECOs, nurses, and doctors. Beginning with those who are closest to the community, traditional healers are often the first health providers who are consulted when a child falls ill and fails to improve with home treatment. Traditional healers receive sick children, make or confirm the diagnosis, and determine whether they are competent to treat it. If they are competent, they provide treatment. Otherwise, they refer children to a health center. All traditional healers spoke of the different types of medicine, and many deferred to modern medical treatment and referred children to a health center when they were unable to treat them themselves:

“The child who has malaria—I try to heal him, and if that doesn’t work, I say, ‘No, you need to go to the hospital so he can take the test.’” – Traditional healer, Yakusu

“If it’s a disease that can be treated traditionally, I take care of it. If it’s modern, I say, ‘It’s not for me; it’s for modern medicine.’” – Traditional healer, Yaleko

“Especially malaria and diarrhea, and those that are missing water or blood in their bodies—we send [those cases] to the hospital.” – Traditional healer, Yakusu

Table 10. Roles of fathers and grandmothers in prevention and care seeking for child illness

Fathers	Grandmothers
<ul style="list-style-type: none"> • Give advice about how to prevent illness in children (keep children clean, do not go too long between breastfeeding sessions). • Help diagnose the child’s illness (including distinguishing between Western diseases and local illnesses). • Recommend treatment for illness (usually to try traditional treatment first, then modern medicine if the child does not improve). • Give the child a good diet (give the child enough food, give food with vitamins). • Seek out medicines at the pharmacy. • Pay for treatment and care. 	<ul style="list-style-type: none"> • Give advice on preventing disease (e.g., wash hands before preparing food, make sure the child eats enough). • Give advice on caring for and feeding the sick child (continue breastfeeding, give the child an enema to stimulate appetite, give the child <i>bakeke</i> tea and biscuits). • Advise mothers on breastfeeding (give the breast often, continue feeding sick children, eat enough food and/or take herbs to have sufficient quantity of breastmilk). • Sometimes help finance the care of sick children to take them to a health facility.

Occasionally, traditional healers said they were trained in both traditional and modern care:

“They come because first of all, I’m a nurse. I give modern medical care. I’ve been trained in modern medicine. I didn’t finish my degree—I can’t know everything, given my limited studies. But they come for me to treat them. I work as a pharmacist for the moment. I have a letter of authorization to sell medicines.” – Traditional healer, Bengamisa

As discussed above, however, there is significant variability among traditional healers with respect to their understanding of their competencies. In the study’s sample of traditional healers, each of the diseases included under iCCM (including malnutrition) was mentioned as either treatable or not treatable using traditional medicine.

Traditional healers sometimes did—and sometimes did not—recognize danger signs (e.g., fast breathing) as reasons children should go to the hospital. They sometimes interpreted danger signs as symptoms of traditional diseases (e.g., kafeke, named after a fish that appears to breathe quickly) that must therefore be treated traditionally. Yet at the same time, when asked directly about modern diseases, they often said “only the hospital” could help:

Interviewer: *What is your advice for families whose children have diarrhea?*

Traditional healer: Yakusu: *It’s just to go to the hospital.*

Interviewer: *For malaria?*

Traditional healer: *It’s simply to go to the hospital.*

Interviewer: *For pneumonia?*

Traditional healer: *Simply to go see the doctor at the hospital.*

The type of care provided by traditional healers also varied, ranging from plant-based treatments, purges, scarification, and prayers and spiritual treatments, to the dispensing of modern drugs available from the pharmacies. As one healer noted:

“It’s God who [decides], so before doing this work, one must ask Him.” – Traditional healer, Yaleko

In any case, it is clear traditional healers care for children and their families in ways that modern medicine does not or cannot—notably, by treating the spiritual aspects of disease, and providing flexibility in payment modalities (not requiring payment on delivery of services, allowing payment in kind, etc.) and location:

Interviewer: *[In case of cough], do you advise [the mother] to see traditional or modern treatment?*

Traditional healer, Ubundu: *You have the choice. Since we’re far from the hospital here, we [traditional healers] can help.*

With respect to nutrition, breastfeeding practices, and perceptions around transmission of certain illness through breastmilk, the traditional healer has the primary role of providing treatment of kunde. As mentioned above, kunde is a preoccupation of no small number of breastfeeding mothers:

“I treat kunde. I put monoka on [the child’s] fingernails and on her eyes. I also put it on the mother because the mother is the one who’s contaminated with this disease. Because when the child is suckling from her mother, that she becomes contaminated. The child isn’t born with kunde. She gets it from her mother.” – Traditional healer, Yaleko

Traditional healers also occasionally provide advice on appropriate foods for breastfeeding mothers to eat, as well as for young children (e.g., avoidance of taboo foods and/or consumption of bakeke tea or mbochi leaves to stimulate breastmilk production).

There is a certification process for traditional healers, but it is seen as onerous and inviting official scrutiny and financial outlays. As one healer said:

“We’re afraid of the agents of the state ... I don’t have any state documents ... They make us pay. Right now, I’m afraid of you [the interviewer] because you arrived today [to question me].”

– Traditional healer, Yaleko

For this reason, most traditional healers interviewed here seemed to prefer to avoid the process or were unaware of it.

Interviewer: *If the child has diarrhea, what do you do?*

RECO #1: *We do the traditional treatment. We mix salt and sugar in water. One spoonful of sugar and one of salt.*

Interviewer: *The same quantity?*

RECO #2: *Yes.*

As nearby representatives of modern medicine, RECOs are often consulted next or at the same as traditional healers. Two types of RECOs are available to provide counseling and care. RECO sites, based at sites in villages, receive formal training to diagnose and treat basic childhood illnesses like those included under iCCM. Relais promotionnels are meant to visit villagers’ homes to provide advice on feeding and caring for young children, and recognize danger signs. They are also trained to conduct health-related communication activities and mobilization in their communities.

Problematically, the gap between the services that RECOs are supposed to provide (and many said they did provide) and those reported by community members was significant. For example, in FGDs, RECOs provided details about which days they did home visits (e.g., on Saturdays and Sundays, when mothers were not off in the fields, or early on Monday mornings), yet few mothers, fathers, or grandmothers said they had received a visit from a RECO recently. The only home visits reported were for vaccines (often for polio), with few or any visits to provide general nutrition counseling.

In practice, it seems that many RECOs are not provided with drugs or the required supplies:

“We don’t have medicines. We only advise them to go to the hospital.” – RECO, Yaleko

Other RECOs seemed to be supplied with drugs like paracetamol, sulfamethoxazole/trimethoprim (an antibiotic), and antimalarials, which they dispensed from community care sites. ORS were mentioned less often. RECOs did not seem to be supplied with rapid diagnostic tests (RDTs) at the community level, even though they were meant to under national iCCM policy. RDTs seemed to be used only at health centers, not in community case sites, but because the questionnaire did not specifically ask about RDTs, it is difficult to state this with absolute certainty. As a result, RECOs would either refer suspected malaria cases to health centers for the test or treat them at the community care site without being certain of the diagnosis. Given the limitations of RECOs in terms of training and supplies, referral to the health center appeared to be a major component of their activity. They would also refer sick children to traditional healers, although this appeared much less common.

The advice RECOs provided to families regarding child health, illness, and nutrition was to prevent disease via vaccination, use of bed nets, handwashing, etc.; provide children with a healthy, balanced, and hygienically prepared diet; and perhaps, above all, bring sick children to the health center. A typical statement by a RECO on the topic of prevention looked like:

“If a child suffers from malnutrition ... it can be due not only to hunger, but to germs. So you advise the parent to protect the child from germs by washing his/her hands before eating. And the child shouldn’t sleep in a bad place so as to protect from germs that could hurt his/her health.” – RECO, Yaleko

In general, the nutrition advice provided to mothers and families as discussed by RECOs was general information on feeding practices, without specific advice tailored to context or families' suboptimal IYCF practices, needs, or challenges. Whether during home visits or at the health center, RECOs said they advised mothers and families to:

- Breastfeed exclusively for the first 6 months of life.
- Practice good hygiene (wash hands, wash breasts before breastfeeding).
- Give children foods that are appropriate for their age (i.e., soft foods first, harder foods later).
- Go to the health center in case of difficulties with breastfeeding.
- Eat enough food/eat a balanced diet to be able to breastfeed well.

RECOs discussed the importance of breastfeeding, yet they sometimes shared the concern, echoed by mothers themselves, regarding insufficient breastmilk:

"We say this: From 0 to 6 months, the child must be exclusively breastfed with mother's milk. The mother mustn't lack milk in her breasts, and the child must breastfeed on demand because mother's milk contains the nutrients that God prepared for the child during this period." – RECO, Ubundu

However, these counseling activities do not appear to have actually been reaching families, and little is known about the content/quality of actual counseling, whether in their homes (given the lack of evidence of home visits) or through other SBCC activities.

Occasionally, RECOs acknowledged the usefulness, or at least the practical necessity of traditional medicine, but usually they were less sanguine about its benefits:

"Sometimes if you're lucky, traditional medicine will bring the solution."
– RECO, Yaleko

"We tell them to go to the health center. We don't accord much consideration to traditional medicine." – RECO, Bengamisa

Some community members expressed similar skepticism about traditional medicine:

"So I know the child will grow up well, you have to ... bring him to the hospital if he's sick. Me, I don't go to quacks."
– Father, Yaleko

However, overall the use of traditional medicine was widespread, if not universal.

Finally, health providers working in health centers play the expected roles of receiving sick and malnourished children, diagnosing their illness, and providing the appropriate treatment. The advice they most often give to families is to bring sick children directly to the health center and to prevent disease by practicing good hygiene (e.g., handwashing) and using insecticide-treated bed nets:

"You must bring [the child] to the hospital—never give him/her whatever medicine you find—but bring him to the hospital."
– Nurse, Ubundu

Interviewer: *The RECO, has s/he come here over the past month?*

Mother, Yakusu: *The people who give vaccinations? Yes, they came by.*

Interviewer: *What advice did they give you about the children's health?*

Mother: *They didn't give any advice. They just come to give the children the vaccine and then they leave.*

Very often, parents mentioned that their children received injections at the health center, sometimes to a surprising extent:

“The medicines they gave him, I don’t really know what they are. I just saw that they injected him with medicines, sometimes three to four injections per day.” – Mother of child 24–59 months, Ubundu

Similar to RECOs, health facility-based providers said they gave the following general nutrition advice:

- Give colostrum to the newborn.
- Breastfeed exclusively for the first 6 months.
- Continue breastfeeding when the child is sick.
- Mothers should eat well to have enough breastmilk.
- Introduce *bouillie* at 6 months.

This advice is delineated in IYCF counseling cards, but provider training was only rolled out in eight of the 23 health zones in Tshopo Province. Therefore, the actual advice received by families is not clear and was not largely discussed by family members or mothers, aside from giving colostrum to the newborn. Unlike with RECOs, mothers seemed to report receiving this advice and following it when it came from facility-based health providers:

“If you give birth in the village without going to the hospital to receive this education, you’ll start to give food to your child before it’s time.” – Mother of child 24–59 months, Yaleko

Nonetheless, the attitudes of facility-based health providers could be judgmental about families’ ability or desire to care for their children. The choice to not bring children directly to a health center was often criticized by health providers:

“Because here among the Congolese, we wait until the child suffers to be able to bring him to the hospital.” – Nurse, Ubundu

Health providers frequently used the word *négligence* (“neglect/carelessness”) to describe such behavior:

“With respect to the child, first you find that there’s a poor level of care. Beginning with parents, that is to say parents’ négligence as well as that of the entourage.” – Nurse, Yaleko

“The other thing is négligence. Some mothers come to receive advice on breastfeeding—they listen, but they don’t apply it.” – RECO, Yaleko

“If the child is ill, certain families négligent (neglect) to bring him to a health center because they don’t have the money. They have recourse to indigenous medicine, and they say, ‘I’ll do a purge first.’” – Nurse, Bengamisa

A text search of the prefix *négl-* reveals that variations on the word were used by two mothers, one father, and one grandmother, compared to eight traditional healers, four health providers, and in six of seven FGDs with RECOs. Health providers may perceive “neglect” by families, though the real reason for avoiding the health center usually had to do with financial difficulties. Such an interpretation may also have been self-protective; care for children under 5 was meant to be provided for free according to national policy, but health providers often required some payment for treatment.

Some health providers were somewhat more understanding of the financial barriers faced by families:

“The difficulty that families have is poverty first and foremost. ... If the child is sick, to bring it to the health center, there’s the terrible financial issue. It’s really a problem.” – Nurse, Bengamisa

Conversely, there was some mistrust in the opposite direction as well, directed from communities towards the “white man’s” medicine and other practices, customs, or items perceived as Western in origin. RECOs occasionally mentioned that families would hide their children during vaccination campaigns, refusing these “white man’s medicines that would destroy their children.” Whites were said to hide things in these vaccines that were bad for children, a view particularly held by grandmothers. However, while these sentiments were sometimes alluded to, they were rarely explicitly stated and were much less common than health providers’ comments about “*négligence*.”

Interviewer: When [the provider] counseled you, what did he say?

Mother of child 6–23 months, Bengamisa: Our service providers here don’t give us advice ... the child had a lack of blood. They just injected him with a vial to bring back his blood.



Photo by Kate Holt, MCSP.

Discussion

This study aims to understand the behaviors, perceptions, and beliefs around child illness and nutrition, and how these influence feeding and care-seeking practices in DRC, where stunting affects a significant proportion of children. This section includes summarized findings, discussions of the main gaps in child nutrition and health (Table 11), and suggestions to improve IYCF and strengthen the integration of nutrition into iCCM in DRC.

Children's Health, Growth, and Nutrition

Families conceptualize children's health, growth, and nutrition together, and recognize traditional and modern diseases with natural and spiritual etiologies. They expressed little differentiation among notions of children's health, growth, and nutrition. Healthy children were seen as those who ate well and "looked" well.

Conversely, sick children had no appetite, were ill, and showed signs of not growing well. The "integration" of nutrition into health and care seeking is already effective in households. Communities recognized both Western ("white man's") diseases and many local, traditional diseases. Sometimes these were said to be different names for the same symptom (e.g., convulsions and lonyama), but they were more often described as separate phenomena with a different etiology, expected care seeking, and cure/treatment.

Communities view breastfeeding as healthy and beneficial, but there are some health system barriers to early initiation. Overall, breastfeeding had a very good image among communities in the study. Mothers and families say breastmilk is the "best food" for babies and should be the only food children consume until they reach 6 months old. Mothers wished to continue breastfeeding for 2 years or longer. Most recognized the importance of the early initiation of breastfeeding, but there some barriers to engaging in this practice, such as the separation of mother and baby after delivery at the health center and the notion that if the child does not cry, s/he is not hungry yet and does not need to be fed. Health center workers told mothers to give the colostrum, which most mothers followed, but they were often unclear on the reason. A minority of mothers said this breastmilk was not "clean" due to its yellowish color.

The advice provided by health workers likely has a significant impact on infant feeding practices because according to DHS, a skilled birth attendant assists 80% of women nationwide in DRC in childbirth (the figure is 86% in Orientale Province)[20]. National figures for skilled birth attendance are lower for women with no education (68%) or primary school education (76%) and for rural women (74%)[20], which describes most of the women in the study.

Table 11. Main gaps identified in providing optimal care of child illness

Health System Level	Community Level
<ul style="list-style-type: none"> • Mother and child are separated postpartum, impeding early initiation of breastfeeding. • Nominally free care is not actually free. • Health providers give insufficient and/or ineffective counseling on nutrition and other topics. • Families not aware of availability of care (integrated community case management) at community level. • Suboptimal role of RECOs: <ul style="list-style-type: none"> • Undersupplied community care sites • Nutritional counseling not occurring and/or reaching families • Few household visits • Has a possibly disdainful attitude toward poor families. 	<ul style="list-style-type: none"> • Mothers initiate feeding early (before 6 months) due to leaving to work in the field. • Perception of insufficient quality and quantity of breastmilk can stigmatize mother's choices and lead to an end to breastfeeding before 2 years. • Belief that breastmilk can transmit disease/cause diarrhea. • Suboptimal complementary feeding: Small quantities of food are given, sugary/processed foods are consumed, difficulty in assessing number of meals. • Late or inappropriate care seeking by families is noted because of cost. • Communities feel shame around malnutrition.

Diminished quantity and quality of breastmilk can lead to illness in children. Families said quantity could be insufficient when mothers did not have enough to eat themselves and that quality could be affected by actions on the part of the mother, such as spacing too long between breastfeeding sessions, eating taboo foods, or infecting their babies with certain illnesses transmitted through breastmilk (e.g., *kunde*, a common illness of the breast that mothers can give to their babies). Mothers' need to farm interrupts breastfeeding, which leads to early introduction of foods and liquids before 6 months old (as early as 3 months old), as families give other foods to babies crying from hunger while mothers are away.

While Congolese children's diets include a variety of fruits and vegetables, complementary feeding practices are suboptimal concerning quantity of food given and number of meals consumed daily. Consumption of sweetened foods and beverages is a problem among young children.

Bouillie is the first food children eat. Other foods are then introduced progressively—first soft, and then harder foods (e.g., meat) once the child has teeth and a “more developed stomach.” Children generally are given fruits and vegetables, but sources of animal protein are often lacking. Children are given relatively small quantities of food daily. Given the difficulty of estimating meal frequency, children were likely not receiving enough food per day, particularly when mothers often appeared deprived of food, given that they frequently complained of hunger when breastfeeding. Children were often said to eat “whatever was available,” and there were few taboo foods (apart from game meat for children and breastfeeding mothers). Children were fed by all members of the family, most often by older siblings and other children living in the household, when the mother is off in the fields.

Many families may fail to recognize stunting because it is so common. Malnutrition may go unnoticed because families often compared children's size to others in their age cohort, whereas more than one-third of children in the community are likely to be stunted. Indeed, stunting often goes unrecognized in communities where short stature is the norm, as linear growth is not routinely assessed in primary health care settings and is difficult to recognize visually [21]. Families rarely spoke of their own children being acutely malnourished—which is unsurprising, as this is a rare occurrence—but they often were able to describe its severe signs: changes in hair and skin color, swollen limbs and cheeks, *kwashiorkor*, listlessness, etc. Furthermore, there is a suggestion in the data, also based on the interpretations of in-country data collectors, that malnutrition (especially severe forms like *kwashiorkor*) is considered a shameful condition (associated with poverty), and therefore a reason to hide the child rather than seek care.

When a child falls ill, families begin with home care and traditional medicine, avoiding a health care center unless required due to the associated expense. Families may seek modern and traditional treatment sequentially or at the same time. The choice of place for care seeking depends on the type of disease (traditional or modern), the severity, and especially the cost.

When children fall ill and basic home care does not result in improvement, families' first recourse is usually traditional healers, who provide diagnosis; plant-based, spiritual, and occasionally Western remedies; and referral to a health center if needed. Traditional healers are accessible to families because they live nearby, take appointments at any time, and are flexible about payment. They often disagree about which illnesses they are competent to treat, including malaria, pneumonia, diarrhea, and malnutrition.

RECOs refer and accompany families to the health center and may provide some basic care for uncomplicated cases if they have the supplies. They do not seem to be supplied with RDTs, which limits their ability to treat malaria. They appear to be underutilized based on families' reports of receiving counseling, diagnosis, or care from this cadre; because the community is misinformed, they are undersupplied or undertrained, or some combination.

Finally, families overwhelmingly said cost was a barrier to care seeking for childhood illness, a finding in line with those in the 2013–14 DHS, in which 69% of women said a problem with seeking care was “not enough money for treatment” (Table 12).

Table 12. Percentage of women ages 15–49 who had problems seeking care*

	Not Enough Money for Treatment (%)	Distance to the Health Center (%)	At Least One Problem* (%)
Place of residence			
Urban	58	21	66
Rural	75	30	82
Level of education			
None	80	49	85
Primary	75	45	82
Secondary	61	33	70
Orientale Province	74	46	79
TOTAL (n=18,827)	69	39	76

*Not all listed problems are shown here.

Source: 2013–14 DHS

Health providers perceived families as “careless” in not seeking care for sick children at health centers right away; mothers especially received the blame. They often referred to what they called families’ “carelessness” (*négligence*) or ignorance, when they failed to bring their children to the health center or follow medical advice. The disdain or shame thrown upon families was reminiscent of the description one traditional healer gave of malnourished children: these “are good children neglected by their parents.” More specifically, the blame was often on the mother, including for neglecting her child by working in the fields, leading to problems with breastmilk quality; nursing him/her with sweaty breasts, leading to diarrhea; infecting the child with *kunde*; and giving him/her diarrhea after eating inappropriate or taboo foods. Mothers and families more generally often appeared caught in a bind between conditions rendering them unable to provide good care for their children and being criticized for something they could not control.

While the study team collected data on food frequency, detailed 24-hour recall dietary data would have provided more information on nutrient intake for young children. The consumption of meals in large pots for families to share resulted in difficulties obtaining information on number of meals consumed daily and quantity of foods consumed by young children. Other limitations include that findings are only applicable to Tshopo Province, and that data were collected in the local languages of Swahili and Lingala but analyzed in French, potentially introducing errors of interpretation, though the study team tried to minimize these via close collaboration with DRC-based researchers, including in the study region.

Recommendations

The gaps in nutrition and iCCM services identified by this research provide indications for how to harmonize services and protocols for nutrition and iCCM, increase referrals, and integrate and strengthen the prevention and treatment of malnutrition among children under 5 at the facility and community levels in Tshopo Province in DRC. The integrated nutrition and iCCM package should build on study findings and on other learning and information gathered during the MCSP study.

The study identified social and economic barriers as primary influencers of optimal health and nutritional status of children under 5. While these are important for the Government of DRC to address in the future, the MCSP program recommendations are to strengthen and harmonize services and protocols for children under 5 at the facility and community levels through an integrated IMCI/iCCM/nutrition package. It is very important that child health and nutrition divisions in the MOPH at all levels work closely together.

Recommendations discussed below are for the national, regional, and program level.

National-Level Recommendations

- Review and revise guidance, curricula, and support materials to strengthen nutrition counseling for IYCF, including increasing dietary diversity, meal frequency, quantity of food consumed, and increased feeding of foods and liquids during and after illness for sick children, and integrating the management of SAM and MAM at community level. The country needs to strengthen the capacity of CHWs around IYCF counseling and in the management of SAM and MAM in the community, pending availability of supplies to treat acute malnutrition.
- Review, adapt, and revise existing SBCC materials to support optimal IYCF practices and to counsel on challenges that mothers and families face. These challenges include the separation of mother and baby immediately after delivery, perceptions of insufficient breastmilk, maintaining breastmilk supply, early introduction of foods and liquids before 6 months old, weak complementary feeding practices, and feeding practices during and after child illness, which can be conducted through well-child clinic consultations at under-5 clinics and community-based activities.
- Advocate to strengthen nutrition within iCCM. All stakeholders at the national level should also advocate with national leaders to prioritize:
 - Funding for children's health and nutrition to strengthen nutrition and child health interventions at facility and community levels
 - Adequate funding for and the strengthening of SSCs and CHWs
 - Adequate and reliable supplies of quality equipment, commodities, and drugs for facility and SSCs
 - The integration of IYCF and the management of MAM and uncomplicated SAM cases at SSCs

Provincial- and Health Zone-Level Recommendations

- Disseminate the new national iCCM/nutrition policies and guidelines to strengthen IYCF counseling and management of MAM, and strengthen the capacity of CHWs and health providers in managing MAM and SAM.
- Strengthen health provider capacity (including that of RECOs) through training on IYCF, IMCI/iCCM, and treatment of MAM and SAM.

- Equip health workers with updated SBCC materials, including key culturally relevant messages and illustrated counseling cards on IYCF practices, such as feeding during and after illness.
- Strengthen the preventive components of nutrition with iCCM, using the adapted counseling cards to assure facility- and community-based health workers are well equipped and trained to:
 - Avoid separation of mother and baby after delivery, and assure early initiation of breastfeeding.
 - Counsel on early introduction of foods before 6 months old and how it disrupts EBF practices.
 - Counsel and provide support on breastfeeding challenges, including on perceptions of insufficient breastmilk linked to child/maternal illness, maintaining breastmilk supply, and expressing breastmilk during periods the mother is away.
 - Counsel on appropriate complementary feeding practices, with an emphasis on quantity, diversity, and frequency of foods to give to children 6–23 months old.
 - Counsel caregivers on feeding children during and after illness.
- Develop or collect local complementary feeding recipes to improve practices based on readily available local foods and cultural beliefs around these foods to increase dietary diversity, quantity of food consumed, frequency of meals, and protein intake. Use recipes during cooking demonstrations conducted through mother-to-mother support groups.
- Strengthen the quality of services and improve counseling on IYCF practices during contacts with caregivers, including well-child visits, sick-child visits (within the context of case management), and community-level contact points (including home visits).
- Strengthen and maintain the skills of facility- (nurses) and community-based providers (RECOs) through supportive supervision and updated curricula.
- Target and strengthen engagement with key influencers, including grandmothers, fathers, traditional healers, and other influential members of the community, to encourage good IYCF practices. Capitalize on/use existing community groups or establish mother-to-mother and community support groups to maximize community reach. Work with and support community organizations to create or strengthen community groups.
- Explore innovative ways to work alongside traditional healers. Health management teams should explore how they can facilitate and rationalize referral, encourage the dispensing of ORS/zinc for simple cases of diarrhea, and provide nutrition advice for certain key IYCF practices, such as breastfeeding messages.
- Ensure consistent supply of supplementary foods for treatment of MAM and SAM by liaising with PRONANUT and other implementing partners, and advocating for a steady supply at facility and community levels.

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Annex I. Availability of Foods by Site, Season, and Source

	Bengamisa (A) ⁸	Yakusu (B)	Yaleko (C)	Ubundu (D)
Foods available year-round	<ul style="list-style-type: none"> Rice, plantains, cassava, fufu, sweet potatoes <i>Sombé</i> (cassava leaves), sweet potato leaves, spinach, onions, other vegetables, amaranth leaves, <i>mbosu</i> (vegetable) Fish, meat, beans 	<ul style="list-style-type: none"> <i>Sombé</i>, sweet potato leaves, spinach, amaranth Cassava, rice, <i>lituma</i> (cassava and plantain), potatoes, corn fufu, plantains Fresh fish, dried fish, salted fish, domesticated and game meat and fowl Vigna and other beans Mushrooms 	<ul style="list-style-type: none"> <i>Sombé</i>, sweet potato leaves, spinach, <i>makoloni</i> (wild vegetable – <i>M. macrostachyum</i>) Rice; fufu from corn, plantain, and cassava; potatoes; amaranth Snails, fish, meat, wild rat, vigna beans Mushrooms 	<ul style="list-style-type: none"> Cassava, rice, fufu (from corn and cassava), amaranth, bread, <i>lituma</i> <i>Sombé</i>, sweet potato leaves Meat, fish, salted fish, dried sardines, duck Peanuts
Available in the dry season	<ul style="list-style-type: none"> Cassava, corn Insect larvae, dried and fresh meat, fish Pineapples <i>Sombé</i>, sweet potato leaves, spinach Pili (hot pepper) 	<ul style="list-style-type: none"> Fresh fish, dried sardines, game meat, snails <i>Sombé</i>, sweet potato leaves, amaranth Mushrooms Cassava, potatoes, rice, fufu, <i>chikwange</i> 	<ul style="list-style-type: none"> <i>Sombé</i>, <i>makoloni</i> Rice, <i>lituma</i> Meat, fish, vigna beans Mushrooms 	<ul style="list-style-type: none"> Fish <i>Sombé</i>, <i>matembele</i> (sweet potato leaves) Fufu, plantains, taro root, cassava, sweet potatoes, potatoes, corn
Available in the rainy season	<ul style="list-style-type: none"> Rice, cassava, <i>lituma</i> Spinach, <i>sombé</i>, sweet potato leaves, <i>mbochi</i> (vegetable) Fish, meat, caterpillars (fresh or dried), snails Palm oil, palm wine 	<ul style="list-style-type: none"> <i>Sombé</i>, amaranth, tomatoes, spinach, eggplants, sweet potato leaves Fish, meat (wild and domesticated), insects, snails, caterpillars (fresh or dried) Kola nuts Wild mushrooms Cassava, corn, rice 	<ul style="list-style-type: none"> <i>Sombé</i>, spinach, <i>makoloni</i>, sweet potato leaves, amaranth Snails, fish, insects (<i>bilulu</i>), meat Cassava, <i>lituma</i> Vigna beans Mushrooms 	<ul style="list-style-type: none"> <i>Sombé</i>, spinach, amaranth, sweet potato leaves Rice, cassava Snails (large and small varieties), fish, meat Sweet potatoes, corn, ripe plantains Peanuts Mushrooms

⁸ Letters have been used in the data set to identify these health zones and can be found in quotes throughout the report.

	Bengamisa (A) ⁸	Yakusu (B)	Yaleko (C)	Ubundu (D)
Farmed	<ul style="list-style-type: none"> • Cassava, rice, corn • Sweet potato leaves, spinach, amaranth, eggplants, avocados, <i>mbochi</i> • Tomatoes, papaya, oranges, coconuts, pineapples, ripe bananas • Sugarcane • Peanuts, sunflowers • Hot peppers 	<ul style="list-style-type: none"> • Rice, cassava, sweet potatoes, taro root, corn, plantains, yams • Bananas, papaya, tomatoes • Sweet potato leaves, avocados, eggplants, spinach, squash • Beans • Hot peppers 	<ul style="list-style-type: none"> • Corn, rice, cassava, sweet potatoes, potatoes, plantains, yams • <i>Sombé</i>, spinach, amaranth • Vigna beans, peanuts • Bananas, tomatoes, pineapples • Sugarcane • Hot peppers 	<ul style="list-style-type: none"> • Rice, cassava, corn, sweet potatoes, taro root, plantains • Amaranth, spinach, amaranth leaves, eggplants, <i>sombé</i> • Bananas, tomatoes • Peanuts, squash seeds • Vigna beans • Hot peppers
Fished	<ul style="list-style-type: none"> • Fish: tilapia, and other kinds of fish (<i>alongosa</i>, <i>alobela</i>, <i>lipale</i>, etc.) 	<ul style="list-style-type: none"> • <i>Mukila</i> fish, <i>falaka</i> (small fish found in streams), <i>ngonda</i> (eel), crocodile, <i>mbotu</i> (large fish), smoked fish 	<ul style="list-style-type: none"> • Fish, eelfish, <i>likoki</i> fish, <i>faha</i> fish, shrimp, electric fish, and <i>botolo</i> and <i>lifofolifo</i> fish 	<ul style="list-style-type: none"> • Fish, crocodile, eelfish, crabs, sardines, shrimp (<i>kosakosa</i>), small snails, other small fish
Hunted	<ul style="list-style-type: none"> • Rat, squirrel, porcupine, chimpanzee, porcupine, Gambia rat (<i>C. emini</i>), wild cow (<i>ndee masuwa</i>) 	<ul style="list-style-type: none"> • Antelope, pangolin/anteater, crocodile, snake, squirrel, tortoise 	<ul style="list-style-type: none"> • Cat, boar (<i>ndeli/sombo</i>), wild pig, elephant, squirrel, antelope, wild cow, wild goat, monkey, jackal, small wild rat, porcupine, wild birds 	<ul style="list-style-type: none"> • Antelope, <i>lombe</i> (large aquatic edible lizard), wild rabbit, other kinds of bushmeat
Bred/raised	<ul style="list-style-type: none"> • Pigs, chickens, ducks, goats, sheep 	<ul style="list-style-type: none"> • Pigs, chickens, goats, ducks, sheep 	<ul style="list-style-type: none"> • Pigs, chickens, ducks, goats, sheep 	<ul style="list-style-type: none"> • Ducks, chickens, pigs
Available at the local market	<ul style="list-style-type: none"> • Meat (fresh, dried, and prepared), bushmeat (e.g., antelope, squirrel), fish (fresh, dried, and salted), pigs • Flour, <i>fufu/chickwange</i> (prepared and wrapped), plantains, potatoes • <i>Sombé</i>, sweet potato leaves, tomatoes, hot peppers 	<ul style="list-style-type: none"> • Meat, fish (fresh, dried, salted, and fish) • Rice, cassava, <i>fufu</i> • Peanuts • Oil • <i>Sombé</i>, sweet potato leaves, spinach 	<ul style="list-style-type: none"> • Fish (fresh and salted), bushmeat, meat from domesticated animals and birds, live chickens • <i>Sombé</i> • Rice • Mushrooms • Peanut butter (<i>lotoba</i>) 	<ul style="list-style-type: none"> • Meat (from domesticated or wild animals), shrimp (fresh or dried), fish (fresh, salted, or dried) • Sweet potato leaves, spinach, amaranth, garlic, onions, tomatoes • Rice, plantains, hot peppers • Oil