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The Ready-to-Use Therapeutic Food Supply Chain in the Democratic Republic of the Congo

Analysis and Recommendations for Strengthening Last Mile Delivery in Kasai Oriental and Nord Kivu Provinces



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COVER PHOTO: Gwenn Dubourthoumieu

PHOTO CAPTION: A child receives treatment with ready-to-use therapeutic food (RUTF) at a Unité Nutritionnel Thérapeutique Ambulatoire (Ambulatory Therapeutic Nutrition Unit) in Sud Kivu province in the DRC.

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ACRONYMS

ACF	Action Contre la Faim
AMC	annual monthly consumption
ASRAMES	Association Régionale d'Approvisionnement en Médicaments Essentiels (Regional Essential Drug Supply Association)
BCZ	<i>bureau central de la zone de santé</i> (health zone central office)
BHA	Bureau for Humanitarian Assistance
CDR	Central d'Achat et de Distribution des Médicaments Essentiels Génériques (Central Purchasing and Distribution of Essential and Generic Drugs)
CMAM	Community-based management of acute malnutrition
DHIS-2	District Health Information System 2
DPS	Direction Provinciale de la Santé (Provincial Department of Health)
DRC	Democratic Republic of the Congo
F-75	formula-75
F-100	formula-100
GNC	Global Nutrition Cluster
HRP	Humanitarian Response Plan
IMAM	Integrated Management of Acute Malnutrition
IPC	Integrated Food Security Phase Classification
IYCF	infant and young child feeding
JSI	JSI Research & Training Institute, Inc.
MAM	moderate acute malnutrition
MICS	Multiple Indicator Cluster Survey
MOH	Ministry of Health
MSF	Médecins Sans Frontières
MSPHP	Ministère de la Santé Publique, Hygiène et Prévention
MUAC	mid-upper arm circumference
NGO	nongovernmental organization

PCA	Programme Cooperation Agreement
PRODOC	Programme Document
PRONANUT	Programme National de Nutrition (National Nutrition Program)
PUI	Première Urgence Internationale
RECO	<i>relais communautaire</i> (community volunteer)
RUTF	ready-to-use therapeutic food
SAM	severe acute malnutrition
SDC	Social Development Center
SIGL	Système d'Information en Gestion Logistique (Logistics Information Management System)
SMART	Standardized Monitoring and Assessment for Relief and Transition
TWG	technical working group
UN	United Nations
UNHAS	United Nations Humanitarian Air Service
UNICEF	United Nations Children's Fund
UNTA	Unité Nutritionnelle Thérapeutique Ambulatoire (Ambulatory Therapeutic Nutritional Unit)
UNTI	Unité Nutritionnelle Thérapeutique Intensive (Intensive Nutritional Therapeutic Unit)
USAID	U.S. Agency for International Development

EXECUTIVE SUMMARY

In the Democratic Republic of the Congo (DRC), the large numbers of children with severe wasting have led to an increased demand for ready-to-use therapeutic food (RUTF), the product used to treat children in outpatient care (IPC 2022). As part of efforts to understand and document the last mile delivery of this lifesaving product to health facilities in the DRC, USAID Advancing Nutrition studied four U.S. Agency for International Development (USAID)-supported RUTF pipelines. Using a mixed-methods approach, we sought to answer key research questions related to pipeline structure and cost, stock availability, and key challenges. We found that all pipelines faced problems with stockouts and transportation. Key informants highlighted several important opportunities for strengthening the pipelines, such as assessing the national supply chain's readiness to integrate RUTF, improving RUTF donor coordination, and expanding the role of the Nutrition Cluster in supply chain management.

BACKGROUND

USAID Advancing Nutrition has been supporting the USAID Bureau for Humanitarian Assistance (BHA) and the USAID Mission in the DRC since 2019 to understand the challenges facing nutrition stakeholders who are responsible for delivering wasting treatment and prevention services. As part of its ongoing support to document wasting services in the DRC, USAID Advancing Nutrition previously identified ongoing challenges with the RUTF logistics system in some health zones in Kasai Oriental and Sud Kivu provinces that are receiving support from USAID. Some of the main challenges and potential bottlenecks in the logistics system we identified included—

- highly variable availability of RUTF at health facilities, possibly driven by supply chain pipeline type
- variable contract periods with partners responsible for the last mile delivery of RUTF, depending on the donor (e.g., United Nations Children's Fund [UNICEF] or BHA)
- different partner processes for planning for RUTF needs, with local officials largely excluded

- existence of several systems for tracking RUTF supplies but a lack of clarity about whether and how they are integrated or how the data are used for RUTF supply planning and management (USAID Advancing Nutrition 2022).

Given these previously identified challenges and marked differences in performance across the health zones, it was determined that more information was needed to understand what was driving these performance differences, as well as potential cost and program outcome implications that may be related to variability in pipeline structure and delivery mechanisms.

DEFINITION OF SUPPLY CHAIN PIPELINE

A supply chain “pipeline” refers to “the entire chain of physical storage facilities and transportation links through which supplies move from the manufacturer to the user, including port facilities, central warehouse, regional warehouses, district warehouses, all service delivery points, and transport vehicles (John Snow, Inc. 2020).

METHODOLOGY

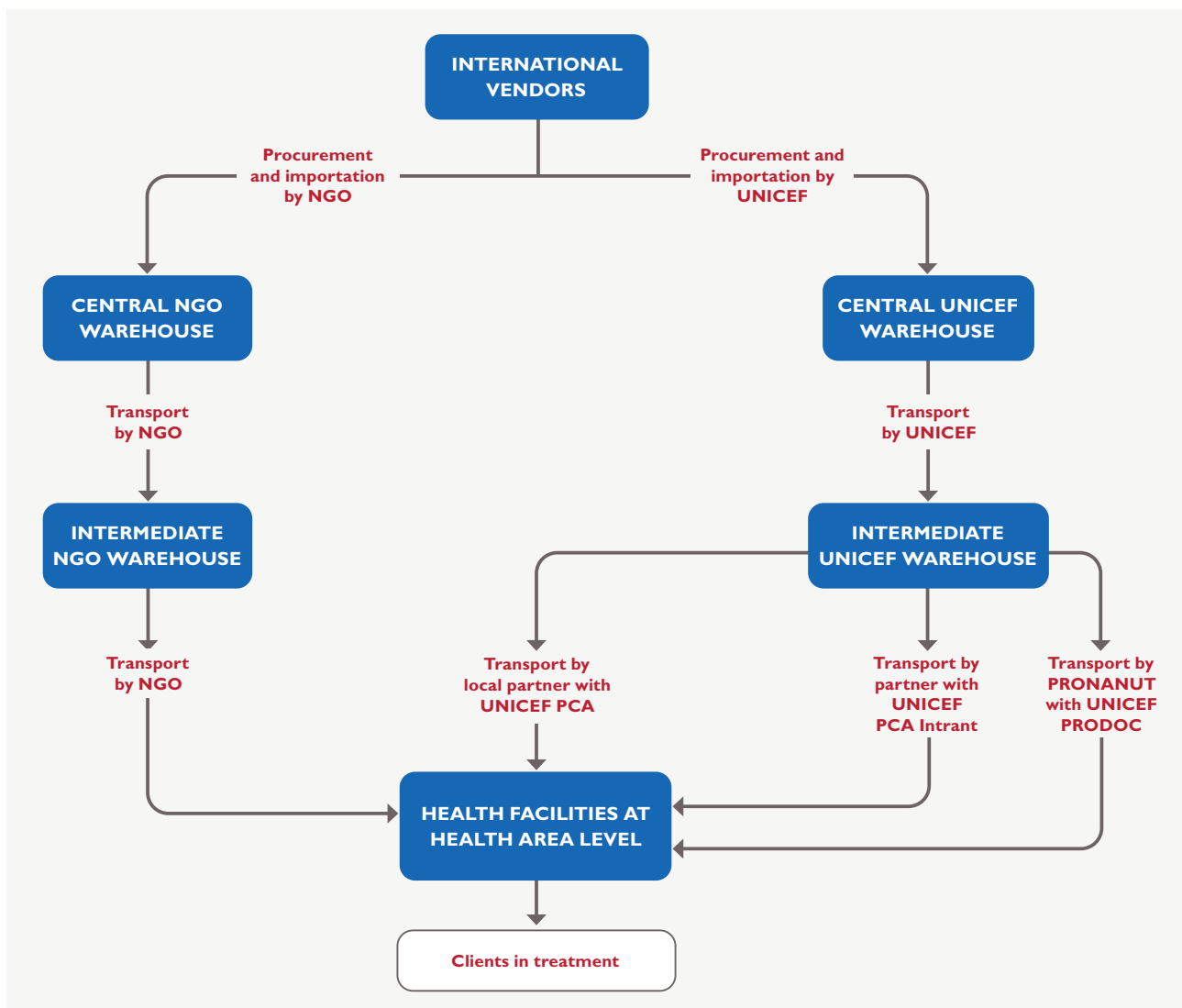
This study investigated four RUTF pipelines that we had identified as part of our previous work. Each of these pipelines may receive either direct or indirect¹ support from USAID. For three of the pipelines, UNICEF is responsible for the procurement, import, and distribution of RUTF from central warehouses to the provinces. The last mile delivery of the RUTF is then conducted in one of three ways: by an implementing partner financed by UNICEF through a Programme Cooperation Agreement (PCA); by an implementing partner who received in-kind RUTF for distribution through a PCA Intransit (supply-only agreement); or by a government actor, such as Programme National de Nutrition ([PRONANUT]; National

1. USAID provides funding to UNICEF to support wasting prevention and treatment services. For the purposes of this study, USAID Advancing Nutrition assumes that pipelines that are under UNICEF's responsibility receive some level of “indirect” support from USAID.

Nutrition Program), as part of a Programme Document (PRODOC) signed between UNICEF and the government. The final pipeline type we examined is supported by an international nongovernmental organization (NGO), with direct financing

from BHA to procure, import, and distribute RUTF, usually as part of a larger package of support to severe wasting treatment services. These pipelines are illustrated in figure ESI.

Figure ESI. Structure of Pipelines for USAID-Supported Last Mile Delivery of RUTF



All sampling for this study was purposive. In total, we visited 27 health areas and conducted 73 key informant interviews. We also visited 43 RUTF storage facilities (e.g., regional/province/health zone-level warehouses and health facility depots) to review stock records and/or complete the quantitative data collection. We conducted key informant interviews with health facility staff, government, implementing partners, and United Nations (UN) entities at all levels of the supply chain to learn about the structure of the pipelines, stock management procedures, transportation and logistics, procurement planning and contract procedures, key cost drivers, and perceived challenges and opportunities. We also conducted in-person warehouse visits and stock record reviews.

FINDINGS

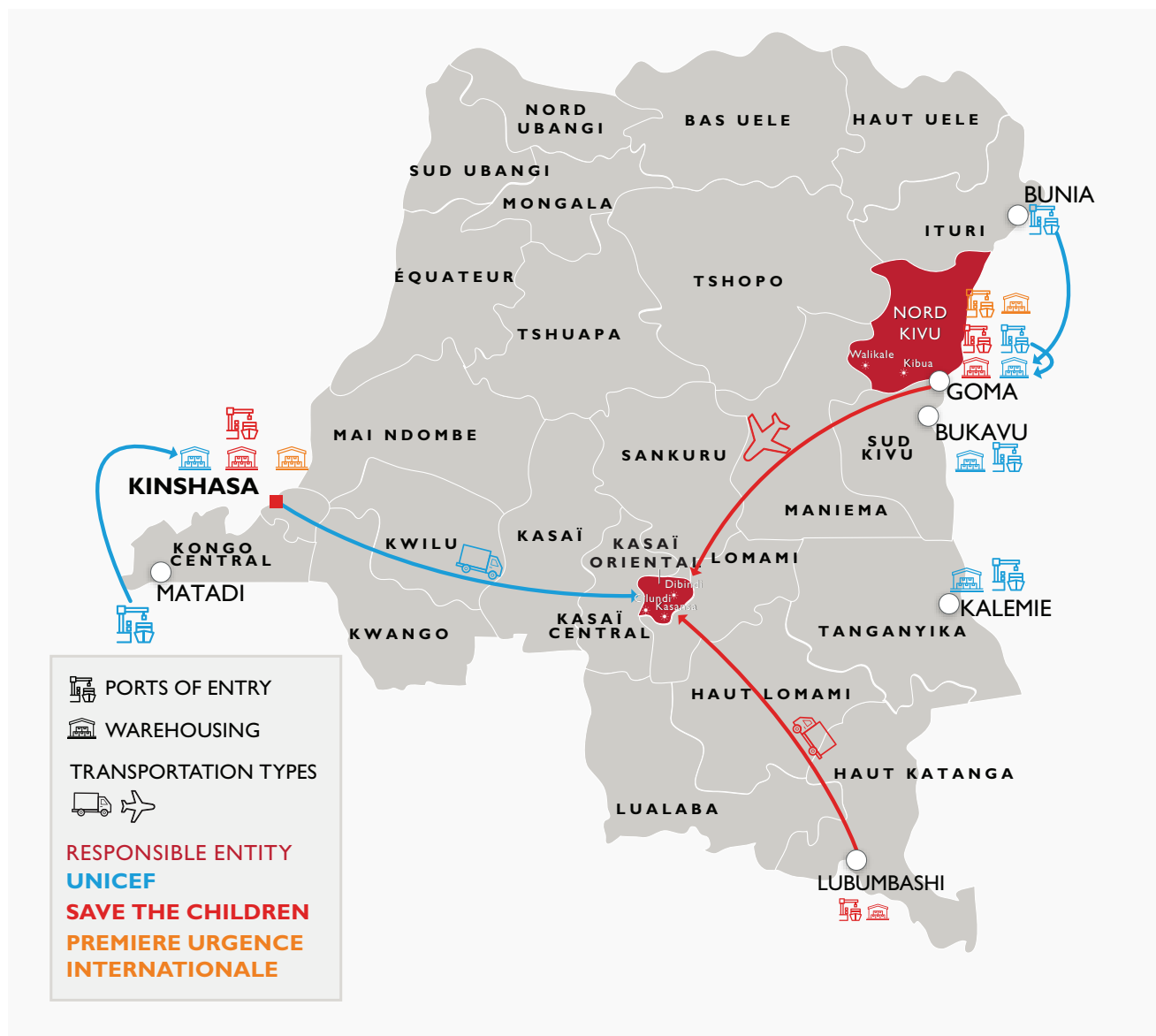
Our findings are presented in four sections. First, we provide a description of each of the examined RUTF pipelines, based on explanations of key processes by key informants at all levels of the health system. We then present an analysis of pipeline performance, based on qualitative and quantitative information on supply availability and stockouts. We discuss cost drivers for the various pipelines and issues affecting the ability to cost each pipeline. Last, we discuss the underlying challenges identified by key informants that may be contributing to RUTF stockouts.

Description of RUTF Pipelines

The pipeline descriptions are based on information shared with us by key informants at national, province, health zone, and health area levels. We provide both a description of key processes as reported by the UN, government, or implementing partner agency, and the perspectives of the health zone and health area staff to provide a comprehensive picture of how each pipeline is functioning.

The three RUTF importers that we examined—UNICEF, Save the Children, and Première Urgence Internationale (PUI)—had similar lead times for RUTF importation, at around six months. Whereas UNICEF is exempt from import tax and other requirements, both Save the Children and PUI have experienced significant challenges with importation procedures and protracted pending exemption requests. The flow of products from the central warehouses of these partners to the provinces, health zones, and health areas varied greatly, as illustrated in figure ES2.

Figure ES2. Summary of Central Warehouses and Ports of Entry for Importing Partners



In terms of stock management procedures, information from facility-level key informants in Kasai Oriental was generally more robust compared with Nord Kivu. Generally, most facility-level informants confirmed that they sign a delivery note or receipt when they receive stock and they update their stock cards when new supplies are received. All facilities mentioned some type of reporting system, with the majority confirming

that they send monthly reports to the health zone central office (*bureau central de la zone [BCZ]*), which then tends to compile and share these reports with the supporting partner and/or PRONANUT or UNICEF. Table ESI summarizes some of the facility-level stock management procedures mentioned by the key informants.

Table ESI. Summary of Facility-Level Stock Management Procedures by Health Zone, Mentioned by Key Informants

	Kasaï Oriental			Nord Kivu			Total Service Delivery Sites
	CilunduSave the Children–NGO Procurement	DibindiSocial Development Center–PCA	KasansaSave the Children–NGO Procurement	Goma No Defined Partner/ Pipeline Support	Kibua PUI–NGO Procurement	Walikale PRONANUT–PRODOC	
Count stock on arrival	2/5	3/6	4/6	0/4	0/4	0/5	30% (9/30)
Sign a delivery note and/or have a receipt slip	5/5	5/6	6/6	2/4	2/4	1/5	70% (21/30)
Update stock sheets on arrival	3/5	6/6	4/6	4/4	2/4	1/5	67% (20/30)
Require a supply requisition to take stock out of depot	3/5	6/6	5/6	1/4	2/4	1/5	60% (18/30)
Use client-based stock monitoring tools (e.g., cross-reference with client cards or keep a consumption book)	4/5	5/6	5/6	1/4	2/4	2/5	63% (19/30)
Facility staff involve community in receiving stock (e.g., unloading or signing delivery slip)	1/5	2/6	3/6	1/4	1/4	0/5	27% (8/30)
Complete weekly reports, inclusive of stock data	0/5	6/6	2/6	0/4	4/4	0/5	27% (8/30)
Complete monthly reports, inclusive of stock data	4/5*	6/6	5/6	4/4	4/4	3/5**	87% (26/30)
Average number of procedures mentioned by facility staff	4/7 (57%)	4.5/7(69%)	4.8/7 (69%)	2.25/7 (32%)	3/7 (43%)	1.2/7 (17%)	3.43/7 (49%)

* All facilities mentioned sending reports to the BCZ, but one did not specify the frequency.

** All visited facilities mentioned sending reports to the health zone, but only three of the five specifically mentioned that it was done monthly. However, it is likely that all five do actually report on a monthly basis.



PHOTO CREDIT: GWENN DOUBOURTHOUMIEU

Many roads throughout DRC become impassable during the rainy season, presenting significant challenges to ensuring a reliable supply of RUTF to health areas.

Pipeline Performance

We defined pipeline performance based on the reliability of supply provision by the partners and the availability of RUTF at the visited health facilities. We assessed each health zone pipeline using a quantitative tool to gather data on key indicators, such as rates of stockouts on the day of the visit, stockouts according to records, and whether the quantity received is equal to the quantity ordered. Table ES2 summarizes the findings from our record review and staff recall on stockouts.

As illustrated in table ES2, according to the quantitative data that we collected, all health zones had sites that experienced stockouts in the past six months. In terms of overall

performance, based on the fewest number of stockouts in the past six months, facilities supported by Save the Children in Cilundu and Kasansa fared the best. Although not all stock records were complete, based on available records, the Save the Children-supported facilities in Cilundu had the shortest stockout periods. Although the supported sites experienced stockouts, PRONANUT-supported Walikale health zone also seemed to perform reasonably well by comparison, being one of just two health zones (the other being Cilundu) where none of the visited sites were stocked out on the day we visited. Goma health zone, which has no dedicated partner (e.g., implementing partner or UNICEF) support, unsurprisingly fared the worst across all areas we investigated.

Table ES2. Summary of Stock Record Review Data and Stockout Recall by Health Zone²

Indicator	Kasaï Oriental			Nord Kivu			All Health Zones
	CilunduSave the Children–NGO Procurement	DibindiSocial Development Center–PCA	KasansaSave the Children–NGO Procurement	GomaNo Defined Partner/ Pipeline Support	Kibua PUI–NGO Procurement	Walikale PRONANUT–PRODOC	
Staff recall stockout in previous six months	3/5	5/5	2/5	3/3	3/3	5/5	81% (21/26)
Of facilities that had updated stock cards, number that showed stockout in the previous six months	3/5	5/5	1/4	1/1	3/3	5/5	78% (18/23)
Stocked out on the day of the visit	0/5	2/5	2/5	3/3	2/3	0/5	35% (9/26)
Have records indicating that the facility has less than one month of stock left (including 0)	3/5	5/5	5/5	3/3	3/3	5/5	92% (24/26)
Throughput of RUTF sachets recorded over previous six months (range)	4,663–9,700	20,938–35,039	5,057–12,296	2,100–2,550	3,518–6,575	5,206–20,741	41,482–86,901
Number of days recorded as stocked out over previous six months (range)	5–12	27–93	28 ³	44 ⁴	27–109	19–62	-
Number of months of data available on stock cards in the previous six months (range)	6	4–6	3–6	2–4	6	5–6	-
Percentage of time for which the facility had records over the previous six months showing it was stocked out (range)	3%–7%	15%–72%	31%	37%	15%–61%	11%–41%	-

2. The table is shaded in a three-tier “stop light” pattern to assist in the interpretation of the indicator results. Differences among the colors are based on our subjective assessment of the scores in each area. Throughput is not scored because it is not itself good or bad, but instead is an indicator of the relative importance, in terms of reported consumption of RUTF, of the different health zones. We also assess the degree of stockouts using both staff recall and stock records to get a sense of the scale of the problem. However, indicators that rely on stock record data should be interpreted with caution because several facilities had incomplete stock records and, therefore, it was hard to know what was happening during those periods. We did not include months with no data as part of our analysis; these estimates may therefore be a conservative estimate of the actual amount of time that the facility was stocked out over the period analyzed.

3. Of the five facilities visited in Kasansa, two were stocked out at the time of the visit, but only one of the five had detailed stock records available for review.

4. Although all three facilities in Goma were stocked out at the time of the visit, like Kasansa, only one of these facilities had detailed stock records available for review.



PHOTO CREDIT: GWENN DOUBOURTHOUMIEU

Women wait outside a health center in Bunia, DRC.

Pipeline Cost Drivers

The unpredictable and variable nature of the transport of RUTF, including frequency of delivery and mode of transportation, made it impossible for us to determine the different costs of transportation for the various RUTF pipelines examined as part of this exercise. The cost of air freight, despite it being named the fastest method of transportation, was consistently said to be cost prohibitive and used sparingly. Surprisingly, no one mentioned the cost of RUTF itself as a barrier to ensuring adequate supply. Instead, informants framed the challenge as a general lack of funding to support wasting treatment for all children who need it.

Although a detailed costing analysis was not possible in the scope of this activity, we were able to examine differences in key cost drivers among pipelines to explore whether there might be important differences in their cost structures. We looked at whether partners delivered supplies all the way to the facility or if health facilities had to collect them, the method of transportation used, and frequency of supply. All partner-supported pipelines (PCA, PRODOC, and NGO direct procurement) deliver RUTF supplies all the way to the health facility level. The only exception among the health facilities visited was Bilobilo health facility in Walikale, served

by the PRODOC pipeline, whose staff reported that they sent someone to collect supplies by motorbike to a location 30 km away. However, Bilobilo informants also reported that the health facility normally had other reasons to make these trips, and did not make them exclusively for the purpose of collecting RUTF supplies. In Goma health zone, where there is no partner support, all four health facilities reported that they had to collect their supplies. Supplies were not delivered by a partner to the facility, although three of the four health facilities reported that they collected supplies while making a trip for other reasons.

In terms of method of transport, the use of a 4x4 vehicle was the most common. This varied by pipeline type, with all Save the Children-supported facilities reporting that a 4x4 vehicle was used, whereas in Dibindi, which is supported by SDC through a PCA, supplies arrive by public transportation (bush taxi or bus). Transportation was the most varied in the Nord Kivu health zones, including 4x4 vehicles, motorbikes, car, bicycle, and cart (pushcart or donkey cart). Frequency of resupply did not seem to have a clear correlation with supply chain performance.

Underlying Challenges Affecting RUTF Availability

Stockouts of RUTF are clearly a challenge for all health areas and health zones visited and, based on information shared by individuals at the provincial and national levels, these problems are not unique to the sites we visited. Some of the main challenges key informants felt were contributing to the unreliable supply of RUTF include the following:

- **Transportation infrastructure:** Problems with transportation, specifically poor infrastructure, were by far the most common challenges mentioned by key informants across all levels of the system and all geographic areas. Eighty-four percent of informants (61 of 73) stated that transportation was a challenge. More than half that number specifically mentioned the poor state of the roads and stated that, in the rainy season, many places become inaccessible. Another common challenge mentioned related to transportation was the lack of vehicles or the use of vehicles inappropriate to the conditions. Last, in Kasai Oriental, there was mention of poor coordination between health facilities and implementing partners to plan RUTF deliveries.
- **Warehousing infrastructure:** The topic of warehousing infrastructure was often brought up, alongside transportation-related challenges. When mapping the various RUTF pipelines, we noted that one of the common reasons that supplies travel directly from a central or regional warehouse to the health areas is because health zones do not have adequate or appropriate storage space for the supplies. A lack of storage capacity at the health area level was also mentioned as a challenge by key informants. Limited storage space means that partners are less able to supply facilities for longer periods (e.g., quarterly rather than monthly) or pre-position stock in advance of periods of inaccessibility. A lack of relay depots also contributes to these challenges in areas with many inaccessible health areas.
- **Low treatment coverage and inadequate funding:** There is not enough funding available to provide RUTF to all children who need it, regardless of whether it could be efficiently and reliably delivered. A key informant from the Nutrition Cluster estimated that only about 30 percent of the DRC's health zones are covered by a "nutritional care package" that ensures a continuum of care not only for severely wasted children but also for moderately wasted children. Severe underfunding of the nutrition response

in the DRC is likely contributing to difficult targeting decisions. Of the \$258.6 million required for the nutrition portion of the Humanitarian Response Plan (HRP), only 35 percent was received (\$89.2 million). These figures represent funding for the entire nutrition response, not just funding required for the provision of RUTF, meaning that funding available for severe wasting treatment represents only a fraction of the \$89.2 million received (GNC/UNICEF 2023).

Opportunities for Strengthening

As part of our discussions with key informants, we asked them to tell us what they would like to see change in the RUTF supply chain and to identify actions that would help strengthen it. Suggestions coalesced around the following themes:

- **Involvement of government and facility-level staff in planning.** Government informants at all levels, including the Direction Provinciale de la Santé ([DPS]; Provincial Department of Health), PRONANUT, BCZs, and facility-level staff, overwhelmingly wanted to be more involved in the planning for RUTF procurement and delivery. A range of requests were made related to the planning process, from being involved in the selection of a reliable RUTF supplier to simply being able to place orders that are respected by the partners.
- **Infrastructure improvement.** Echoing the challenges highlighted earlier, key informants requested that improvements be made to key infrastructure, including roads, air service availability, and warehouses. In terms of improving the roads, key informants acknowledged that this is not the responsibility of the nutrition sector, even though such improvements would greatly improve the reliability of RUTF supply and ease transportation costs. Both UNICEF and implementing partner key informants expressed a desire to better integrate RUTF in the government warehousing system, preferring for stocks to be held at province and health zone-run warehouses rather than in parallel warehousing systems. It was also mentioned that better warehousing infrastructure could enable quarterly rather than monthly distributions, better pre-positioning of stock, and the ability to hold buffer stocks closer to health areas.
- **Integration in and strengthening of government supply chains.** Key informants proposed integrating RUTF in the Central d'Achat et de Distribution des Médicaments

Essentiels Génériques ([CDR]; Central Purchasing and Distribution of Essential and Generic Drugs) system and creating a larger role for the DPS, which could direct the CDR to procure RUTF, as it does with other essential medicines and supplies.

- **Creation of common RUTF stock.** UN-affiliated key informants expressed a need for more flexible RUTF supplies, including buffer stock. Informants explained that there are restrictions on how inputs purchased by specific donors can be used, limiting the ability of UNICEF to use supplies from one donor to meet unexpected needs in an area supported by another donor. The need for a national strategy to facilitate better stock coordination was expressed by one of these informants.

DISCUSSION

Our analysis has detailed the highly variable and unpredictable ways that RUTF makes its way from international producers to health areas in the DRC.

There was quite a bit of variability in the structure of the pipelines in terms of the frequency of delivery, types of transportation used, and the warehousing structure. In many instances there was even variability within the same pipeline, depending on the season and unforeseen circumstances (e.g., insecurity, vehicle breakdowns). It was difficult to draw clear conclusions about which structure performed best. However, we did note that the use of the BCZ (health zone) warehouse in Cilundu as a holding place for RUTF before its distribution to the health facilities seemed to have benefits not only in terms of reduced stockouts at the facility level but also in terms of positive perceptions of the supply chain performance by government stakeholders.

The previously-mentioned variability in the pipelines and in some cases ad hoc nature, made it impossible to do any kind of direct cost comparison among the pipelines. Frequency of delivery and the mode of transportation used were not consistent enough for us to estimate average costs. However, both aspects are important overall cost drivers.

In terms of assessing supply chain performance, although one pipeline—RUTF imported by Save the Children—performed slightly better than the others, all pipelines faced problems with stockouts and low stock levels in their warehouses at the time of our site visits (e.g., having less than one month of stock on hand).

The almost universally cited challenge to RUTF delivery, according to our key informants, was transportation. Extremely poor infrastructure makes many areas inaccessible during the rainy season, and a lack of adequate road and air transportation options restricts the frequency of deliveries and the quantities of RUTF that can be delivered. Insecurity in some areas only adds further complexity by necessitating extensive and sometimes international detours to safely deliver products. Because transportation is so unpredictable, it was not possible for us to determine specific cost differences among the pipelines. It was also not surprising that several informants highlighted challenges with adequately planning and budgeting for transportation under these circumstances.

Our findings are consistent with other recent globally focused RUTF studies. One study noted that RUTF is a “bulky” product, posing challenges to existing health infrastructure to transport and store appropriately (Mates and Sadler 2020). Another recent effort to understand RUTF access posited that the biggest barrier to RUTF access was financing. It was estimated that current financing for RUTF covers, at most, 25 percent of global needs (R4D 2021). This work also noted that most funding for RUTF comes from humanitarian sources despite the higher wasting burdens in non-humanitarian settings, and calls for increased financing from all sources and better national-level coordination on nutrition budgets. This is similar to the requests we heard from some key informants to better coordinate and even pool resources for RUTF to ensure that all areas have access to available supplies, especially in cases of unforeseen emergencies or stockouts.

RECOMMENDATIONS

The challenges facing the RUTF supply chain in the DRC are complex and are not solvable by the nutrition sector alone. However, several opportunities highlighted by our key informants merit follow-up and consideration by nutrition stakeholders in the DRC, inclusive of donors, government, UN agencies, and implementing partners.

- **Assess the national supply chain’s readiness to integrate RUTF.** RUTF has been included on the DRC’s Essential Medicines List, which is an important first step in the integration process. Learning from UNICEF’s four-province pilot of RUTF integration will be important to build from when determining what actions are necessary to make the integration of RUTF in national systems feasible. Warehousing infrastructure will be a key consideration as will accountability mechanisms to minimize leakages.

At present, government warehousing infrastructure at the province and health zone levels is inadequate in terms of the storage capacity required to hold the amount of RUTF needed to treat the number of wasted children. As highlighted in a series of UNICEF case studies on integrating nutrition products in health system supply chains, the integration of RUTF in national supply chains often requires health systems strengthening before it can be realized—a key consideration before embarking on this task in a challenging context like the DRC (Sorensen, Codjia, Hoorelbeke, Vreeke, and Jille-Traas 2016).

- **Expand the role of the Nutrition Cluster in supply chain management.** The Nutrition Cluster has put in place some mechanisms to try to monitor and coordinate RUTF stock in the country, including its national-level analysis efforts and province-level technical working groups (TWGs). However, information is not shared systematically by all partners, thus limiting the usefulness and robustness of these efforts. Nutrition stakeholders should consider formalizing and strengthening the Nutrition Cluster’s role in the supply chain. One important action could be adding more formal, standardized RUTF reporting alongside other routine wasting reporting data that humanitarian partners already supply to the Nutrition Cluster on a routine basis. The Nutrition Cluster could also play an important advocacy role to highlight infrastructure challenges (e.g., roads and warehousing) that are beyond the ability of nutrition stakeholders to fix directly.
- **Review targeting criteria and supply estimation formulas.** Underestimation of needs, including the need for buffer stock, originating at the proposal, procurement, and contracting process, are contributing to RUTF supply shortages at the health facilities. Assumptions used in supply estimates, including outdated wasting prevalence data and incidence correction factors, as well as the reliability of annual monthly consumption given continuous disruption of services due to stockouts, need to be carefully examined to see whether and how they may be contributing to the underestimation of needs. Involvement of government officials in the targeting and RUTF planning processes could be a way to improve these figures and take a step toward more government ownership of the RUTF supply chain at the same time.
- **Strengthen donor coordination around financing for and provision of RUTF.** UNICEF is not receiving

adequate funding to fully address RUTF needs in the DRC. However, other donors, with BHA and the World Bank being two cited examples, are also financing the procurement of RUTF through their own projects. NGOs are also purchasing RUTF with their own organizational funding. Although some level of duplication in the supply chain can be useful to help backstop breakdowns in different parts of the system, it can also lead to unintentional gaps in coverage and a lack of flexibility in the use of stocks at the national level. Better coordination, and ideally, even some level of collaboration among donors, implementing partners, and the government, are needed to ensure that the system for the provision of RUTF is set up in a way that is transparent, responsive, and equitable.

- **Continue efforts to alleviate RUTF importation barriers.** Advocacy on the part of the Nutrition Cluster should be bolstered by support from donors to ask the government to either revise its systems or expedite exemptions for partners who are importing this lifesaving product.

CONCLUSION

RUTF shortages and stockouts are by no means problems exclusive to the DRC, and much work has been done at the global level to understand how best to address this challenge. This study identified common challenges across pipelines, such as poor road and warehousing infrastructure, which hinder the timely, reliable, and adequate deliveries of RUTF to health facilities. However, because these challenges mean that delivery frequency, transportation modes, and delivery amounts are inconsistent, the cost of RUTF transportation could not be compared among the pipelines. All pipelines had performance challenges, with more than two-thirds of the facilities having records showing a stockout in the past six months and nearly all facilities having less than one month’s supply on hand at the time of our visit. Given the variability in contexts, even within an individual province, it is difficult to say for certain whether the structures of the pipelines or the contexts in which the pipelines are operating had more of an impact on overall performance. Ongoing investigation into the identified issues is needed to inform the implementation of the recommendations for strengthening RUTF delivery in the DRC. We hope that by detailing some of the on-the-ground examples in the DRC, this report can contribute to both global thinking and in-country action on practical solutions and best practices.



A child with severe wasting is assessed using a mid-upper arm circumference (MUAC) tape at a Unité Nutritionnelle Thérapeutique Intensive (Intensive Nutritional Therapeutic Unit) facility in Sud Kivu.

PHOTO CREDIT: GWENN DOUBOURTHOUMIEU

INTRODUCTION AND BACKGROUND

INTRODUCTION AND BACKGROUND

Ready-to-use therapeutic food (RUTF), a high-calorie and nutrient-rich prepackaged paste, is considered by many to have revolutionized the treatment of severe wasting in children under five. Since its development in the 1990s, humanitarian actors have been able to save the lives of many more children through outpatient treatment programs that are part of the community-based management of acute malnutrition (CMAM) approach. However, despite improvements in treatment brought on by these innovations, only one in three children who need wasting treatment receive it (UNICEF 2022). The cost of RUTF and the logistics required to deliver it are some of the factors that contribute to this low coverage.

Funding for the procurement and delivery of RUTF is highly reliant on humanitarian donors. An analysis of RUTF financing estimated that in 2021, available RUTF financing covered only about 25 percent of global needs (R4D 2021). However, due to

the compounding effects of the COVID-19 pandemic, climate change, and the crisis in Ukraine, both the cost of RUTF and the demand for it are projected to increase. The United Nations Children's Fund (UNICEF), which procures 75–80 percent of the global RUTF supply, estimated that the cost of RUTF will increase by 16 percent before the end of 2022 (UNICEF 2022).

SEVERE WASTING TREATMENT IN DRC

The Democratic Republic of the Congo (DRC) is one of 10 countries that make up 60 percent of the global burden of wasting in children under five (UN 2021). At the end of 2022, 2.8 million children between the ages of 6 and 59 months were estimated to be in need of wasting treatment. Of this number, 887,334 children were estimated to be severely wasted, requiring treatment with RUTF or therapeutic milk (IPC 2022).



PHOTO CREDIT: GWENN DOUBOURTHOUMIEU

A mother feeds her child a nutritious porridge during a cooking demonstration in Kongo Central. When there is a shortage of RUTF, service providers teach women to prepare porridges to support their children's recovery until treatment products are available.

The burden of severe wasting is not spread evenly throughout the country. Some health zones have estimated prevalence that exceeds 7 percent. Integrated Phase Classification (IPC) estimates project that in the first half of 2023, the situation will deteriorate, with 84 of the analyzed health zones and territories reaching the critical phase of wasting levels (IPC 4), meaning that 10–14.9 percent of children ages 6–59 months in those zones will be classified as either moderately or severely wasted using mid-upper arm circumference (MUAC) (IPC 2022). As per the public health thresholds established by the World Health Organization (WHO) and UNICEF, these health zones are just on the edge of having very high wasting prevalence levels, which is of significant concern (see box 1).

Box 1: Public Health Prevalence Thresholds for Wasting

Very low:	<2.5%
Low:	2.5–<5%
Medium:	5–9%
High:	10–14%
Very High:	≥ 15%

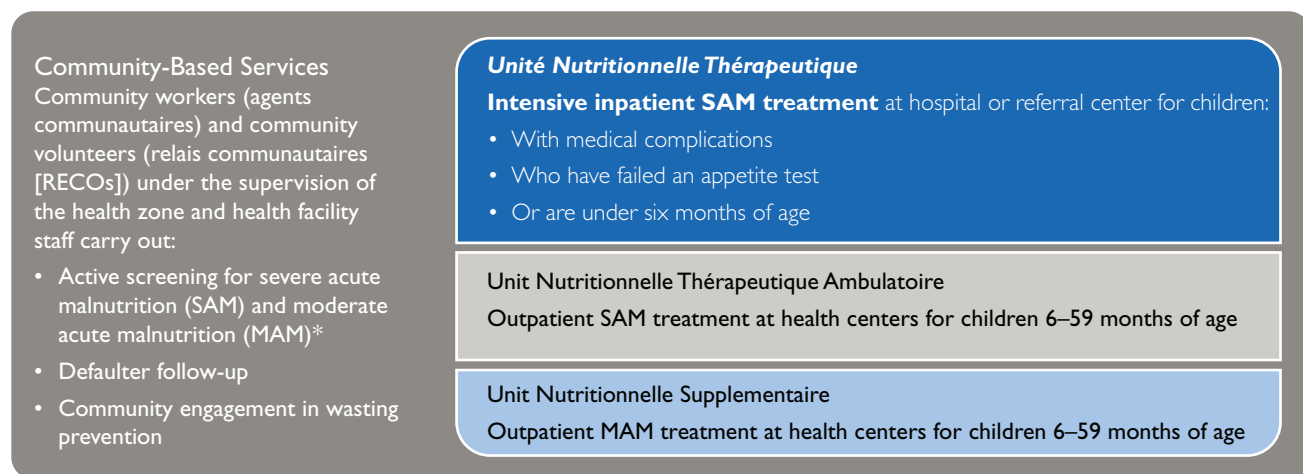
Source: WHO and UNICEF 2017

The DRC has adopted the CMAM approach to treat wasted children. In the DRC, CMAM is known as Integrated Management of Acute Malnutrition (IMAM) and includes all standard components of care, as illustrated in figure 1. According to the Protocole National de Prise en charge de la Malnutrition Aiguë (National Protocol on the Management of Acute Malnutrition), wasting treatment services are to be integrated in the health system at the health area (facility) level.

RUTF and therapeutic milks are used for the treatment of severe wasting in children under five. This includes outpatient treatment for severe wasting, which in the DRC is called Unité Nutritionnelle Thérapeutique Ambulatoire ([UNTA]; Ambulatory Therapeutic Nutritional Unit) and, to

a lesser extent, inpatient treatment for severe wasting with complications at the Unité Nutritionnelle Thérapeutique Intensive ([UNTI]; Intensive Nutritional Therapeutic Unit). RUTF and therapeutic milks are on the DRC’s National Essential Medicines List, and RUTF is included among the products to be tracked in the Système d’Information en Gestion Logistique [SIGL] (Logistics Management Information System) (Ministère de la Santé 2020; MSH 2014; Ministère de la Santé Publique 2020). Although stock tracking systems are also integrated in the District Health Information System (DHIS-2) for some medical items (e.g., vitamin A, antibiotics), RUTF data may be collected on paper but are not systematically available in the digital system.

Figure 1. IMAM Services in the DRC



*SAM and MAM are used in the DRC IMAM Guidelines for the classification of children with a weight-for-height or -length z-score more than two standard deviations below the median of the WHO child growth standards or who have nutritional edema. Although we use the term “wasting” throughout this report, we also include children with nutritional edema when using this term while acknowledging that their precise definitions are different.

STUDY RATIONALE

Actors engaged in wasting programming in the DRC often cite the exceptionally challenging logistical context as a major impediment to IMAM program effectiveness. A 2018 assessment of the DRC's supply chain conducted by the Global Fund to Fight AIDS, Tuberculosis and Malaria found that the system, generally, is fragmented and suffering from a lack of leadership, ownership, and coordination across partners and programs. The system is made up of multiple parallel supply chains, and procurement is often based on outdated caseload data or targets that capture only a portion of actual needs. This situation is further complicated by poor basic infrastructure and logistics systems, including warehousing and data management (GHSC-TA 2019). These challenges are made increasingly complex by ongoing insecurity in parts of the country.

USAID Advancing Nutrition has been supporting the Bureau for Humanitarian Assistance (BHA) of the U.S. Agency for International Development (USAID) and the USAID Mission in the DRC since 2019 to understand the challenges facing nutrition stakeholders responsible for delivering wasting treatment and prevention services. As part of its ongoing support to document wasting services in the DRC, USAID Advancing Nutrition previously identified ongoing challenges with the RUTF logistics system in some of USAID's areas of operation in Kasai Oriental and Sud Kivu provinces. Some of the main challenges and potential bottlenecks in the logistics system we identified from that earlier work included the following:

- **Highly variable availability of RUTF at health facilities, possibly driven by the way RUTF delivery is supported.** Based on a small set of data collected in Kasai Oriental, we found that UNTAs that were supported by a nongovernmental organization (NGO) partner that was responsible for the procurement, import, and delivery of RUTF had a more reliable supply of RUTF than those supported by UNICEF partners. During our data collection period, UNICEF partners reported that their UNTAs had no RUTF stocks for three months (January–March 2021) (USAID Advancing Nutrition 2022). This illustrates two different ways that implementing partners support the delivery of RUTF to health facilities, and more varied data are needed to understand the extent to which these different mechanisms may impact RUTF availability.
- **Variable contract periods with partners responsible for the last mile delivery of RUTF, depending on the donor (e.g., UNICEF or BHA).** UNICEF's initial contractual agreements with local partners are typically for six months, although short extensions are sometimes granted. There are often gaps in the renewal of these contracts, which can lead to stockouts—or even wastage—of RUTF because there is no one available to support its delivery to the UNTAs and UNTIs. USAID awards to NGO partners are frequently for one year. Contract duration and gaps in contract renewals are likely contributing to RUTF stockouts and the variability across the health zones.
- **Different partner processes for planning RUTF needs, with local officials largely excluded.** UNICEF partners cited a lack of resources to transport RUTF, despite being financed by UNICEF to complete this task. More information is needed about UNICEF's budgeting requirements and how partners apply that guidance to their proposals. In addition, although the Nutrition Cluster prioritizes health zones for support, the process of prioritization is not always clear. In some instances, health zones categorized in Nutrition Cluster prioritization exercises as having catastrophic levels of malnutrition (severe wasting >10 percent, moderate wasting ≥15 percent) did not receive a full package of wasting treatment support. Furthermore, UNICEF does not plan its RUTF procurements to cover 100 percent of the population in need, and local officials have expressed dissatisfaction at not being included in the targeting process.
- **Existence of several systems for tracking RUTF supplies but a lack of clarity about whether they are integrated or how the data are used for RUTF supply planning and management.** Initially, nutrition products were not included in the DRC's national logistics management system (SIGL), but RUTF was added in 2020. RUTF is also supposed to be tracked in the DHIS-2. However, we did not hear any mention from government or partners about how this information was used to plan for and monitor RUTF procurement and delivery. More information on RUTF data gathering and use is needed to understand how this may be influencing stockouts (USAID Advancing Nutrition 2022).

Given these previously identified challenges and marked differences in RUTF supply availability across health zones, it was determined that more information was needed to understand what was driving these performance differences, and the potential cost and program outcome implications that may be related to variability in pipeline structure and delivery mechanisms. Moreover, because there is such a breadth of both contextual considerations (e.g., seasonal access, security, size of health zones) and the types of delivery mechanisms and contractual arrangements used for last mile delivery, we felt that it was important to understand what factors might be driving cost differences in RUTF delivery (e.g., types of transportation used, frequency of deliveries, supply chain level to which transportation is assured).

DRC RUTF SUPPLY CHAIN PIPELINES

Despite the policy-level integration of wasting treatment and RUTF in national systems and services, the supply chain for RUTF is often parallel to other logistics and supply systems. At the national level, the majority of RUTF is procured and imported by UNICEF. In addition, NGO partners procure and import RUTF to support their program areas.

In most cases, UNICEF or the NGO implementing partner is responsible for warehousing, transporting, and managing RUTF. However, the processes by which RUTF moves from the national level to the health areas where IMAM service points are located vary greatly at all levels of the system. Factors that influence the RUTF pipelines include who imports the RUTF, who transports the RUTF, and how these organizations or subnational government entities are funded.

DEFINITION OF SUPPLY CHAIN PIPELINE

A supply chain “pipeline” refers to “the entire chain of physical storage facilities and transportation links through which supplies move from the manufacturer to the user, including port facilities, central warehouse, regional warehouses, district warehouses, all service delivery points, and transport vehicles (John Snow, Inc. 2020).

Through our previous work, we identified four RUTF pipelines that may receive either direct or indirect⁵ support for procurement and transportation of supplies from USAID. For three of the pipelines, UNICEF is responsible for the procurement, import, and distribution of RUTF from central warehouses to the provinces. The last mile delivery of the RUTF is then conducted in one of three ways:

1. **Implementing partner with a Programme Cooperation Agreement (PCA):** A UNICEF-

contracted implementing partner, typically but not always a local organization, is funded to conduct the last mile delivery of the RUTF from the province level to the severe wasting treatment sites in the health areas. These UNICEF-financed contractual agreements are known as PCAs.

2. **Implementing partner with a PCA In-Kind:** For a PCA In-Kind (supply PCA), an implementing partner, typically an international NGO with an existing health or nutrition project, completes the last mile delivery to the health areas. There is no financial agreement between the project and UNICEF as part of this arrangement. RUTF products are provided to the implementing partner by UNICEF in-kind.

3. **Government actor with a Program Document (PRODOC):** UNICEF signs a PRODOC agreement

with a government entity. For nutrition, the agreement is signed with the Direction Provinciale de la Santé (DPS; Provincial Department of Health) and is implemented by the provincial-level Programme National de Nutrition (PRONANUT; National Nutrition Program) staff. PRONANUT distributes RUTF to the health areas, usually in coordination with health zone-level officials.

The final pipeline is financed directly by BHA, working through an international NGO partner.

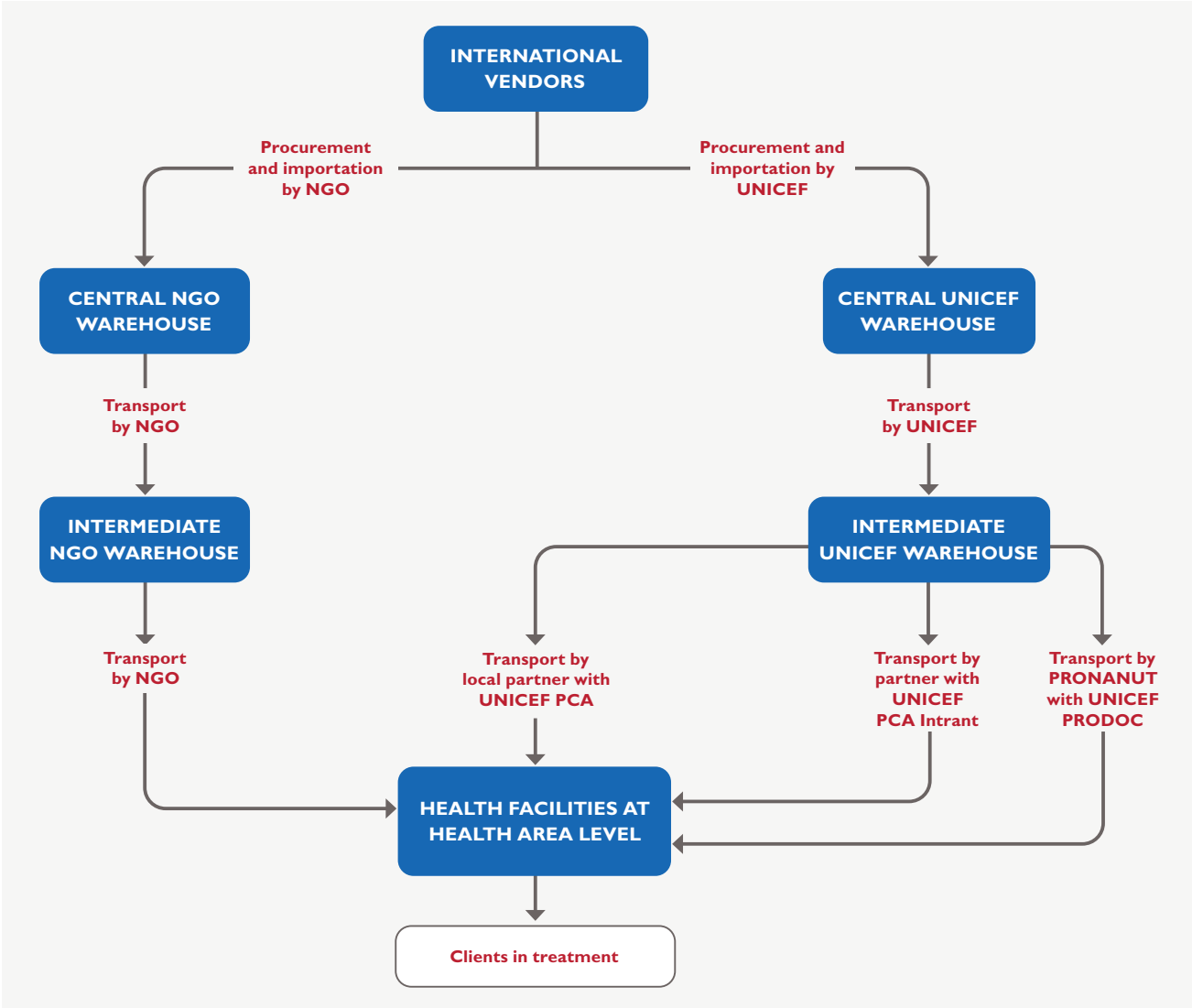
4. **NGO direct purchase and transportation of RUTF:**

This pipeline is managed primarily by the NGO. The NGO has a contract with BHA to purchase, import, and distribute RUTF to supported health facilities in its targeted health zones and health areas.

Figure 2 outlines our understanding of the basic structure of these four pipelines based on an initial mapping that we completed during the study design process.

5. USAID provides funding to UNICEF to support wasting prevention and treatment services. For the purposes of this study, USAID Advancing Nutrition assumes that pipelines that are under UNICEF's responsibility receive some level of "indirect" support from USAID.

Figure 2. Structure of Pipelines for USAID-Supported Last Mile Delivery of RUTF





Health workers assess a child's length at a health facility in Banalia, DRC. Assessing weight-for-length is one way to check younger children for wasting.

PHOTO CREDIT: GWENN DOUBOURTHOMIEU

METHODOLOGY

METHODOLOGY

CONCEPTUAL FRAMEWORK

A basic requirement for health systems to perform their intended functions is to be adequately supplied with the products that they intend to deliver to clients. Without them, the health system cannot function effectively—“no product, no program.” A logistics system is the interconnected system of policies, actors, physical goods and warehouses, financing, and data that work together to ensure that products get where they are needed. More specifically, the goal of a logistics system is to guarantee the “six rights.”

That is, the logistics system should provide the right goods, or the products that are needed or wanted by clients. It should provide them in the right quantities so that service delivery points do not run out, but also so that products do not expire on shelves, or take up more of limited shelf space than needed. It should provide them in the right condition, meaning that they are not expired or damaged, but rather are usable. It should provide them to the right place, meaning the place where clients can access them, whether that be a health center or community outreach services. It should provide them at the right time, meaning that they are available when needed. All the above should be done at the right cost—that is, it should be done efficiently to make the best use of finite financial resources (John Snow, Inc. 2020).

THE LOGISTICS CYCLE

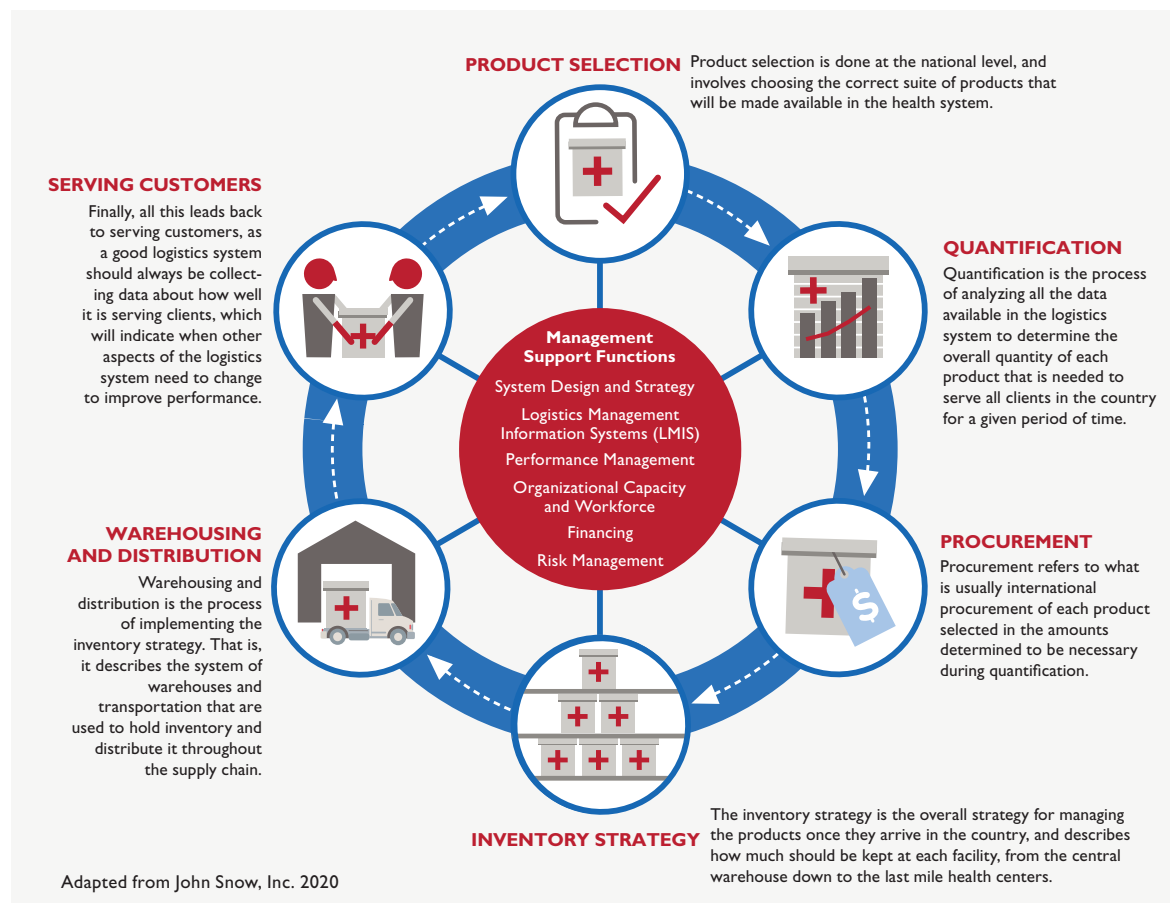
The logistics cycle, pictured in figure 3, describes the various components in a logistics system and how they interrelate. “Serving customers” appears at the top because that is the end goal of any logistics system. In the middle are various management support functions that support the entire process.

It is important to note that a breakdown in any part of the logistics cycle, including management support functions, can result in a stockout at the last mile. However, some parts of the logistics system are typically more visible to actors at the central level than others. Product selection, quantification, procurement, and the determination of the inventory policy that will be used are all typically done at the central level, and are therefore often more visible to national-level actors and partners. It is often in the implementation of warehousing and distribution and the actual serving of clients where visibility is lacking. This study therefore focuses on these last two components of the logistics cycle, to look at how well clients are being served, and to examine to what extent any problems in serving clients can be attributed to the structure of the warehousing and distribution system.

THE SIX RIGHTS OF LOGISTICS

1. The RIGHT goods
2. In the RIGHT quantities
3. In the RIGHT condition
4. To the RIGHT place
5. At the RIGHT time
6. For the RIGHT cost

Figure 3. The Logistics Cycle



RESEARCH QUESTIONS

This study sought to examine the degree to which the four different USAID-supported supply chain pipelines for RUTF in the DRC can deliver RUTF to the UNTAs and UNTIs as per the “six rights” of a well-functioning logistics system, and document what factors may be contributing to differences in pipeline performance. Our specific research questions were the following:

1. What are the different supply chain pipelines in use in the selected provinces; how are they structured and how do they differ?
2. What are the costs associated with each pipeline and what drives differences in key costs?
3. How does supply chain performance, as measured by stock availability at the last mile, differ across the pipelines?

4. What are key challenges to product availability identified by key informants working in each pipeline, and how do they differ across pipelines?

STUDY DESIGN

This was a mixed-methods study. We conducted key informant interviews with health facility staff, government, implementing partners, and UN entities at all levels of the supply chain to learn about the structure of the pipelines, stock management procedures, transportation and logistics, procurement planning and contract procedures, key cost drivers, and perceived challenges and opportunities. We also conducted in-person warehouse visits and stock record reviews, using a quantitative tool based on the Logistics Indicator Assessment Tool to learn about stock availability, record keeping practices, stock management practices, and stock ordering, reception, and distribution practices (USAID | DELIVER PROJECT, Task

Order I 2008). Data were collected between August and December 2022. Data collection in Kasai Oriental took place in August 2022, and at the national level and in Nord Kivu from November to December 2022. Data gathered through the key informant interviews and quantitative tools were largely complementary and, in some cases, were used for triangulation of information if there were inconsistencies in what was verbally described and what was found in record reviews.

The study included only an examination of the USAID-supported delivery pipelines for RUTF used in the treatment of severe wasting.⁶

Study Population and Sampling Plan

All sampling for this study was purposive. In total, we visited 27 health areas and conducted 73 key informant interviews. We also visited 43 RUTF storage facilities (e.g., regional/province/health zone-level warehouses and health facility depots) to review stock records and/or complete the quantitative data collection. Detailed sampling criteria for the site and key informant selection are described in the following sections.

Province Selection

We selected two provinces in consultation with BHA that were representative of the different operating contexts in the DRC and based on the presence of the different supply pipelines at the time of the study design. Kasai Oriental was selected as a more stable operating environment and Nord Kivu as a complex emergency environment. These two provinces are also served by two different national-level UNICEF RUTF importation pipelines, with imported products entering the country through different ports.

Health Zone Selection

We selected three health zones in each province for more detailed analysis, based on the following criteria:

- Context, aiming for a mix of urban and rural settings
- Distance from main town/central warehouse

- Presence of at least one of the targeted supply chain pipelines
- Accessibility (both in terms of infrastructure and security)
- Level of prioritization by the Nutrition Cluster.

The selection of health zones was also influenced by the types of pipelines in each health zone to ensure that all four pipelines were well represented in the sample. The partners supporting RUTF delivery in the selected health zones were then automatically included in our key informant interview sample (see the “Key Informant Selection” section).

Health Area Selection

We then selected five health areas in the selected health zones in consultation with the health zones’ chief medical officers (*médecins-chefs de zone de santé*), using the following criteria:

- Automatic inclusion of the health area if a UNTI is present (typically there is only one UNTI per health zone)
 - In health areas with a UNTI, if a UNTA is also present at the same site, it was automatically included in our site selection.
- Presence of at least one of the supply chain pipelines
 - Health areas were excluded if there was no USAID-supported RUTF pipeline present.
- Mix of high- and low-density catchment area populations (e.g., urban and rural settings).
- Mix of distances from and accessibility by the health zone central office (*bureau central de la zone de santé [BCZ]*).

A summary of the selected sites per province is detailed in table 1. As per the sampling criteria described previously, our target number of health areas was five per health zone, for a total of 27 health areas and 30 service delivery points across the two provinces. We were just short of this target number in Nord Kivu because there were not enough UNTIs/UNTAs currently providing CMAM services with support from the identified partners in the selected health areas at the time of data collection. Additional details about the selected sites can be found in annex 1.

6. Although several pilots are underway, or were recently completed, examining the use of RUTF for treatment of moderate wasting, they are not included in the scope of this study. The three simplified methods piloted in the DRC include Combined Protocol for Acute Malnutrition Study (ComPAS), Modelling an Alternative Nutrition Protocol Generalizable for Outpatient (MANGO), and Optimizing Treatment for Acute Malnutrition (OptiMA). In addition, for selected UNTIs, we did not examine the pipeline for therapeutic milks (formula-75 and formula-100) in detail (e.g., we did not take stock counts for these supplies).

Table 1. Summary of Selected Sites by Province

Province	Selected Health Zones, Partners, and Pipeline Type	Number of Health Areas	Number of Service Delivery Points
Kasaï Oriental	Cilundu Save the Children NGO procurement	5	1 UNT14 UNTAs
	Dibindi Social Development Center (SDC)PCA	5	1 UNT15 UNTAs
	Kasansa Save the ChildrenNGO procurement	5	1 UNT15 UNTAs
Nord Kivu	Kibua Première Urgence Internationale (PUI)NGO procurement	4	1 UNT13 UNTAs
	Goma No specific partner support*	3	1 UNT13 UNTAs
	Walikale PRONANUTPRODOC	5	1 UNT14 UNTAs
Total	6	27	6 UNT1s 24 UNTAs 30 total service delivery points

*Goma was originally sampled as a PCA In-plant site, with support from Heal Africa. However, this agreement was no longer in place at the time of data collection.

Warehouse and Depot Selection

Based on the information collected about the transportation and storage of RUTF in the selected health zones and health areas, the data collection team visited the relevant warehouses and depots that are managed by an implementing partner, UNICEF, or the government/health facility. Note that in

some cases we found that the warehouses, usually at the BCZ level, did not stock RUTF and, therefore, we did not use the quantitative tools at those sites. Table 2 summarizes the warehouses and depots visited.

Table 2. Summary of Visited Warehouses and Depots

Level	Government		United Nations		NGO		Total	
	Kasaï Oriental	Nord Kivu	Kasaï Oriental	Nord Kivu	Kasaï Oriental	Nord Kivu	Kasaï Oriental	Nord Kivu
Province	0	0	1*	1	2	3	3	4
Health zone	3	3	n/a	n/a	n/a	1	3	4
Health area	17	12	n/a	n/a	n/a	n/a	17	12
Sub-national subtotal	20	15	1	1	2	4	23	20
Total	35		2		6		43	

*The UNICEF warehouse for the Kasaï region is located in Kananga, Kasaï Central, and covers Kasaï Oriental.

Key Informant Selection

Semi-structured interviews were held with key informants from health facilities, government, implementing partner organizations, and UN entities at all levels of the supply chain. The types of key informants included nutrition focal persons; contract and warehouse managers; government officials involved in wasting treatment program delivery; facility-based staff in charge of wasting treatment services; and medical stores managers for UNTI and UNTA sites.

The semi-structured interviews were used to gather data on the structure of the various RUTF pipelines, and to identify

bottlenecks and challenges along the pipelines as well as possible solutions to these challenges from the perspectives of the various supply chain actors.

Table 3 summarizes the number of interviews completed at each level of the supply chain and by respondent type. The difference in the number of interviews at the provincial level is driven by the number of pipelines and supporting implementing partners present in the selected geographic areas.

Table 3. Summary of Key Informant Interviews

Level	Government		United Nations		NGO		Total	
	Kasaï Oriental	Nord Kivu	Kasaï Oriental	Nord Kivu	Kasaï Oriental	Nord Kivu	Kasaï Oriental	Nord Kivu
Global	N/A		0		1		1	
National	1		3		3		7	
Sub-national	Kasaï Oriental	Nord Kivu	Kasaï Oriental	Nord Kivu	Kasaï Oriental	Nord Kivu	Kasaï Oriental	Nord Kivu
Province	2	2	4	3	3	4	9	9
Health zone	7	4	n/a	n/a	3	0	10	4
Health area	20	13	n/a	n/a	0	0	20	13
Sub-national subtotal	29	19	4	3	6	4	39	26
Total by informant category (all levels)	49		10		14		73	

Analysis

Key informant interviews were audio recorded, upon receiving consent from the interviewees. All interviews were transcribed and translated from French to English using an external transcription service. The transcriptions and translations were reviewed for accuracy by the USAID Advancing Nutrition team. The qualitative data from the interviews were analyzed using Atlas.ti. Two rounds of test coding were performed to finalize the codebook and ensure inter-coder agreement between the two coders.

The quantitative data collection tool was administered using the JotForm electronic survey platform, accessed by a team of data collectors on their mobile phones while visiting sites, with a paper copy of the survey tool available as a backup. Survey data were uploaded from the data collectors' phones to the JotForm cloud database, either immediately if cellular service was available at the data collection site, or shortly thereafter once the data collectors returned to an area with cellular service or WiFi. Data were reviewed by the data collection supervisor at the end of each day to ensure fidelity. The complete dataset was then downloaded into Excel for cleaning and analysis by the lead quantitative data analyst, with communication with the data collection supervisor for any needed clarifications.

Ethical Considerations

Ethical review and approval for this work was provided by the JSI Research & Training Institute, Inc (JSI) Institutional Review Board. Verbal consent was obtained from all key informants. No incentives were provided for participation in the study.

Limitations

Selection of health zones was purposive to include the four identified types of RUTF pipelines. However, due to changes in funding and contract agreements, we were unable to identify a PCA Intransit agreement in our selected provinces at the time of data collection. Therefore, the information about this type of pipeline is limited, and it has not been included in some aspects of our analysis.

The sample of health facilities included in the analysis is not a statistical sample, which would have required a much larger study population. As such, key quantitative results are representative of the differences among the individual facilities sampled. Although the results may be indicative of differences across the larger pipelines, the sample size does not allow us to make comparisons with any level of statistical precision.

Moreover, the limited geographic scope of the study meant that, in several cases, the facilities representing a pipeline came from only one health zone. Because of this, differences in quantitative indicators among pipelines may be due to the pipeline structure, or may be due simply to differences between the zones included, unrelated to the pipeline that serves those zones.

We did not do a detailed costing of all elements of the supply chain because such a study requires extensive data collection at all levels of the supply chain and across the complete geographic scope of the supply chains, as well as expensive supply chain modeling software, and was beyond the scope of what is needed to answer the key questions that this study sought to answer.

Last, our findings are illustrative of the challenges and opportunities in the DRC related to the RUTF supply chain and focus only on pipelines funded by BHA. They are not representative of all RUTF supply chains in the country.



A storekeeper checks RUTF supplies at the Kabeya Kamwanga General Hospital's medical store in Kasai Oriental.

PHOTO CREDIT: GWENN DOUBOURTHOUMIEU

FINDINGS



PHOTO CREDIT: GWENN DOUBOURTHOMIEU

A young girl is screened for wasting using a MUAC tape at a facility in Kongo Central.

FINDINGS

Our findings are presented in four sections. First, we provide a description of each RUTF pipeline examined based on explanations of key processes provided by key informants at all levels of the health system. We then present an analysis of pipeline performance based on qualitative and quantitative information on supply availability and stockouts. Next, we discuss cost drivers for the various pipelines and issues affecting the ability to cost each pipeline. Last, we present the underlying challenges identified by key informants that may be contributing to RUTF stockouts and opportunities for strengthening the RUTF supply chain in the DRC.

DESCRIPTION OF RUTF PIPELINES

The following sections describe how RUTF makes its way to the DRC and to the UNTA and UNTI wasting treatment service delivery points. These narratives are based on information shared by key informants at the national, province, health zone, and health area levels. We provide

both a description of key processes as reported by the UN, government, or implementing partner agency, and the perspectives from the health zone and health area staff to provide a comprehensive picture of how each pipeline is functioning.

As part of the health area-level interviews, we asked health facility staff to describe their RUTF supply management processes. Table 4 summarizes their responses according to common themes that came out of the interviews. Key informants at facilities in Kasai Oriental gave more detailed descriptions of their RUTF stock management procedures than did informants from the health areas in Nord Kivu. Although this information does not necessarily mean that each step is or is not systematically completed, it does provide insight on what health facility staff interpret as important steps in the RUTF supply management process because they specifically mentioned that these steps are part of their procedures.

Table 4. Summary of Facility-Level Stock Management Procedures by Health Zone, Mentioned by Key Informants

	Kasaï Oriental			Nord Kivu			Total Service Delivery Sites
	CilunduSave the Children–NGO Procurement	DibindiSocial Development Center–PCA	KasansaSave the Children–NGO Procurement	Goma No Defined Partner/ Pipeline	Kibua PUI–NGO Procurement	Walikale PRONANUT–PRODOC	
Count stock on arrival	2/5	3/6	4/6	0/4	0/4	0/5	30% (9/30)
Sign a delivery note and/or have a receipt slip	5/5	5/6	6/6	2/4	2/4	1/5	70% (21/30)
Update stock sheets on arrival	3/5	6/6	4/6	4/4	2/4	1/5	67% (20/30)
Require a supply requisition to take stock out of depot	3/5	6/6	5/6	1/4	2/4	1/5	60% (18/30)
Use client-based stock monitoring tools (e.g., cross-reference with client cards or keep a consumption book)	4/5	5/6	5/6	1/4	2/4	2/5	63% (19/30)
Facility staff involve community in receiving stock (e.g., unloading or signing delivery slip)	1/5	2/6	3/6	1/4	1/4	0/5	27% (8/30)
Complete weekly reports, inclusive of stock data	0/5	6/6	2/6	0/4	4/4	0/5	27% (8/30)
Complete monthly reports, inclusive of stock data	4/5*	6/6	5/6	4/4	4/4	3/5**	87% (26/30)
Average number of procedures mentioned by facility staff	4/7 (57%)	4.5/7(69%)	4.8/7 (69%)	2.25/7 (32%)	3/7 (43%)	1.2/7 (17%)	3.43/7 (49%)

* All facilities mentioned sending reports to the BCZ, but one did not specify the frequency.

** All visited facilities mentioned sending reports to the health zone, but only three of the five specifically mentioned that it was done monthly. However, it is likely that all five do actually report on a monthly basis.

UNICEF Procurement and Importation of RUTF

Before describing the three UNICEF-supported pipelines in more detail (PCA, PCA Intransit, and PRODOC), we present UNICEF's process for procuring and importing RUTF for use in the DRC. The imported products are provided by UNICEF to implementing partners or PRONANUT for onward distribution to the health zones and areas, as detailed under a PCA, PCA Intransit, or PRODOC agreement.

Quantification of Needs

UNICEF bases its RUTF needs on the annual DRC Humanitarian Response Plan (HRP). Needs are calculated according to the HRP targets and nationally aggregated RUTF consumption averages. In the DRC, the consumption average is approximately 0.8 cartons of RUTF to treat one child. Entities outside UNICEF are not directly involved in the RUTF quantification and planning processes. However, the nutrition-related content of the HRP is compiled by the Nutrition Cluster, which includes the involvement of the government, implementing partners, and UN agencies. In speaking with government officials from PRONANUT and DPS, we found that none felt that they were involved in UNICEF's RUTF procurement planning processes. Government officials consistently expressed a need and desire to be more engaged, mostly to help ensure more accurate planning and thereby reduce supply chain breaks.

Procurement

There is currently no local production of RUTF in the DRC. All UNICEF RUTF procurements are from international sources, coming from a wide range of suppliers based in different countries. Among the sources mentioned by the UN-affiliated key informants were France, Haiti, India, Kenya, South Africa, and the United States. Although there are DRC-based importers and distributors of RUTF that are used by some implementing partners, it does not seem that UNICEF has any agreements with these entities for RUTF procurement. The procurement process is managed by UNICEF's Supply Division in Copenhagen in consultation with the DRC-based UNICEF team.

There is no fixed schedule for the restocking of RUTF in the DRC; rather, orders are placed based on programmatic needs. A national-level system for monitoring imports was described. Monitoring is done monthly and is said to inform further half-yearly monitoring of imports. A UN-affiliated key informant said that, over the past two- to three-year period,



PHOTO CREDIT: GWENN DOUBOURTHOMIEU

USAID provides a large portion of the RUTF used to treat severely wasted children in DRC, including RUTF distributed by UNICEF.

RUTF coming directly from BHA in-kind has tended to arrive in two shipments.

Importation and Initial Stock Management Procedures

Unlike most other international nutrition actors in the DRC, UNICEF is exempt from paying importation taxes and fees. It was also mentioned by a UN-affiliated key informant that UNICEF has “all the necessary accreditations to facilitate the procedures for importing inputs into the DRC,” and, therefore, does not experience delays with customs procedures. This is a very different experience from that described by NGOs that are importing RUTF into the DRC and have had challenges obtaining the necessary exemptions from the government. (See the later section on “NGO Direct Procurement and Importation of RUTF” for more details.)

Once the stock clears customs, it is transported to one of four UNICEF regional warehouses (see figure 4). From these regional warehouses, UNICEF transports the RUTF to the provinces, where it is handed over to the implementing partners or government for distribution to the health zones and areas.

Figure 4. Mapping of UNICEF Warehouses and Ports of Entry



ROLE OF THE NUTRITION CLUSTER IN THE RUTF SUPPLY CHAIN

We spoke with key informants at the national level and from the regional/provincial level clusters that covered our selected provinces to understand how the Nutrition Cluster is involved in the RUTF supply chain in the DRC.

The Nutrition Cluster is not directly involved in UNICEF's procurement processes or the contracting of partners for the delivery of RUTF to the health zones and areas. Coordinators described their role as helping to follow up and track the inputs once they have entered the country.

At the national level, the Nutrition Cluster has a technical working group (TWG) for CMAM activities. In this TWG, analyses comparing the amount of RUTF received and the number of treated cases are presented and information is shared about the partners currently providing RUTF inputs. The national-level Nutrition Cluster also tries to track the amount of RUTF received by different partners to stay informed of the quantities on hand in case there is an unmet need in other health zones. However, the Nutrition Cluster does not receive systematic updates from partners on actual amounts of RUTF received; therefore, the Cluster is limited in the support that can be provided to this kind of tracking. At the regional/province levels, the Nutrition Cluster has TWGs specifically for inputs and to assist with the monitoring of inputs.

In terms of supporting the planning for RUTF needs, the Nutrition Cluster supports the development of the HRP, which includes an estimated number of children expected to require wasting treatment during the upcoming year. The Nutrition Cluster also supports the prioritization of health zones and setting targets for the nutrition interventions included in the HRP. Nutrition Cluster coordinators mentioned that they also try to work with UNICEF and its contracted partners to ensure that there is an exit strategy for the end of partner support, including ensuring that additional stock will be left with the facilities after the partner leaves the health zone.

However, the coordinators noted that actual caseloads often exceed the targets, meaning that these additional stocks begin to be used before the end of the contract period, thus limiting the supplies that are left over for the transition period. It was also mentioned that the Nutrition Cluster shares tools with partners to aid them in calculating RUTF needs based on population estimates.

Coordinators also mentioned that partners often come to them when they have supply shortages, asking for Cluster support to find stock to fill gaps. One coordinator mentioned that this can even happen at the start of projects, when there have at times been three to four months of delays before initial stock arrives. In these instances, the Nutrition Cluster helps arrange “loans” of RUTF from other organizations. Coordinators mentioned that having adequate buffer or contingency stock in the country to help cover shortages could help alleviate this challenge. The Nutrition Cluster has also played an important advocacy role when partners have faced importation challenges. A scenario from 2021 was described where “many partners” had their RUTF imports blocked for three to four months at the border. The Nutrition Cluster stepped in to help calculate import fees and advocate to the Ministry of Health (MOH) for the release of the shipments. Several key informants mentioned that the problem with importation regulations is ongoing.

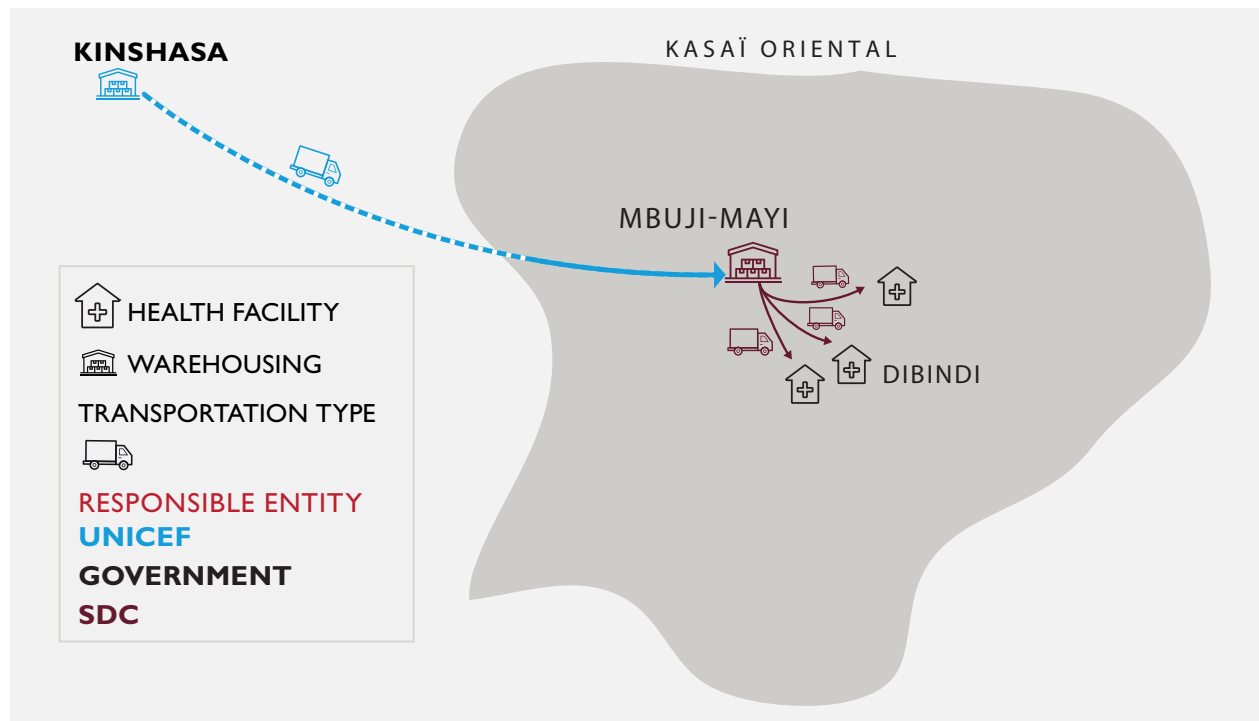
A range of key informants corroborated the information shared by the Nutrition Cluster, indicating that they look to the Nutrition Cluster for support when they face stockouts. Given the frequency of contact that the Nutrition Cluster has with partners and government officials and its key coordination, monitoring, and advocacy roles, its role in the supply chain appears to be rather informal and something that should perhaps be examined more closely.

Programme Cooperation Agreement (PCA)

Partner: Social Development Center
Location: Dibindi health zone, Kasai Oriental

- Key Findings:**
- RUTF pushed from UNICEF to SDC.
 - SDC transports RUTF directly from its zonal warehouse to the health areas.
 - RUTF requests are based on health facility average monthly consumption, but facilities often receive less than what was ordered.

Figure 5. Dibindi Health Zone RUTF Transportation



A PCA is a contract between UNICEF and an implementing partner, typically a local organization, which includes financing for an agreed set of activities. We were able to analyze one example where RUTF is delivered by an implementing partner, financed by UNICEF through a PCA. This example was in Dibindi health zone in Kasai Oriental, supported by the local implementing partner, SDC. Originally, we anticipated also including a PCA pipeline in Goma health zone in Nord Kivu but found that no agreements were currently in place.

Dibindi is an urban setting and makes up part of the main urban center of Kasai Oriental—Mbuji-Mayi. Mbuji-Mayi is also where the province-level warehouses for implementing partners

are located, meaning that the distance for supplies to travel between the partner’s warehouse and the health areas is much shorter than for some more rural areas. Recent prevalence data on wasting for Dibindi health zone is not available, but according to the final early warning data from 2022, the nutrition situation was deemed to be under control, with 19 percent of children assessed at the sentinel sites found to be moderately wasted. Of this number, 4 percent had nutritional edema, indicating the need for inpatient care (Ministère de la Santé Publique, Hygiène et Prévention [MSPHP] 2022). Figure 5 shows an overview of how RUTF is distributed in the health zone.

Contracting Procedure

SDC's most recent PCA with UNICEF was issued for an initial period of six months. The partner was granted a two-month extension, bringing the contract duration to a total of eight months. The extension was requested due to initial delays in the start of treatment activities and to allow for the full use of its allocated number of boxes of RUTF as per the PCA. Although RUTF was available at the start of the project, we were told that a one-month delay was caused by the requirement to put USAID stickers on the products before they could be distributed; however, the informant did not specify who labeled the product or why it was not labeled before it was delivered to the partner. Near the end of the initial six-month project period, only 15,000 of the 18,000 allocated boxes had been distributed, thus prompting the request for the two-month extension.

The contracting process was estimated by key informants to have taken approximately two months, starting with an expression of interest. Estimates of RUTF and transportation requirements were done in consultation with UNICEF, using information from the health zones and PRONANUT. Implementing partner informants said that there can sometimes be two to three months between contracts, but that sometimes there is an overlap, with a new contract signed before the current one has ended. The implementing partner mentioned past delays in the release of funds from UNICEF at the start of contracts. Previously, the initial release of funds by UNICEF could take up to two months, but it was noted that the situation has improved, with funds now received in less than one month following contract signing.

SDC's recent PCA included activities related to the treatment of severe wasting at both UNTI and UNTA levels. Infant and young child feeding (IYCF) activities are also included, such as screening, cooking demonstrations, and sensitization activities at community and health facility levels for pregnant and lactating women.

Initial Supply Request and Receipt of Stock from UNICEF

According to SDC, UNICEF supplies the organization with predetermined quantities of RUTF based on a schedule set out in the PCA. SDC does not place supply orders with UNICEF based, for example, on average consumption or facility-level reporting. However, SDC's logistics department does complete

an order form that is sent to UNICEF before receiving RUTF from UNICEF. UNICEF is in charge of delivering the RUTF from its central warehouse in Kinshasa to SDC's depot in Mbuji-Mayi in Kasai Oriental. SDC indicated that deliveries from UNICEF typically come by road and occasionally by air.

We were told that, overall, UNICEF respects the quantity of supplies to be delivered as outlined in the PCA but that sometimes products are not sent in a single delivery. The following example was given: The first delivery as per the PCA is 3,000 boxes. However, these 3,000 boxes may come in two deliveries of 2,000 boxes and 1,000 boxes, respectively. It was noted that this can lead to challenges with distribution because it may not be possible to supply all health areas if the full quantity is not received in a single delivery and on schedule.

Facility-Level Supply Estimation and Delivery Procedures

According to the process outlined by SDC, health zones develop distribution plans that they send to SDC. Next, SDC determines the amount of stock to deliver based on the quantities requested in the distribution plans and the availability of supplies in its Mbuji-Mayi depot. Distribution plans sent by the health zones are based on the amount of RUTF the health areas consumed during the past month, which is typically included in monthly CMAM reporting. This is a common way of estimating RUTF needs for distribution plans and is referred to as "average monthly consumption." A health zone informant in Dibindi said that they place their orders with SDC quarterly. SDC noted that it prefers that RUTF pass through the health zone as part of the delivery process, but that in some instances, it makes deliveries directly to the health areas. In the case of Dibindi, government informants stated that RUTF is no longer stored at the zonal level in Dibindi; rather, the supplies are delivered directly to the health areas. A health zone informant mentioned that this was a requirement of the partner, SDC. For their part, implementing partner informants mentioned that although SDC uses its own depot in Dibindi, it engages the health zone central office—the BCZ—when delivering the products to the health areas.

In Dibindi, health-zone level officials said that SDC notifies them when it is planning deliveries to the health areas, and that a representative from the zone accompanies them on the

delivery. According to health zone and health area officials, the ordering process matches what was described by SDC. Most of the facility-level key informants clearly stated that they make their order requests to the BCZ based on average monthly consumption. Except for the UNTI, where it was stated that little RUTF is used, all facility-level key informants said that they received less RUTF than the amount of RUTF requested. This finding was also reflected in the quantitative data that we collected. Four of five UNTAs in Dibindi were able to provide their most recent request and receipt vouchers; all available documentation showed that the amount received was below the amount requested.

All facility-level informants said that they had experienced stockouts despite their proximity to the SDC Mbuji-Mayi depot. This was borne out by the quantitative data: informants at all five health facilities visited in Dibindi reported remembering a stockout in the past six months; two of the five were actually stocked out on the day of the visit; and all five health facilities were able to provide stock records that showed a stockout in the previous six months. Key informants explained that when they receive the distribution plans from the health zones, they may revise them based on the amount of RUTF they have in stock. An example was given of a distribution plan for 1,000 boxes that may be revised downward to 500–600 boxes based on RUTF availability. This mismatch in facility-level requests and actual RUTF received has created the perception among facility-level staff that quantities are predetermined by the partner, with their specific requests not considered. A key informant at the health-zone level estimated that there had been at least four stockouts over the past six-month period.

I think they're using the underestimated data. Because when they come, for example, with the contracts, they already have their targets. For example, for our health zone of Dibindi, they come with the contract and they say: 'We will take only 2,600 children.' On the contrary, at the level of the health zone, we don't have 2,600; we may have, for example, 4,000, or even fewer than what they have. These are the problems we often encounter.

—Key informant from Dibindi health zone

Stock Management Procedures

Warehousing

As described earlier, SDC stores RUTF in its own depot in Dibindi health zone and then transports it to the health areas in collaboration with the BCZ. At the health zone level, government informants stated that they have a good warehouse location that is secure, with the necessary pallets for storage. Nevertheless, no concern was expressed about RUTF not being stored at the zonal level, with one informant even describing this practice as resulting in “one less task.” It was also noted that under the current system, nurses would not need to come to the central level to collect the products as they had in the past when the BCZ alone was responsible for distribution of RUTF.

In health areas with UNTAs, all key informants stated that they have their own depots, which are locked and have pallets for storing the RUTF. For the UNTI, nutrition inputs come into the main hospital depot and the UNTI staff request stock from this depot. Stock taken from the main hospital depot to the UNTI is noted on a stock sheet. None of the key informants we spoke to in Dibindi mentioned problems with out-of-date stock. However, several key informants mentioned problems with RUTF being delivered in bags rather than boxes, leading to rodent damage. An informant at one health facility mentioned that they sometimes receive unsealed boxes and sometimes find products to be missing after counting the RUTF sachets in the unsealed boxes.

Monitoring and Reporting

At the health facility level, key informants were able to describe robust stock monitoring systems from the point of the receipt of stock to its distribution to clients. Key informants at all service delivery sites mentioned completing both weekly and monthly reports that are sent to the BCZ. The health zone shares the reports with the partner, SDC, and PRONANUT. The health zone also integrates this information in the SIGL, but it was not clearly articulated how the information is used. The health zone informant also stated that stock information is entered in the DHIS-2; however, as noted earlier, RUTF data are not typically entered in the DHIS-2 digital platform. Last, health zone key informants mentioned that they conduct supervision visits, which include checking on inventory and stock management. Key informants from SDC indicated that they share their reports with PRONANUT and UNICEF.

EXAMINING THE RUTF PIPELINE IN GOMA HEALTH ZONE

Goma health zone was originally selected for inclusion in this exercise as an example of a PCA pipeline. However, when we conducted our interview with the supporting partner, Heal Africa, we learned that it did not currently have a PCA agreement with UNICEF. Despite not having an active agreement with UNICEF, key informants shared interesting insights on the difficulties of ensuring the availability of RUTF in the absence of a formal agreement with UNICEF or an implementing partner. Implementing partner informants explained that Heal Africa had PCAs in the past and more recently PCA Intrans agreements, but at present it was not receiving RUTF from UNICEF. Because health facility-level informants said that supplies were coming from the government, we then looked into whether Goma health zone could be categorized as being served under a PRODOC, with support from PRONANUT. However, in our interviews with PRONANUT and health zone-level staff, no specific plan for the provision of RUTF in Goma was outlined. Unlike Walikale health zone, which has specific provisions in the PRODOC for the transportation of RUTF, details about support for Goma were not mentioned. Heal Africa, which previously received supplies from UNICEF to support Goma health zone via a PCA Intrans (see the PCA Intrans section), indicated that it had to make the case to receive this support in Goma because malnutrition levels are relatively low, yet it was seeing high demand for wasting treatment services at its sites. According to early warning data, at the end of 2022, wasting among children assessed at sentinel sites was at 2 percent, with 1 percent of children having nutritional edema (MSPHP 2022).

Facility-Level Supply Estimation and Delivery Procedures

Health zone informants explained that different partners inform them when RUTF is available so that they can place orders for their facilities. It was explained that there is no “timetable of availability” for RUTF and that when supplies are received, the health zone refers to the information in SIGL to determine which health areas have the greatest needs before drawing up a distribution plan. According to health zone key informants, it does seem that PRONANUT plays a facilitation role in alerting the health zone when stock is available. However, PRONANUT does not seem to have specific quantities of RUTF or a transportation budget set aside for the Goma health zone. Provision of RUTF to the zone and the areas seems to be on an ad hoc basis and very irregular.

We issue a requisition to the zone and the zone in turn reacts within a week, if at least the inputs are available. If they are not available, we can easily be called on the phone, and [they] say: ‘The inputs you requested are not available in the zone, but we are also waiting for our partners to supply you.’ It’s like [this] without the normal [supply] system. If I find that I do not have the products and that Heal Africa has been able to get them, I also contact Heal Africa by phone or I can even go to Heal Africa. ‘Do you not have this or that product?’ If they have it, they give it to me. If they don’t have any, they will give their explanations [...] It’s a bit of a hassle, because additional inputs are not always available.

—Key informant from a facility in Goma health zone

Facility-level key informants all said that they received their RUTF from the BCZ. In some instances, RUTF is delivered by the BCZ to the facility, and other times the facilities must go and collect it themselves. Despite being located relatively near to the BCZ and in an urban center, facilities reported that transportation to collect the RUTF was a challenge. A health zone informant explained that when the health zone does not have support from a partner, they often have issues with providing transportation because they have to use their own vehicle, which was donated to them by another partner, and pay for fuel. Key informants explained that when they submit orders to the BCZ, the supplies received are not sufficient and do not match what was requested. Informants at all facilities said that they had experienced stockouts, and one reported receiving expired stock. Facility key informants all said that they place their orders based on average monthly consumption. However, some expressed concerns with this figure due to the irregularity of RUTF, impacting their admissions; therefore, they used consumption numbers for calculating orders.

To determine the quantity, the process is simple. It is the AMC [annual monthly consumption] we use, the average and monthly consumption. Unfortunately, using the AMC [is problematic] when there is an untimely break [in supply]. We had the inputs today, two weeks later it ends, the patients disappear. We don't know how to control even the patients we receive. They are there because the inputs are there. When there are no inputs, the majority disappear. As you have been told, we have 15 patients, but we have more than 100 patients per month. Unfortunately, we are at 15 because there are no inputs. That's the

problem [...] Imagine you gave me a product that ended in a week [...] There, the calculations will be a problem.

—Key informant from a facility Goma health zone

Stock Management Procedures Warehousing

Goma health zone has its own depot, where it stores RUTF when PRONANUT alerts the team about its availability. The RUTF is collected from PRONANUT by the health zone and transported to its depot. Facility-level informants all stated that they had a place to store RUTF; one even had a dedicated depot for the nutrition center. One facility stated that it keeps the RUTF in its office because “they don’t offer a place to put it.” Security measures at these storage facilities were not described in great detail. Informants at two of the four facilities said that the depot and/or office is locked, two mentioned regular (daily or every 48 hours) warehouse checks, and one only mentioned using stock cards for managing the warehouse supplies. None mentioned quality control measures, such as the use of pallets or rodent control measures.

Monitoring and Reporting

Health zone informants said that they keep stock cards as records of RUTF that is received and distributed. They draw up health zone distribution plans, and delivery notes are signed by both the health zone and the health area when the supplies are collected or delivered. All facility-level informants mentioned updating their stock cards when new stock was received, and all said that they send monthly reports to the health zone. One facility mentioned involving the community by also registering all received stock with the health committee.

PCA Intrans

At the time of data collection, UNICEF stated that there were no active PCA Intrans agreements, those for which UNICEF provides RUTF in-kind to an implementing partner without financing its delivery. UNICEF explained that during periods when RUTF is in short supply, it typically does not sign PCA Intrans agreements with partners, presumably because it needs to first supply its PCA and PRODOC partners because these agreements have financing associated with them. However, we were able to get some information about this type of agreement from Heal Africa, which had PCA Intrans agreements with UNICEF from 2014 to 2019, during which time all Heal Africa's RUTF supplies came from UNICEF.

Contracting Procedure

A key informant explained that Heal Africa approached UNICEF to request a PCA Intrans agreement. Heal Africa runs an HIV program with funding from another donor, Global Strategies for HIV Prevention. The agreement was that if UNICEF could provide the RUTF, Heal Africa could use funding from its ongoing HIV project to fund the distribution of the

RUTF to its sites. It was noted that during the period 2014–2019, when Heal Africa had these agreements with UNICEF, there were times when supplies were not available upon signing the agreements. In these instances, Heal Africa would contact PRONANUT to get supplies, or it would ask that UNICEF let it transfer unused RUTF from other program sites to serve its sites in Goma.

Key informants also explained that Goma does not typically have the levels of malnutrition required to receive support from UNICEF. However, because Heal Africa runs a referral hospital with a UNTI, children from across the health zone were coming for treatment. For this reason, the partner was eventually able to convince UNICEF to support selected project sites.

The PCA Intrans covered the provision of RUTF, formula 75 and formula 100 (F-75 and F-100) therapeutic milks, amoxicillin, vitamin A, deworming medication, and Rehydration Solution for Malnutrition (ReSoMal).

STOCK MANAGEMENT REPORTING SYSTEMS

As per government reporting requirements, RUTF stock data should be accounted for in the facility-level stock management tool, Registre d'Utilisation des Médicaments et des Recettes (Medication and Revenue Usage Record). Stock counts are also included on monthly, and sometimes weekly, IMAM reports that are sent to the partners and the BCZ.

One challenge is that much of this reporting is done on paper, especially at the health area level, and is then sent onward to the BCZ or a partner to be entered in digital systems. Indicators on RUTF stock are slowly being added by the government to the DHIS-2 and SIGL

systems; however, at the moment, data on RUTF in these government systems remain limited. Partners and UNICEF reported having their own—and different—digital supply management systems. Pathways and processes for data sharing varied. Therefore, it is not surprising that, notwithstanding all this data gathering, data availability is spotty, and even with efforts made on behalf of the Nutrition Cluster, it is very difficult to get a complete picture of the available level of RUTF supplies in the country.

Program Document (PRODOC)

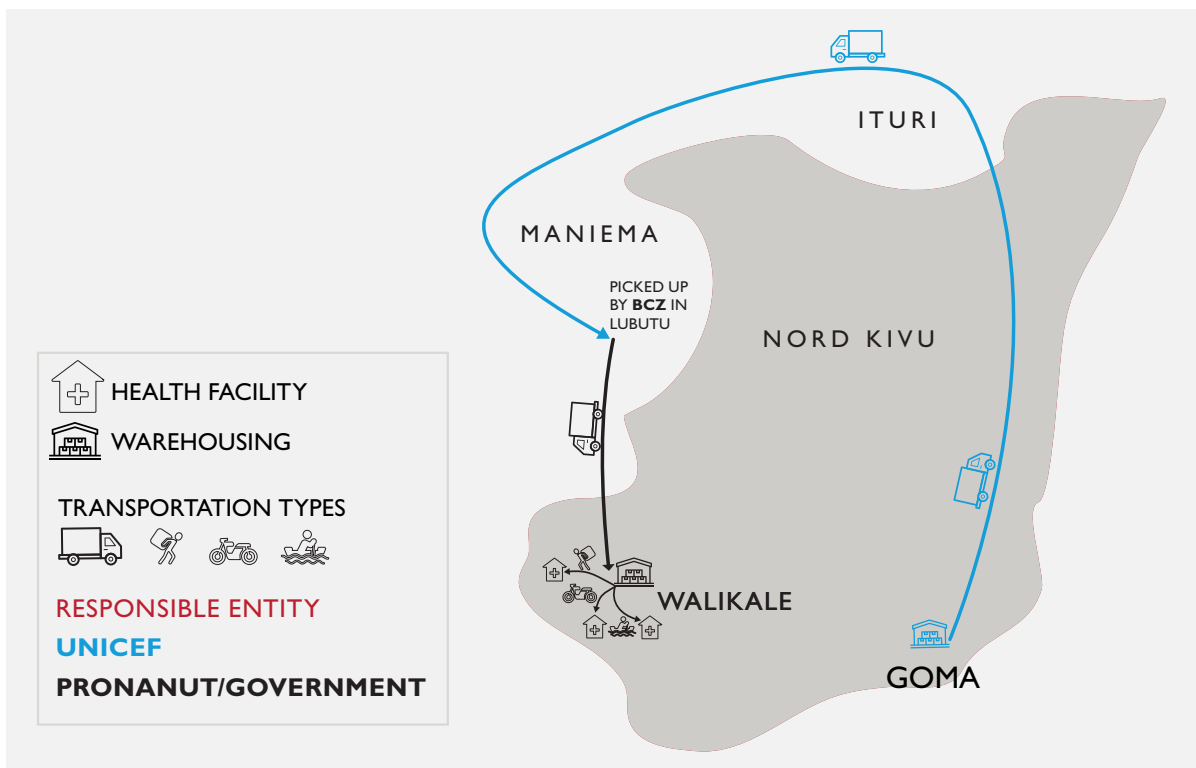
Partner: PRONANUT

Location: Walikale health zone, Nord Kivu

Key Findings:

- Supply quantities sent to the health zone are determined by UNICEF.
- Health areas place orders with the health zone, but amounts are often not respected.

Figure 6. Walikale Health Zone RUTF Transportation



Most provinces have a general PRODOC agreement with UNICEF that includes financing for an agreed set of activities. In some cases, the PRODOC is inclusive of the delivery of RUTF to health areas. The decision to include RUTF delivery in the PRODOC is made based on UNICEF's RUTF availability and the presence of other implementing partners in the area. We examined an example of this type of pipeline in Walikale health zone in Nord Kivu. Walikale is a largely rural health zone and among the largest in Walikale territory. The territory has experienced decades of political unrest and conflict, meaning that facilities are often in poor condition and the number of people seeking services varies due to population movements. Surveillance data from Walikale during the data collection period show that, of the children assessed at sentinel sites, 9 percent were wasted, with 1 percent having nutritional edema (MSHPH 2022). Figure 6 summarizes how RUTF is distributed in Walikale health zone.

Contracting Procedure

A key informant told us that the government signs a technical document with UNICEF on a biannual basis (every six months), and can include financing for the transportation of RUTF to certain zones, of which Walikale is one of the current zones. The technical document, or PRODOC, is signed with the DPS on behalf of PRONANUT. These agreements can also include such activities as financing for the transportation of UNTI referrals from communities or UNTAs to the treatment sites, support to caregivers of children admitted to UNTIs, drugs for routine treatment, stipends for *relais communautaires* ([RECOs], community volunteers) who conduct active case finding, and fuel for supervision visits. A gap specifically mentioned by PRONANUT in these agreements was the lack of drugs provision to manage wasting cases with medical complications in the UNTI.

There is a specific line in the current PRODOC that includes funding for wasting treatment support in Walikale, including funds for the transport of RUTF. However, given the complexities of moving products from Goma to Walikale by road, the transportation budget provided was said to be insufficient, with one key informant estimating that the entire transportation budget provided in its PRODOC was only \$5,000 for the entire year. In addition, PRONANUT's vehicle was described as very small and able to accommodate only 100 boxes, meaning that many trips needed to be made to supply the health zones. Using the standard UNICEF formula of 0.8 boxes to treat one child, PRONANUT's vehicle could carry only enough supplies to treat 125 children at a time. The PRODOC also includes a budget to support the Walikale BCZ with the onward transportation of RUTF to the health areas, but this was estimated to be less than \$50 per month.

Initial Supply Request and Receipt of Stock from UNICEF

According to a key informant who supports this pipeline, UNICEF determines the quantity of supplies that will be sent to the health zones, regardless of whether PRONANUT submits a specific supply request. The key informant also explained that UNICEF calls ahead before a delivery to ensure that there is space in PRONANUT's store to receive the supplies. If there is not sufficient space in PRONANUT's warehouse, stock can be kept in the UNICEF warehouse temporarily. (See the section "Warehousing" under "Stock Management Procedures" for additional details.)

Facility-Level Supply Estimation and Delivery Procedures

Once PRONANUT receives its stock from UNICEF, a distribution plan is drawn up. PRONANUT is responsible for the delivery of the RUTF from Goma to the targeted health zones. Transportation is by road. Key informants noted that other partners, such as Médecins Sans Frontières (MSF), use air transportation, which is faster and results in fewer stockouts, but given the small annual transportation budget allocated to PRONANUT, this does not seem to be a feasible option for them. The reported time it took to deliver RUTF from the province level to the health zone varied. At the province level, it was said that supplies remain in the PRONANUT warehouse for less than a week before they are distributed. However, at the health zone level, it was reported that it can take anywhere from one and a half to three months for supplies to be received. Road conditions and access issues contribute

to these delays. The route taken by PRONANUT to deliver the products is very long—some 1,600–1,800 km. The truck travels north from Goma to Ituri provinces, across to Tshopo province, and across to northern Maniema province. From there, the Walikale health zone team travels to the border and collects its supplies. There is a shorter, more direct route (400–600 km), but it cannot be used due to the poor condition of the road.

Once the supplies are collected by the BCZ, deliveries are made to health areas along the route from the border with Maniema province to the BCZ. On the team's arrival in Walikale town, the stock is stored at the general referral hospital warehouse adjacent to the BCZ. For inaccessible health areas, RUTF is distributed by motorbike, by boat, or on foot by the RECOs. Key informants noted the specific challenges of reaching these inaccessible health facilities and that they often experience stockouts. For example, we were told that when transporting products by motorbike, only around three and a half boxes are taken, enough product to treat only four children. On foot, it can take up to two days to reach some sites.

Health zones make orders to PRONANUT for the amounts required, although in Walikale, it was noted that these orders are typically not fulfilled and only partial orders are received. Health areas explained that when this happens, it is because PRONANUT does not have sufficient quantities on hand to supply the health zones. When this occurs, the health zone explained, emergency requests are often made to MSF. It was said that MSF does respond to these emergency requests, but it was difficult to know how long it would take, and the full amounts may not arrive in one delivery. Two facilities in Walikale mentioned borrowing stock from MSF, as did two different informants in Goma. Although we were unable to precisely quantify how often borrowing stock from MSF and other organizations occurs, it seems to be a fairly common practice at both facility and organizational levels. Partners, government officials, UN-affiliated staff, and health facility staff all commented on the reliability of MSF's RUTF supplies.

Stock Management Procedures

Warehousing

PRONANUT has a province-level warehouse that is guarded. Inputs are further secured by allowing items to be taken out only during "service hours," and through monthly stock card and inventory monitoring. However, it was noted that

the warehouse is quite small and that it “can’t hold 2,000 boxes,” meaning that sometimes UNICEF keeps supplies in its warehouse if PRONANUT does not have the space. PRONANUT informants mentioned that sometimes supplies are stored in offices but recognized that this practice was cause for concern. When supplies are kept at the UNICEF warehouse, PRONANUT loads its vehicles at the UNICEF site and then delivers the RUTF directly to the health zones. Using the average consumption rate of 0.8 boxes of RUTF to treat one child, 2,000 boxes of RUTF is enough to treat approximately 2,500 children. Data used for the 2022 HRP prioritization estimated the annual severe wasting caseload for Nord Kivu to be approximately 82,000 children, averaging around 6,800 children per month. Government storage alone is, therefore, far below the capacity required should RUTF be fully integrated in the government supply chain.

Walikale has only a small depot, and as mentioned previously, makes use of the depot at the nearby general referral hospital. Occasionally, a small quantity of RUTF is kept at the health zone’s own warehouse. These depots are monitored with stock cards. It was mentioned that rodents are a problem.

Informants from four of the five health areas stated that they have their own depots for storing RUTF, and one has a dedicated depot just for food products. Ndjingala health area shares its depot with Obayi health area because Obayi is not accessible by motorcycle or bike. RECOs come to the Ndjingala depot and carry the products on foot. Biruwe health area’s warehouse is used as a relay depot; it also stores products for other sites. Key informants from two health areas mentioned that their depots are locked; and key informants from two health areas mentioned that their depots are guarded (an informant from one health area mentioned both security measures). Key informants from four of the five health areas mentioned problems with rodents damaging the inputs, with one informant saying that a cat was bought in to help with the problem. Informants from two health areas mentioned that they store their RUTF on pallets—but still have problems with rodents. None of the key informants in Walikale mentioned problems with receiving expired RUTF, but one mentioned receiving products that were very close to expiring. All health area informants said that they had experienced stockouts.

Monitoring and Reporting

Key informants explained that PRONANUT does not have a separate report for inventory at the provincial level, instead that it prepares a general monthly report that includes reporting on inventory as part of “management reporting.” This report includes information on the stock on hand, amounts distributed, and the remaining balances. The report is sent monthly to the PRONANUT national office, the DPS, and sometimes to UNICEF.

The health zone receives monthly reports from the health areas and analyzes them. A key informant stated that the outcome of this analysis is used to inform the topics for supervision visits, but supervision of stock management was not specifically mentioned. However, the informant did specify that this reporting was used for inventory management at the health zone level. At the facility level, all visited facilities confirmed sending reports to the BCZ, with most confirming that this was done monthly. It does not seem that weekly reporting is common in Walikale. Only one facility mentioned sending weekly reports, but to MSF. However, because MSF is not the primary supplier of RUTF in Walikale and the nature of the reporting was not clarified, we did not include this in our summary analysis presented earlier in table 4.

Facility-level key informants in Walikale did not describe their stock management procedures in as great detail as informants in health areas in Kasaï Oriental. We also saw this pattern in the other two health zones in Nord Kivu. Only one facility in Walikale described a system where a delivery note is signed, stock sheets are updated with the newly received stock, and requisition forms are required to withdraw stock. Two facilities (not the one just described) mentioned using client-level data to confirm the amounts of stock dispensed.

In contrast, key informants at the province level were able to describe province-level inventory management systems much more clearly. These systems are used by PRONANUT to coordinate the stock received from UNICEF. Procedures include sending a receipt to UNICEF when inputs are received, developing a distribution plan for the health zones, receiving signed delivery slips from the health zones, and conducting follow-up to ensure that inputs are received. PRONANUT also completes monthly inventory checks, but we were told that “every month, you will see in our inventories, it is zero, every end of the month.”

THERAPEUTIC MILK SUPPLY

Although not the focus of our supply chain analysis, we asked key informants working in UNTIs about the availability of therapeutic milks (F-75 and F-100) and how shortages of these supplies impacted their use of RUTF and vice versa. All six UNTIs that we visited mentioned that they had at least some challenges with stockouts of therapeutic milks. Some noted that the stockouts were short-lived (around four days); however, for the critically ill children who require feeding with these milks, a period of four days without products could be life-threatening.

When asked about how supply disruptions of therapeutic milks impact the use of RUTF, the informants gave mixed responses. Some informants rightly noted that they have no impact because the children who require therapeutic milk need it because they cannot be given the RUTF. Others mentioned that a lack of therapeutic milk can lead to overconsumption of their RUTF stock.

Two facilities in Goma (one UNTI and one UNTA) mentioned making soy milk to give to children when therapeutic milk was not available. However, this is not endorsed as part of the DRC's IMAM protocol or at the global level as an appropriate treatment for severely wasted children.



PHOTO CREDIT: GWENN DOUBOURTHOUMIEU

A nurse prepares F-75 therapeutic milk for children in the UNTI at the Miabi hospital in Kasai Oriental. Children who require F-75 often cannot immediately be treated with RUTF due to the severity of their illness, making the availability of therapeutic milk critical for their survival.

NGO Direct Procurement and Importation of RUTF

Partners: Save the Children, PUI
Locations: Cilundu and Kasansa health zones, Kasai Oriental; Kibua health zone, Nord Kivu

- Key Findings:**
- Both Save the Children and PUI face importation delays at the border.
 - Save the Children sometimes delivers directly to health areas (Kasansa) and sometimes makes an interim stop at the health zone (Cilundu).
 - PUI has a zonal warehouse in Kibua where RUTF is stored before it is delivered to the health areas.

Figure 7. Cilundu and Kasansa Health Zone RUTF Transportation

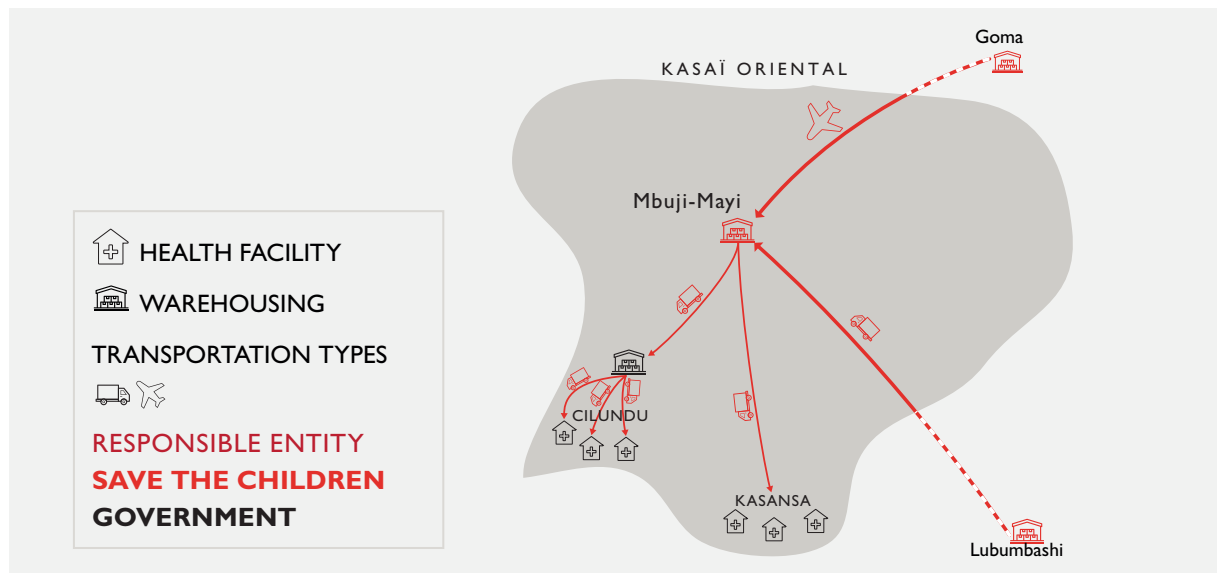
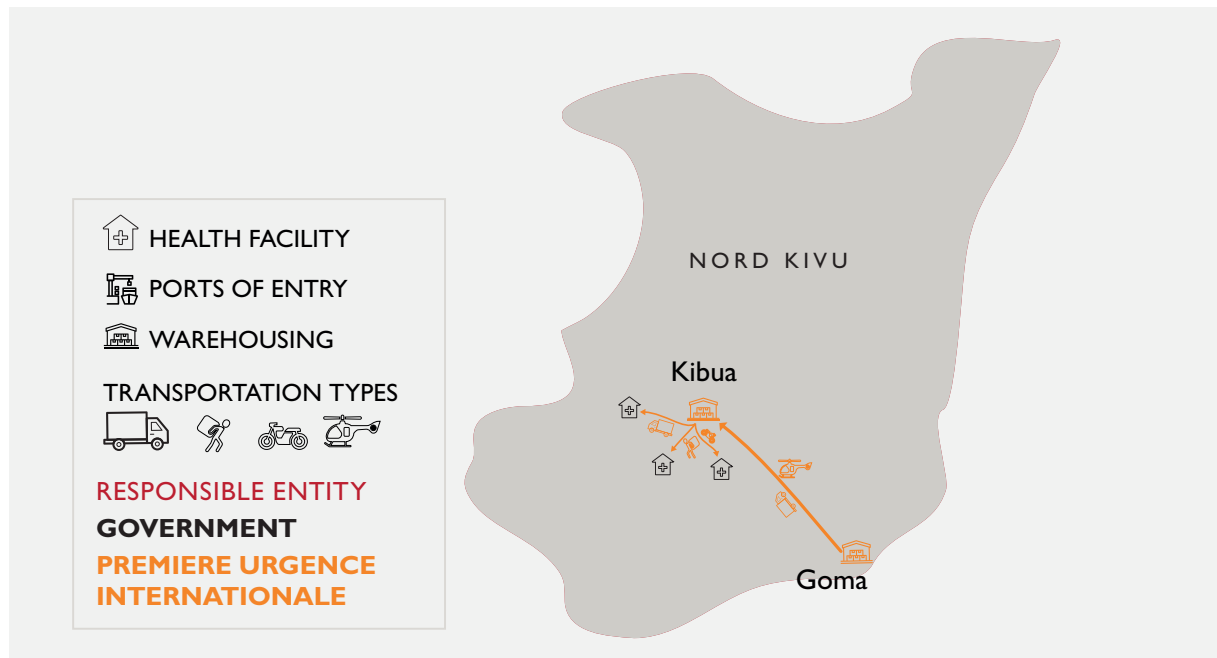


Figure 8. Kibua Health Zone RUTF Transportation



We studied two different examples of pipelines managed by international NGOs, from the procurement and importation of RUTF down to the delivery of the supplies to their target health facilities. In Kasai Oriental, we visited Cilundu and Kasansa health zones, supported by Save the Children. In Nord Kivu, we visited Kibua, supported by PUI.

The Kasai region of the DRC, which contains Kasai Oriental, is recovering from population displacement caused by ethnic violence in 2017. Moreover, an influx of Congolese returnees from Angola is putting additional pressure on the region's services. Both Cilundu and Kasansa health zones are large rural zones with poor road infrastructure. Surveillance data show that 19 percent and 8 percent of children assessed for wasting at sentinel sites were wasted in Cilundu and Kasansa, respectively. The percentage of children with nutritional edema was 2 percent and 3 percent, respectively, in these zones (MSHPH 2022). 2021 Standardized Monitoring and Assessment for Relief and Transition (SMART) survey data for Kasansa estimated a severe wasting prevalence of 1.2 percent (MSHPH 2021a).

Kibua health zone, like Walikale, has suffered from long-term conflict. It is also rural and health area access is difficult. Kibua's rates of wasting are much higher than in the other health areas that we visited. Surveillance data showed that 15 percent of assessed children at the sentinel sites were wasted, with 1 percent having nutritional edema. SMART survey data from 2021 estimated severe wasting prevalence at 2.4 percent and overall wasting prevalence at 13.8 percent (MSHPH 2021b). Overviews of the distribution of RUTF in the zones are provided in figures 7 and 8.

Contracting Procedure

Both Save the Children and PUI receive funding directly from BHA to support wasting treatment, including the provision of RUTF to health facilities. Activities under Save the Children's award, in addition to the procurement and delivery of RUTF, include comprehensive support to wasting treatment services, comprising training, follow-up, monitoring, prevention, and behavior change activities around IYCF and hygiene. Community-level screening by RECOs and household-level screening using the Family MUAC approach are also included. In addition, PUI works with RECOs to conduct community-level screening and referral for treatment at its supported health facilities. Save the Children's award was active from August 2021 to September 2022 and PUI's award with BHA is for one year, ending in October 2023.

Quantification of Needs

Both partners stated that their supply estimates are project-based, depending on the geographic area targeted by the project or program and the anticipated number of malnourished children. Save the Children informants did not mention specific details of how these calculations are made but said that they were done by their nutrition team. PUI bases its orders on average monthly consumption in the targeted areas and the number of anticipated beneficiaries. This calculation is done in consultation with the health zones. PUI informants mentioned having concerns about the number of malnourished children in Nord Kivu and noted that PUI often treats more children than were originally targeted. Informants explained that this often leads to supply shortages toward the end of a project.

Procurement

Save the Children procures RUTF from a variety of sources, depending on the volume needed and donor requirements related to procurement sources. International and regional-level procurements are done, but informants explained the organization has also had some variable experience using a local supplier, Association Régionale d'Approvisionnement en Médicaments Essentiels ([ASRAMES]; Regional Essential Drug Supply Association), which imports RUTF from abroad and resells it locally. All procurement requests for the partner's three regions are sent to the Save the Children office in Goma, where decisions about suppliers and order volumes are made.

PUI has a framework of prequalified suppliers. At the moment, its only RUTF supplier is Nutriset in France. Procurements are managed by PUI's Paris office in collaboration with PUI's team in Kinshasa. Final orders for Nord Kivu are collated in Goma and sent to the Kinshasa office.

Importation and Initial Stock Management Procedures

Save the Children receives stock via Kinshasa, Lubumbashi, and Goma, but highlighted challenges around customs clearance for international orders. Save the Children informants explained that they have not had exemption status since 2019, when the government ended general exemptions for NGOs. They have had an application pending with the government for more than a year and mentioned that other partners are in the same situation. This has led to unforeseen costs, including the need to hire a clearing agent, customs clearance costs, and incurring demurrage charges, which are not billable to all donors (e.g., they are unallowable under USAID agreements). These cumbersome procedures also limit the regular flow of products into the DRC. While waiting for their pending duty-free status, Save the Children has had to resort to emergency clearance

procedures, which it stated are limited to being triggered once per year. Given all the challenges with importation, informants from Save the Children estimated that it can take around six months to receive an international order of RUTF. Supplies coming from the regional Centrale Humanitaire Médico-Pharmaceutique in Nairobi, Kenya, were said to arrive more quickly, in two to three months, depending on whether the supplies were already on hand in Kenya.

Products imported by PUI usually arrive in Goma via Kenya or Dar es Salaam, Tanzania. Products are stored at its Goma warehouse. Goma was selected as the location for the main warehouse because of its proximity to the two main international supply routes. PUI informants mentioned similar challenges as Save the Children in terms of customs clearance and product testing delays before items can be sent to the field for use. It uses a forwarding agent to assist with these processes. Estimates from key informants on the length of time it takes for imported RUTF to arrive in the DRC ranged from four to seven months.

Although neither Save the Children nor PUI gave estimates of how long their supplies have been delayed due to customs, a UN-affiliated key informant stated that there had been cases where products had been blocked at the border for three to four months. Adding these importation delays onto the average shipping timeline of six months makes for a very long importation timeline for partners who have been unable to obtain exemption status.

Facility-Level Supply Estimation and Delivery Procedures

According to key informants supporting the RUTF pipelines in Kasai Oriental, health facility supply requests are sent to the health zone, where they are aggregated by Save the Children staff. Save the Children sends this set of requests to the province level, after which supplies are released for delivery to the health zone. However, when we spoke to health zone-level informants, we learned that the delivery processes were slightly different in Cilundu and Kasansa. For Cilundu, Save the Children delivers RUTF from its Mbuji-Mayi depot to the BCZ storage facility, where it is kept until Save the Children and the BCZ have made the health area distribution plans. Then they go together to make the deliveries. In Kasansa, RUTF goes directly to the health areas from the Mbuji-Mayi depot, bypassing the BCZ. This is due to the limited space available at the Kasansa BCZ to store the RUTF.

In Cilundu, it was stated that the health zone management team works “as a team” with Save the Children to review the requests from the health areas. They are checked against remaining quantities of supplies before a distribution plan is drawn up. The processes described in Kasansa were similar, although they were characterized as being less collaborative.

Facility-level staff in health zones supported by Save the Children said that they make supply requests based on their average monthly consumption, but were not able to clearly describe to whom supply requests were sent. Two informants, one in Cilundu and one in Kasansa, specifically mentioned that they sent these orders to the BCZ, which matches the process described by Save the Children staff.

However, in Cilundu, facility staff all said that they were at least sometimes involved in the planning process. In contrast, in Kasansa, none of the UNTA staff felt that they were involved in planning, and they all stated that they do not make orders; rather, Save the Children sends supplies to them based on what is available. The exception in Kasansa was the UNTI, which placed its orders with the health zone and felt more involved in the planning process. This could be because the UNTI is embedded in a hospital. Despite these differing supply request procedures, facility staff generally felt that the supply of RUTF provided was adequate, with informants at only three facilities (one in Cilundu, two in Kasansa) saying that they had experienced stockouts.

Key informants supporting RUTF delivery in Kibua stated that not all their locations are accessible year-round. PUI moves RUTF to the health zones by road when possible, but sometimes must rely on air transportation from the United Nations Humanitarian Air Service (UNHAS) or EcoFlight. Informants explained that access by road to Kibua health zone is possible for around five to six months only out of the year. PUI uses UNHAS helicopter flights to move products to Kibua when roads are impassable. Delays occur with both types of transport—road and air. Movement by road is slow even in the dry season due to the state of the roads. It was explained that UNHAS flights prefer to carry passengers rather than cargo. When cargo is accepted, the limit is 1.5 tons, which is often below a full order (orders could reach 10 tons, we were told). In addition, UNHAS has only one helicopter servicing the area, further limiting its availability. Last, the destinations requiring cargo deliveries are not among UNHAS’s regularly serviced sites; therefore, these trips are made by special

request and on an ad hoc schedule depending on availability of the helicopter. When supplies finally reach the health zone, they are sometimes transported on motorbikes or on foot due to poor road conditions.

Key informants explained that the amount of RUTF to send to the health areas is determined based on requests prepared by the health facility pharmacists. These orders are based on average monthly consumption. Project managers often try to calculate orders for a three-month period based on average consumption; orders are placed on a quarterly basis. Based on information from key informants, the health zone does not seem to be involved in the delivery process. The perception of the health facility-level key informants of their involvement in the RUTF planning process was mixed, with half (two) saying that they felt involved in planning. Informants from these same two health facilities also stated that they place their orders directly with the partner, whereas the other two facilities' informants were not clear about with whom they place their orders and felt that the orders were not respected, which may be part of the reason for these differences in perceptions of involvement. At all sites visited in Kibua, informants said that they had experienced stockouts.

Stock Management Procedures

Warehousing

Save the Children has large warehouses in Goma, Kinshasa, and Lubumbashi. In Kasai Oriental, Save the Children rents a warehouse in Mbuji-Mayi. It was mentioned that space in this warehouse is occasionally shared with Action Contre la Faim (ACF) when ACF's warehouse is full.

In Cilundu, Save the Children delivers RUTF to the health zone, where it is stored in a government warehouse before being delivered by Save the Children to the health areas. In Kasansa, Save the Children delivers supplies directly to the health facilities due to limited storage space in the Kasansa BCZ health zone-level depot.

PUI has central warehouses in both Goma and Kinshasa. The Goma warehouse services PUI's activities in Nord Kivu and Ituri provinces. The Kinshasa warehouse services activities in Kinshasa and Mai-Ndombe provinces. At the health zone level, PUI's zonal base offices have spaces where RUTF can be stored, including in Kibua.

In terms of RUTF quality, none of the Save the Children-supported facilities reported receiving expired RUTF. At one of the four PUI-supported facilities that we visited, informants

said that they had received expired RUTF. In the Save the Children-supported facilities, all sites reported having locked warehouses, and just over half (6/11) said that they stored the RUTF on pallets. One facility reported having trouble getting pallets; staff were using bamboo and bricks instead. In Kibua, informants at only one of the four sites said that their warehouse was locked; however, at one site, mention was made of a locked cabinet for the RUTF inside the warehouse. None mentioned using pallets to store RUTF.

Monitoring and Reporting

In the health zone supported by Save the Children, all facility-level informants stated that they prepare reports that are sent to the BCZ. It was also often mentioned that these reports are passed along by the BCZ to Save the Children. Only one facility in Kasansa mentioned producing weekly reports rather than a monthly report. Both Save the Children staff and health zone-level staff confirmed receiving the monthly reports. In Kasansa, health zone informants mentioned receipt of weekly reports as well. Save the Children uses these reports for inventory monitoring. The reports are also shared with monitoring and evaluation staff for the project where they are entered in a computerized inventory management system. At the health zone level, the Kasansa BCZ seems to use these reports to also aid in monitoring, and informants mentioned entering inventory data in the DHIS-2. For the Cilundu BCZ, it was said that these reports are usually examined closely but are followed up only if discrepancies are found.

The PUI Kinshasa office provides the overall monitoring for all PUI's stock nationally. In Kibua, all facilities visited prepare both weekly and monthly reports that are sent to PUI. In some instances, informants mentioned that the BCZ also receives copies of the monthly reports. Health zone-level informants confirmed that they receive monthly reports from the health areas and enter them in a database for inventory tracking. It was not specifically mentioned whether this is the SIGL system. The health zone also conducts supervision visits, but it was not mentioned whether supply-related tasks are included in those visits or how often they take place.

In terms of other stock management procedures, the systems were described in slightly more detail in the two Save the Children-supported health zones. Interestingly, there was at least one mention of community involvement in RUTF management in each health zone. In all cases, a community representative also signed the RUTF delivery slip or receipt. One facility in Kasansa also mentioned involving the community in doing the inventory.

BUFFER STOCK

Buffer stock (or security or safety stock) is “the buffer, cushion, or reserve stock kept on hand to protect against stockouts that are caused by delay in deliveries, increased consumption, or product losses” (USAID | DELIVER PROJECT, Task Order I 2011).

When we asked key informants about incorporating buffer stock in their planning or if buffer stock was available in case of shortages, we received a range of responses that did not align with this standard definition. In the DRC, buffer stock is more commonly defined as stock that is left with a health area or health zone upon the departure of an implementing partner. Generally, implementing partners indicated that this buffer stock was meant to last about two to three months following the end of implementing partner support, with a few informants indicating that it could or should last up to six months. Several key informants mentioned that because partners often experience target overruns, including children seeking treatment from neighboring health zones, this post-project buffer stock is often used before the project comes to an end, thus reducing the amount of stock that is left behind at the end of the project. In some instances, health facility staff described buffer stock as their “alert stock,” which was described as a stock level that, if reached, should trigger another RUTF supply request.

Some key informants mentioned that buffer stock levels were insufficient to respond to emergency situations, which is one of the primary purposes of holding buffer stock.

UN-affiliated informants explained that the availability of buffer stock was dependent on funding and that these provisions were made with their donors based on the targeting included in their proposals. One informant told us that ideally a minimum of 15 percent buffer stock should be included in their planning. When UNICEF then contracts with partners, the inclusion of buffer stock is dependent on the availability of resources at the time, and does not seem to be a contractual planning requirement for partners. UNICEF informants said that UNICEF does try to keep buffer stock at its warehouse in Kinshasa, and in case of a depletion of that stock, it can draw from supplies positioned in Cameroon at Douala.

BHA allows its NGO awardees to plan for buffer stock as part of their awards. Key informants stated that Save the Children keeps buffer stock in its central store to enable a response to health zone-level stockouts. Buffer stocks are included in both BHA-funded awards and procured using other funding sources. In some instances, Save the Children provides buffer stock that is kept at the health zone level. This was the case in Cilundu but not in Kasansa. PUI informants also confirmed that buffer stock is included as part of its planning and that it keeps a contingency stock in its ware-

house in Goma, which allows it to continue to support ongoing projects while waiting for the start of new projects. These stocks can also be used for emergencies. A UN-affiliated key informant noted that most partners do not have the capacity to keep buffer stocks, but that the Nutrition Cluster is trying to encourage this practice.

Although all organizations we spoke with that are importing RUTF say that they plan for buffer stock, how it is calculated, where it is kept, how it is accessed, and knowledge about its availability were not clear in the interviews. Moreover, when we asked about processes for placing emergency orders for additional RUTF should the need arise, we again did not get clear information about how this could be done. We were often told that this situation had not arisen, despite the shortages of RUTF at the health zone and health area levels. A lack of funding for adequate RUTF stock seems to be one of the main barriers to ensuring that enough buffer stock is available.

Donors give us money just to intervene, for a certain amount, for a given target population. If something happens after that, we start to struggle a bit. We really advocate with donors that they really try to take into account the contingency stock, which practically does not exist in our UNICEF stocks. In these cases, we start to look a little left and right, where can we grab a few boxes of Plumpy’Nut to meet the needs of an emergency that happens in such or such other health zone. We really have serious problems with that, and we would really like donors to listen to us on that matter.

—UN-affiliated key informant

UNICEF also mentioned challenges about being able to repurpose RUTF from one project to another, thus limiting its ability to procure and maintain a true, flexible buffer stock at the national level.

The big question is this buffer stock, is it a common buffer stock or is it a national buffer stock? Can this buffer stock be used wherever it is needed or not?

With BHA, the boxes are already granted. We do not have the ability to use these boxes to meet the needs of people in other projects.

— UN-affiliated key informant

Given the changeable landscape in the DRC, the availability of buffer stock that can be quickly deployed seems critical to ensure that needs stemming from both unforeseen emergencies and intermittent supply chain breakages can be met. Based on the information we have gathered, there is much room for improvement in this area.

PIPELINE PERFORMANCE

We defined pipeline performance based on the reliability of supply provision by the partners and the availability of RUTF at the visited health facilities. We assessed each health zone pipeline using a quantitative tool to gather data on key indicators, such as rates of stockouts on the day of the visit, stockouts according to records, and whether the quantity received was equal to the quantity ordered. Table 8 summarizes the findings from our records review and staff recall on stockouts.

First, a few words on how to interpret the indicators shown in the following sections. Several indicators assess whether there has been a stockout in the previous six months, whether the facility was currently stocked out, and the percentage of time stocked out in the previous six months. In a well-functioning supply system, all would be zero or near-zero. Although perfection can be difficult to achieve, in general, stockouts should be rare in a well-functioning supply system. Where stockouts are a frequent occurrence and/or are common across many health facilities, this indicates a supply system that is seriously out of balance. We generally assess stockouts several different ways to triangulate the extent of the problem: facilities that are stocked out on the day of the visit show that the problem is immediate and ongoing. We also assess whether facilities have been stocked out in the recent past (both through records review, and by staff recall for when records are incomplete or unavailable). This tells us that even if facilities generally have stock currently, widespread recent stockouts indicate that there is still a problem.

We also assess the degree of stockouts, (i.e., the percentage of the time stocked out), to get a sense of the scale of the problem. For example, is this a one-off but widespread occurrence where all facilities in a region are stocked out for a short period but have otherwise been okay, or were facilities generally stocked out for a significant period of the time assessed? The “percentage of time for which the facility had records over the previous six months showing it was stocked out” indicator is meant to get at this. However, interpretation of the percentage of time stocked out can get challenging when records are incomplete because it is hard to know what was happening during the time for which we lack records. For example, we often see facility staff stop keeping records when the facility is stocked out and do not resume recording in their stock card until the facility receives more stock. This is understandable, although standard operating procedures often

demand that a monthly stock count be entered in the stock card, even if the stock count is zero, in which case we would have some confirmation that the stockout was ongoing. Lacking this, it is hard to know what happened in the interim if, for example, a stockout was recorded five months prior, and then nothing was written in the stock card until two weeks prior when the stock card indicates having received some stock. Was the facility really stocked out for that entire time, or might it have received stock and just not entered it in the stock card? In such cases, we instructed data collectors to treat months where nothing is written in a stock card as containing no data. The indicator for “percentage of time for which the facility had records over the previous six months showing it was stocked out” may therefore be a conservative estimate of the actual amount of time that the facility was stocked out over the period analyzed. However, again, this interpretation should be made with caution because, by definition, we do not really know what was happening during the months for which there are no data.

One of the indicators in the following sections assesses how much stock each facility had on hand, and how this compares with what it would be expected to have on hand given its recorded consumption or stock use:⁷ “have records that indicate the facility has less than one month of stock left (including 0).” We talk about “months of stock” rather than quantities because different facilities will have different rates of use for each product they manage and, therefore, best practice is to manage inventory according to a “min/max” ordering system. This system defines how much product facilities at each level of the system should keep on hand to serve their clients in terms of multiples of their average monthly consumption. These stock levels are usually set according to a formula, where the minimum stock level is equal to the amount of stock needed to cover the lead time (time between placing and receiving an order) plus a buffer typically equal to half the review period (the period of time between placing orders). The maximum stock level is then the minimum plus the review period. For example, if facilities place bimonthly orders and it takes a month between placing an order and receiving it, then the minimum stock level might be two months (one for the one-month lead time plus half of the two-month review period). However, this is a baseline, and countries can decide to increase the level of buffer stock that facilities should keep on hand, especially where transportation is lengthy or unreliable; the minimum stock level would therefore be increased to account for these occasional delays.

According to the DRC's logistics system manual, which covers nutrition products, including RUTF, the minimum stock level for the facility level is one month of stock, whereas the maximum is three; meaning that in the normal course of serving clients, facilities should expect to always have between one and three months of stock on hand for each product they manage, including RUTF (Ministère de la Santé Publique 2020). This indicator therefore assesses whether each facility had at least the minimum amount of stock that it is expected to have on hand, based on its recorded consumption over the previous six months. An important caveat is that in calculating average consumption over the previous six months, we are not attempting to adjust for time when the facility was stocked out and, therefore, there was no consumption. For facilities with significant stockouts, their calculated average consumption is therefore conservative (low) compared with what they might have expected to consume if they had been able to keep the product in stock for the entire time frame. This results in the indicator being easier to achieve because the stock at each facility is compared with what the facility actually consumed, rather than what it might have consumed in better circumstances.

Last, table 5 includes “throughput of RUTF sachets recorded over the previous six months (range).” Throughput is not itself an indicator and there is no “good” or “bad” level of throughput. This is instead provided as a marker of the relative importance of each facility or health zone, based on

the amount of RUTF consumed. For example, if one health zone consumes twice as much RUTF as another, then it might be said that a stockout in the higher-consuming health zone has worse implications in terms of the number of clients who are likely to need service but are unable to get it while the stockout continues than a stockout at the lower-consuming health zone. One caveat is that similar to the average monthly consumption figures discussed previously, the throughput is not adjusted for periods of stockout, and it is expected that throughput at health zones that had long periods of stockout would have been higher had those stockouts not occurred.

As illustrated in table 5, according to the quantitative data that we collected, all health zones had sites that experienced stockouts in the past six months. In terms of overall performance, based on the fewest number of stockouts in the past six months, facilities supported by Save the Children in Cilundu and Kasansa fared the best. Although not all stock records were complete, based on available records, the Save the Children-supported facilities in Cilundu had the shortest stockout periods. Although the supported sites experienced stockouts, PRONANUT-supported Walikale health zone also seemed to perform reasonably well by comparison, being one of just two health zones (the other being Cilundu) where none of the visited sites were stocked out on the day we visited. Goma health zone, which has no dedicated partner (e.g., implementing partner or UNICEF) support, unsurprisingly fared the worst across all areas we investigated.

7. As a reminder, “consumption” in the context of supply chains means that the product is provided to clients, either for immediate use at the facility or to take home for use away from the facility.

Table 5. Summary of Stock Records Review Data and Stockout Recall by Health Zone⁸

Indicator	Kasaï Oriental			Nord Kivu			All Health Zones
	CilunduSave the Children–NGO Procurement	DibindiSocial Development Center–PCA	KasansaSave the Children–NGO Procurement	GomaNo Defined Partner/ Pipeline	Kibua PUI–NGO Procurement	Walikale PRONANUT–PRODOC	
Staff recall stockout in the previous six months	3/5	5/5	2/5	3/3	3/3	5/5	81% (21/26)
Of facilities that had updated stock cards, number that showed stockout in the previous six months	3/5	5/5	1/4	1/1	3/3	5/5	78% (18/23)
Stocked out on the day of the visit	0/5	2/5	2/5	3/3	2/3	0/5	35% (9/26)
Have records that indicate the facility has less than one month of stock left (including 0)	3/5	5/5	5/5	3/3	3/3	5/5	92% (24/26)
Throughput of RUTF sachets recorded over previous six months (range)	4,663–9,700	20,938–35,039	5,057–12,296	2,100–2,550	3,518–6,575	5,206–20,741	41,482–86,901
Number of days recorded as stocked out over previous six months (range)	5–12	27–93	28 ⁹	44 ¹⁰	27–109	19–62	--
Number of months of data available on stock cards in the previous six months (range)	6	4–6	3–6	2–4	6	5–6	--
Percentage of time for which the facility had records over the previous six months showing that it was stocked out (range)	3%–7%	15%– 72%	31%	37%	15%– 61%	11%– 41%	--

8. The table is shaded in a three-tier “stop light” pattern to assist in the interpretation of the indicator results. Differences among the colors are based on our subjective assessment of the scores in each area. Throughput is not scored because it is not itself good or bad, but instead is an indicator of the relative importance, in terms of reported consumption of RUTF, of the different health zones.

9. Of the five facilities visited in Kasansa, two were stocked out at the time of the visit, but only one of the five had detailed stock records available for review.

10. Although all three facilities in Goma were stocked out at the time of the visit, like Kasansa, only one of these facilities had detailed stock records available for review.

We took a closer look at the qualitative data for each health zone to try to ascertain what might be driving the stockouts for the zones. In Goma, for example, the lack of a plan for RUTF distribution is clearly what is causing the supply disruption for those health areas.

Dibindi health zone in Kasai Oriental is an interesting case. Given its urban location and proximity to its partner's depot, it may be assumed that it should have fewer stockouts; however, all visited sites reported stockouts. Based on interviews with the implementing partner, the first challenge seems to be an irregular supply of products from UNICEF that, in turn, disrupts the supply schedule to the health facilities. Implementing partner informants told us that although the total amount of RUTF assigned to them did arrive over the project period, it did not always come at the times and in the total amounts as per its PCA. Also, it is important to note that SDC's PCA was extended by two months to account for an initial one-month delay. However, that is still inclusive of one additional month of operations without an increase in the total amount of RUTF supplied. If orders are to be based on health facility needs, then it is not possible that this stretched amount of RUTF could be sufficient, based on average monthly consumption. Health facilities also noted that the partner had problems with transportation, with informants saying that in the case of stockouts, they were told by SDC that the vehicle had broken down. Dibindi, despite being urban, also has some challenging sites due to the ravines in the city's geography, further underlining the persistent challenge of transportation in the DRC. Transportation challenges also seem to be the main drivers of stockouts in the other health zones. For Cilundu and Kasansa, problems include intermittent delays moving stock from Kinshasa while waiting for cargo flights to

accumulate sufficient goods to then agree to a flight, and the poor state of the roads in the health zones, especially during the rainy season. Kibua and Walikale have similar problems with the transportation of stock to the zones—both poor roads and a lack of flights—but with the added complexity of insecurity that can also disrupt planned transportation routes and schedules.

At higher levels of the supply chain it is worth noting that UNICEF, Save the Children, and PUI had similar timelines for product importation—around six months. However, for NGO actors, there is additional uncertainty around waiting for products to be cleared by customs, tested for quality, and released for distribution. In terms of the amount of RUTF ordered, Save the Children did not express any specific concerns with not having enough supplies for its projects. As noted previously, stockouts seem to be driven by transportation delays rather than a lack of supplies. PUI mentioned that it tends to have challenges with supply availability at the end of its projects due to target overruns. As highlighted earlier, these target overruns can be caused by population movement or by individuals coming from neighboring health areas or zones for treatment. According to UNICEF and observations by the Nutrition Cluster, the biggest challenge is a lack of funding to ensure adequate supply to meet needs. Targeting should also be considered here because prevalence calculations and prioritization are often done with outdated data due to a lack of SMART surveys.

We also asked informants in the health areas about whether they typically receive the quantities of RUTF that they order and how long it takes to receive their RUTF orders. These findings are summarized by pipeline type in table 6.

Table 6. Summary of Order Quantities versus Quantity Received and Order Speed

Indicator	Kasaï Oriental			Nord Kivu			All Health Zones
	CilunduSave the Children–NGO Procurement	DibindiSocial Development Center–PCA	KasansaSave the Children–NGO Procurement	GomaNo Defined Partner/ Pipeline	Kibua PUI–NGO Procurement	Walikale PRONANUT–PRODOC	
How often RUTF quantities received match quantity ordered	Always: 5/5	Rarely: 1/5 Never: 4/5	n/a*	Rarely: 1/3 Never: 2/3	Sometimes: 3/3	Always: 1/5 Sometimes: 3/5 Rarely: 1/5	Always: 29% (6/21) Often: 0% (0/21) Sometimes: 29% (6/21) Rarely: 14% (3/21) Never: 29% (6/21)
Record review: order compared with quantity received (of the number of facilities with records available)	Received what was ordered: 4/4	Received less: 4/4	n/a	Received what was ordered: 1/2 Received less: 1/2	Received what was ordered: 1/2 Received less: 1/2	Received what was ordered: 1/5 Received less: 4/5	Received what was ordered: 41% (7/17) Received less: 59% (10/17)
How long it takes for RUTF orders to be filled	Less than 2 weeks: 5/5	Less than 2 weeks: 1/6 2 weeks–1 month: 4/6 1–2 months: 1/6	Less than 2 weeks: 3/5 2 weeks–1 month: 2/5	More than 3 months: 3/3	Less than 2 weeks: 3/3	Less than 2 weeks: 5/5	Less than 2 weeks: 63% (17/27) 2 weeks–1 month: 22% (6/27) 1–2 months: 4% (1/27) More than 3 months: 11% (3/27)

* Informants at all five facilities in Kasansa reported that they do not order specific quantities because resupply quantities are determined at a higher level.

COPING WITH STOCKOUTS

Informants from implementing partner organizations who are directly purchasing RUTF mentioned that they have had to resort to borrowing stock from other partners to help fill supply gaps. Both organizations seemed to suggest that this was almost a given and part of their planning, especially in situations where there are countrywide shortages of certain inputs. An example was given of therapeutic milk, of which we were told there was a general shortage in the second half of 2022. Although not specifically mentioned by the partners, other contributing factors that may influence the need to borrow stock include uncertain importation timelines due to customs procedures and transportation challenges. For example, stock may be available in central or regional-level warehouses, but poor road conditions or a lack of transportation may mean that it cannot reach the health facilities on time. The Nutrition Cluster plays a large role in facilitating sharing of stock between implementing partners. However, all of this is done informally, and we did not reach out to the partners that were frequently cited as product “lenders,” such as ACF and MSF, to see how these requests impact their planning and programs.

We asked health facility staff what their procedures were in case of a stockout. First, most informants said that they would alert either their partner or the BCZ to tell them they needed additional supplies. Only in Cilundu did it seem that these requests were consistently and quickly met (within a matter of days). The results of these emergency requests in the other zones were less clear. Support from the BCZ to advise on borrowing from other health areas was mentioned by several informants. Staff at one facility in Goma mentioned that they had purchased their own RUTF from ASRAMES, but only a few boxes.

The consequences of these shortages fall on the children. The majority of the facilities had strategies in place to mitigate the consequences as much as possible. The most common response was to provide some type of IYCF-related support, from nutrition education to counseling on home feeding and diet fortification (using local items like soy, peanut, banana, and potatoes). Health facility staff even produce their own products, such as soy milk or fortificants, to help fill gaps; however, these alternatives are not part of the DRC’s IMAM protocol or global standards for the treatment of severe wasting.

We make children and mothers aware, we explain, there are other methods, we will explain with cooking demonstrations. Then we will explain to the mother how to prepare, even at home. Because we have a stock shortage, we can't just wait for the RUTF to be brought to us. Even the corn flour must be bought there. You buy the peanuts and caterpillars. You mix the caterpillars and the peanuts, grind them. You take a quantity; you prepare the porridge and you take a quantity of the peanut powder and mix it with the caterpillars. You add it to the porridge, you boil it; as soon as it boils, it is good. You put in the quantity of oil, then a small quantity of sugar. Then you give it to the child while waiting for the RUTF to be brought to us.

—Facility-level informant from Dibindi health zone

Staff at a handful (6 of 33) of facilities said they try to refer children to another facility, but one informant from a facility in Kibua said that stockouts often impact all facilities at the same time. Another small number of facilities (7 of 33) did not mention any action other than explaining to mothers that they are stocked out and that they must wait for the products to arrive.

Health facility staff stated that the stockouts were leading to poor results for children, often causing relapse or prolonged periods in treatment, both of which put further pressure on limited RUTF stock.

Because we give one-week appointments, the person came, the second week, the consumption, we are done. It's like we just gave the child a taste of the inputs. What are the consequences? It's dropouts, it's relapses, it's anything that can happen.

—Facility-level informant from Goma health zone

We, as in our health area here, we are in remote areas, we can find ourselves with the quantity that we were served, which is already out of stock and the children are not cured. What do I mean by this? The non-involvement of the nurse by the partners often leads to relapses. The child who has to get his quantity regularly, it happens that he has taken two, three times and the quantity is over, we have run out of stock. Instead of him being able to be cured, he's starting over as if he's a new case; a relapse case that I told you about there.

—Facility-level informant from Dibindi health zone

PIPELINE COST DRIVERS

The unpredictable and variable nature of transportation for RUTF, including the frequency of delivery and mode of transport, made it impossible for us to determine the different costs of transportation for the various RUTF pipelines examined as part of this exercise. The cost of air freight, despite its being named the fastest method of transportation, was consistently said to be cost prohibitive and used sparingly.

Surprisingly, no one mentioned the cost of RUTF itself as a barrier to ensuring adequate supply. Instead, informants framed the challenge as a general lack of funding to support wasting treatment for all children who need it.

Although a detailed costing analysis was not possible within the scope of this activity, we were able to examine differences in key cost drivers among pipelines to explore whether there might be important differences in their cost structures. For example, if one pipeline delivers RUTF supplies all the way to the health facilities at the expense of the implementing partner, while another pipeline requires facility staff to travel to the partner's warehouse to collect its RUTF supplies, it can be said with confidence that the former pipeline has a higher cost structure from the point of view of the implementer, and that the latter places an additional cost burden on the facilities (in terms of time and expense to travel to collect supplies) that the former does not. However, if staff from health facilities already have to travel regularly and are able to pick up their supplies while doing so, then this travel may not represent an additional cost to the facility. For example, staff may have to travel to their nearest city regularly, either for official business, such as reporting to their superior, or on personal business, such as doing their banking.

Another example is that if one pipeline performs better (has fewer stockouts) while delivering RUTF supplies every other week, whereas a second pipeline performs worse while delivering RUTF supplies every other month, it might be important to know that the second pipeline likely also has lower transportation costs than the first because transportation is undertaken much less frequently. One could then ask why the second pipeline delivers less frequently—that is, whether transportation cost might be a factor driving that structure, and whether an increase in spending on transportation might be worth it if this enables better performance. Conversely, if two pipelines perform the same, but one delivers less frequently than the other, then

it might make sense to see whether the partner delivering more frequently could save on transportation costs (by reducing transportation frequency) without negatively affecting performance.

Regarding whether supplies are delivered to health facilities or whether facilities are expected to travel to collect them, we discovered that all three pipelines (PCA, PRODOC, and NGO direct procurement under both Save the Children and PUI) deliver RUTF supplies all the way to the health facility level. The only exception among the health facilities visited was Bilobilo health facility in Walikale, served by the PRODOC pipeline, whose staff reported that they sent someone to collect supplies by motorbike to a location 30 km away. However, Bilobilo informants also reported that staff normally has other reasons to make these trips, and does not make them exclusively for the purpose of collecting RUTF supplies. In Goma health zone, where there is no partner support, all four health facilities reported that they had to collect their supplies; they were not delivered by a partner to the facility, although three of the four reported that they collect the RUTF while making a trip for other reasons. It is unclear whether facilities in Goma normally pick up their own supplies because the health facilities currently lack a clear partner agreement or simply because Goma is a large city where it is relatively easy for health facilities to travel to pick up their RUTF supplies. Based on key informant interviews, it does seem that when facilities are supported by a partner, such as Heal Africa, the partner handles the delivery, but this information was not consistent.

Another reason that the costs might differ among pipelines is the method of transportation used to deliver the RUTF supplies, although this can sometimes be driven more by how accessible a health facility is rather than by the methods of transportation used by the partner delivering supplies. Of the 22 health facilities visited that reported that supplies were delivered to them, 4x4 vehicles were the most common method of delivery, including all 10 facilities in Cilundu and Kasansa (served by NGO direct procurement: Save the Children). In addition, all five Dibindi health facilities (served by PCA: SDC) reported that supplies arrived by public transportation (such as a bus or a bush taxi). Transportation was more varied in the Nord Kivu health zones: two facilities in Kibua (served by NGO direct procurement: PUI) reported that supplies arrived by motorbike, and the third reported that they arrived by bicycle. In Walikale (served by PRODOC:

PRONANUT), two facilities reported being served by a 4x4 vehicle, one by motorbike, and one by car. For those facilities that reported going to pick up their own supplies, the one facility in Walikale reported staff going by motorbike; in Goma health zone, three facilities reported going by 4x4 vehicle; and the fourth reported collecting its supplies by cart (such as a pushcart or donkey cart).

Frequency of resupply did not seem to have a clear correlation with supply chain performance as defined by the frequency of stockouts. The majority of health facilities (14 of 23 surveyed, not including Goma health zone) reported being resupplied every month, on average, including all five health facilities in Kasansa (NGO direct procurement: Save the Children) and all five facilities in Walikale (PRODOC: PRONANUT). In Cilundu (NGO direct procurement: Save the Children), two facilities reported being resupplied every week or every other week, and the other two facilities reported being resupplied only quarterly. In Dibindi (PCA: SDC), two facilities reported being resupplied monthly and the other three reported being resupplied every other month. Last, in Kibua (NGO direct procurement: PUI), two facilities reported being resupplied monthly, and the remaining facility reported being resupplied every week. Even without considering the pipeline type, there still does not seem to be obvious correlation between frequency of resupply and supply chain performance because 1 of the 3 facilities that reported being resupplied more frequently than monthly was stocked out on the day of the visit (33 percent), compared with 3 of 14 facilities that reported monthly resupply (21 percent), 2 of the 3 facilities that reported bimonthly resupply (66 percent), and only 1 of 4 facilities that reported quarterly resupply (25 percent).

UNDERLYING CHALLENGES AFFECTING RUTF AVAILABILITY

Stockouts of RUTF are clearly a challenge for all health areas and health zones that we visited, and based on information shared by individuals at the provincial and national levels, these problems are not unique to the sites we visited. In the following sections, we try to identify some of the main challenges key informants felt were contributing to the unreliable supply of RUTF.

Transportation Infrastructure

Problems with transportation, specifically poor infrastructure, were by far the most common challenge mentioned by key

informants across all levels of the system and geographic areas. Eighty-four percent of informants (61 of 73) stated that transportation was a challenge. More than half that number specifically mentioned the poor state of the roads, and that in the rainy season, accessibility becomes more of a challenge for certain facilities.

As described previously in the pipeline descriptions, partners respond to the road conditions in many different ways, from using motorbikes, and boats and even transporting cartons of RUTF on foot. Air transportation was noted to be the best and fastest option, but often the cost is prohibitive. Informants said that these infrastructure-related problems can increase delivery times, causing unpredictable delays resulting in facility-level stockouts. An example was given of a road that was completely washed out in Sud Kivu, making some areas inaccessible for six to eight months. These types of problems are difficult to plan for and with transportation budgets often said to already be inadequate, flexibility to adapt to these changeable conditions is limited. This not only affects implementing partners but can also affect UNICEF's overall operations. Another factor that significantly impacts transportation planning is security. This was a problem that was almost exclusive to sites in Nord Kivu, except for one mention of "customary conflict" in Kasai Oriental. Due to insecurity caused by the March 23 Movement in Nord Kivu and the surrounding areas, RUTF sometimes has to be diverted from Goma through Uganda or Rwanda to reach the more northern regions of the province. Again, this has important budget and time implications for the deliveries.

Another common challenge mentioned related to transportation was the lack of vehicles or the use of vehicles that were inappropriate to the conditions. Vehicle capacity is sometimes insufficient to bring enough RUTF to the facilities or to serve more than one or two facilities at a time, resulting in more trips and longer wait times. In Goma, where there is no clear plan for RUTF delivery, it was mentioned that the health zone does not have a vehicle to bring supplies to the facilities and that facilities have to pay to pick up supplies themselves, thus creating cost barriers.

Last, there were frequent mentions by key informants in all three health zones in Kasai Oriental, but with the majority from Kasansa, that planning for deliveries was not done well. This issue was even raised at the provincial level by government officials. Informants from Kasansa specifically mentioned that

they had problems with delivery drivers not allowing them time to adequately count and check their orders upon delivery.

Can a driver who has to leave the Plumpy’Nut in three or five structures wait for you so you can count with him? He’ll tell you, ‘No, I’m wasting time.’ He’ll tell you, ‘No, be quick. Give me—sign the delivery notes and give them to me.’ [...] With problems like this, it’s going to make us uncomfortable.

—Facility-level informant in Kasansa health zone

The driver is not coached that when he arrives, he has to depend on the facility to count and check. The driver is always in a hurry, saying ‘No, I don’t just have you, I have other facilities.’ At that point, the facility only counts the boxes. When it remains to count the bags, we know that 10 boxes should give us, for example, 1,500 Plumpy’Nut but we go to [the facility’s] reports and [see they have written] 1,350. When we ask [why there are fewer, the facility says] ‘No, there were the shortages.’ The missing ones [were not reported] at [delivery] time, so Save will not accept and we at the central office will not accept either. [...] it is necessary that our partner coaches the drivers to wait [and] we count bag by bag, so that what will be in the reception report reflects the reality of the Plumpy’Nut supply.

—Health zone-level key informant in Kasansa health zone

Interestingly, implementing partner key informants also mentioned delivery coordination as an occasional challenge but at the level of the health zone, with BCZ officials not available at the arranged time to make the deliveries to the health areas.

Warehousing Infrastructure

The topic of warehousing infrastructure was often brought up alongside transportation-related challenges. When mapping the various RUTF pipelines, one of the common reasons that supplies travel directly from a central or regional warehouse to the health areas is because health zones do not have adequate or appropriate storage space for the supplies. Kasansa is a good example of some of the challenges this causes. Not only do health zone and health area officials in Kasansa feel less engaged in the RUTF planning processes compared with counterparts in Cilundu, where RUTF is stored at the BCZ, but transportation challenges lead to delays and difficulties in planning delivery schedules. If supplies could be stored in the health zone, some of these issues could be alleviated.

Now, we have to make many rounds, Mbuji-Mayi, health areas, Mbuji-Mayi, health areas and all that. That’s maybe the difficulty,

really at the level of the area, we don’t have a warehouse where we can store the Plumpy’Nut. We don’t really have a framework or a storage space.

The challenges are the lack of [government] depots at the zone level. If we really have a depot at the zone level, it will minimize the cost of transportation and perhaps as soon as there is a threat of a shortage, the zone can easily obtain supplies without going through orders and all that. That’s it, at the level of this zone, what I observe is the lack of depots at the level of the BCZ, a relay depot that should serve the storage of inputs at the level of the central office for quick responses to stockouts.

—Implementing partner key informant, speaking about the situation in Kasansa

A lack of storage capacity at the health area level was also mentioned as a challenge by key informants. A key informant from UNICEF noted that the limited space meant that it was sometimes not able to plan on a monthly or even quarterly basis because there is not enough room to keep that quantity of inputs. This is an important point. Because many health areas become inaccessible at certain times of the year, a lack of storage space limits the ability of partners to pre-position enough stock to support the facilities through these periods of inaccessibility. Several key informants also mentioned the need for more relay depots to help better respond to shortages and located closer to hard-to-reach areas. UNICEF also noted that one of the reasons that storage infrastructure has not been improved could be because nutrition commodities have not been integrated in the national supply chain. Several other key informants from partner organizations and UNICEF also expressed the desire for nutrition commodities to be integrated in existing systems.

The main challenge we have in the DRC that we have been able to identify is the non-integration of nutritional inputs in the state supply chain. This non-integration has a direct impact on the storage infrastructure because the current state shows that there is a deficit in the state storage infrastructure, both at the district level and at the health zone level. This lack of storage infrastructure is directly related to the fact that nutritional inputs are not fully integrated. The volume of nutritional inputs is known. Today, if we say that we are going to integrate nutritional inputs in the government’s supply chain, this will require that we review and strengthen the storage infrastructure. Unfortunately, until now, nutritional inputs have been operating in a parallel circuit, which is not desired.

— UN-affiliated key informant

STOCK LEAKAGE

Globally, information about RUTF misuse and “leakage” is limited because it is often not documented or reported by organizations (Mates and Sadler 2020). We did not conduct a full audit of supply records, registers, and client cards as part of our work, which would be needed to try to determine the extent to which leakage is a problem. Although when asked about measures to minimize RUTF stock leakage and theft most key informants assured us that their warehouses were well secured, examples of these problems were shared with us.

In Kasai Oriental, at least two instances of theft or attempted theft were reported to have taken place at the BCZ, meaning that RUTF is no longer kept in those locations and instead goes directly to the health areas. Transportation of RUTF by handlers was one point along the supply chain where informants expressed suspicion of theft because facilities reported sometimes receiving open cartons of RUTF with bags missing. When RUTF is transported on foot, one informant mentioned that it is difficult to ensure good security.

Community-level follow-up and supervision were mentioned as important tools that are used to follow up on irregularities, and to ensure that children receive the amounts that are entered in the consumption books. One UNICEF informant mentioned that clients are required to return to the facilities with the empty bags of RUTF as a way to help minimize leakages.

The Nutrition Cluster informed us that in some provinces, there are government orders prohibiting the sale of RUTF. We were told that work was underway with the MOH to put in place a similar order at the national level. However, the effectiveness of these orders is unclear. One partner told us that attempts had been made to prosecute those found with RUTF but that they were usually “let off without being bothered for long.” We were told by a PRONANUT informant that RUTF could be found in the markets, but it was not clear at what level the deviation was happening—if it was beneficiaries selling it or if it was being taken further up the supply chain.

Low Treatment Coverage and Inadequate Funding

Available funding is not sufficient to provide RUTF to all children who need it regardless of whether RUTF could be efficiently and reliably delivered. A UN-affiliated informant estimated that only about 30 percent of the DRC’s health zones are covered by a “nutritional care package” that ensures a continuum of care not only for severely wasted children but also for moderately wasted children. One key informant stated that UNICEF is underfunded, especially for nutrition, and is ordering only for the projects it has. Another informant mentioned that UNICEF tends to order products based on programmatic needs and that buffer stock is dependent on available resources.

The funding challenge is corroborated by data from the Global Nutrition Cluster (GNC). According to data from the 2022 annual report, of the 781,000 children estimated to be in need of treatment for severe wasting, only 70 percent (549,000) were targeted. Figures for children with moderate wasting

are much lower in terms of the number of children targeted. This is a problem because if moderately wasted children are not treated, they may deteriorate into severe cases. Of the 1.63 million children estimated to need treatment for moderate wasting, only 43 percent (699,000) were targeted. However, it should be acknowledged that although targets were much lower than the number of children in need, 97 percent of targeted children with severe wasting and 90 percent of targeted children with moderate wasting were reached with treatment. Doubtlessly contributing to decisions about targeting is the severe underfunding of the nutrition response in the DRC. Of the \$258.6 million required for the nutrition portion of the HRP, only 35 percent was received (\$89.2 million). These figures represent funding for the entire nutrition response, not just funding required for the provision of RUTF, meaning that funding available for severe wasting treatment represents only a fraction of the \$89.2 million received (GNC/UNICEF 2023).

Currently, we are covering less than 50 percent of the humanitarian needs based on the funding that is available from different donors, because we have USAID, we have ECHO, we have other donors and regular UNICEF resources...Less than 50 percent [of the need] is covered by these inputs that we are making available and the challenges are still enormous for total coverage. Normally, for an improved nutritional response, we need to cover at least 80 percent of the need.

—UN-affiliated key informant

OPPORTUNITIES FOR STRENGTHENING

As part of our discussions with key informants, we asked them to tell us what they would like to see changed in the RUTF supply chain and to identify actions that would help strengthen it.

Involve Government and Facility-Level Staff in Planning

Government informants at all levels, including the DPS, PRONANUT, BCZs, and facility-level staff, overwhelmingly wanted to be more involved in the planning for RUTF procurement and delivery. A range of requests were made related to the planning process, from being involved in the selection of a reliable RUTF supplier to simply being able to place orders that are respected by the partners.

Thirty-two percent of government informants (15/47) mentioned that the partners, inclusive of PRONANUT when PRONANUT is the main supplier, need to improve their systems, better manage and plan their inputs, and ensure that requested amounts and timelines are respected. One implementing partner informant also acknowledged the need to better prepare ahead of the start of new projects by allowing for a lead time of at least 90 days, to ensure that RUTF is available before starting implementation.

Government informants felt that they are important partners to include in the planning process because they have the most accurate data about the needs in their health areas, health zones, and provinces. One government informant pointed out that DHIS-2 data, which partners and the Nutrition Cluster often rely on for planning targets, are not always accurate. Generally, there is a lack of up-to-date nutrition information for the DRC, with prevalence data for some health zones dating back to the 2018 Multiple Indicator Cluster Surveys.

What we would like to see changed is to participate in the planning of the needs and to associate ourselves especially in the supply chain. That's what we wanted to change. Everything that is inputs, the needs should come from us, coordination of PRONANUT. We

are the ones who have a good command of our health zones, we have the data that are reported by the health zones. All the real needs should be expressed by us and shared with the partners. Then we should also have sessions to validate these needs. That could improve the situation.

—Province-level government key informant

Ongoing, intensive coordination across all system levels will be required if ground-up data, based on actual RUTF consumption, are to be readily available for partners and donors to access as early as the project proposal stage. The Nutrition Cluster is already doing some work in this area through its province-level input TWGs. A more systematic approach to involving the Cluster in input tracking could be one way to ensure that these data are available, and to increase involvement in the development of and ownership of the final targets by government and facility staff.

Infrastructure Improvement

Echoing the challenges highlighted earlier, key informants also requested that improvements be made to key infrastructure, including roads, air service availability, and warehouses. In terms of improving the roads—although this would greatly improve the reliability of RUTF supply and ease transportation costs—it was acknowledged that this was not the responsibility of the nutrition sector. Some placed the responsibility on the Congolese government, whereas another informant proposed higher-level advocacy to donors because better roads would lead to improvements across sectors.

There are probably opportunities there, but they are with more important levers, especially at the level of financiers, donors, rather than at the level of implementers. The same plea for infrastructure, but here I think that it is not just a nutrition program, but it can concern all aid to the country. Even the development of the Congolese private sector could only benefit from this kind of thing.

—UN-affiliated key informant

Key informants provided additional justification of the need for improved warehousing infrastructure when making recommendations on this topic. Several informants proposed a shift from monthly provision of RUTF to a quarterly schedule. However, to make this feasible, adequate storage space must be available at the province, health zone, and health area levels. Improved warehousing infrastructure would also make pre-positioning, relay depots, and holding of buffer stock closer to the health areas more feasible.

Both UNICEF and implementing partner key informants expressed a desire to better integrate RUTF in the government warehousing system, preferring for stocks to be held at province and health zone-run warehouses rather than in parallel warehousing systems.

Integration in and Strengthening of Government Supply Chains

As highlighted by a UN-affiliated key informant earlier in the report, the non-integration of RUTF and other nutrition commodities in the supply chain may be part of the reason some of these key infrastructure improvements have not been made. Of the 25 key informants we spoke with at national and provincial levels, which encompassed implementing partner leadership, UN, and government, 7 mentioned a need to move forward with integrating RUTF in existing government systems. It was noted that despite their inclusion in the Essential Medicines List, RUTF and therapeutic milks cannot be found at the Central d'Achat et de Distribution des Médicaments Essentiels Génériques ([CDR]; Central Purchasing and Distribution of Essential and Generic Drugs). However, one partner noted that even if RUTF were available at the CDR, it is not a certified supplier of RUTF and, therefore, it may not be possible to purchase it from the CDR directly, due to donor requirements.

Several suggestions were made as to how RUTF could be better integrated in the CDR. First, a Nutrition Cluster informant proposed that the local supplier of medical inputs for Nord Kivu and the east of the DRC, ASRAMES, could receive funding directly from UNICEF and the World Food Programme to include nutrition commodities in its routine orders. According to key informants, this would ensure a readily available supply in the province, and partners—or even health zones—could purchase directly from ASRAMES. Several health facilities based in Goma mentioned having used ASRAMES to try to order RUTF in the absence of partner support, and Save the Children has also made small orders from it. The main barrier at the moment is limited capacity and timelines because ASRAMES also has to import RUTF. Better funding and planning in collaboration with ASRAMES could alleviate these barriers.

Second, government informants proposed that the DPS should have a larger role in planning for and coordination of RUTF procurement as part of its oversight of the CDR. One informant proposed that UNICEF should fund the DPS directly, and in turn, the DPS could ask the CDR to procure RUTF and make it available in the central stores.

If UNICEF was contracting directly with DPS, we could contract with CDR. All the inputs arrive at the CDR level. From the CDR, as at the level of the Support Office through the medical logistics service, the plans would be defined, validated, [and] we could convey these inputs to the health zones. At that point, a member of PRONANUT could transport, accompany the CDR in the transportation of inputs—but as long as each partner tries to secure itself with these organizations, it is complicated.

—Province-level government key informant

UNICEF informed us that it currently has a project that is part of the World Bank-funded Multi-sectoral Nutrition and Health Project where it is planned to integrate nutritional products in the drug supply chain. The planned approach is to sign contracts directly with the CDR; however, the activities have not yet started due to delays in signing the agreements with the CDR. The pilot will take place in only four provinces. However, this could be work from which to learn and build in the future.

Creation of Common RUTF Stock

Half of our UN-affiliated key informants expressed a need for more flexible RUTF supplies, including buffer stock. As noted earlier, there are restrictions on how inputs purchased by specific donors can be used, limiting the ability of UNICEF to use supplies from one donor to meet unexpected needs in an area supported by another donor.

[One suggestion] we have [is] if we can also have a common basket of stock among the different donors. Because, currently, we work or we operate by project. Once the needs are defined, the needs are still compartmentalized in the specific geographic areas. It is not that 'here, we have 1,000,000 children suffering from malnutrition in the DRC, and all the donors come with their contribution to reach at least 80 percent of these children in the different specific areas.' There has been prior specific targeting of geographic areas with different partners, with very little flexibility to be able to respond to other emergencies, while there may be inputs that are available and buffer stocks that are available for these health areas.

—UN-affiliated key informant

Last, the need for a national strategy with a “truly national coordination targeted at the level of provinces and even critical areas” and strengthening communication with donors was expressed by a UN-affiliated key informant.



A mother feeds her child RUTF at a UNICEF-supported UNTA site in Bandundu in western DRC.

PHOTO CREDIT: GWENN DOUBOURTHOUMIEU

DISCUSSION



PHOTO CREDIT: GWENN DOUBOURTHOUMIEU

A woman receives a ration of RUTF for her child. With continued strengthening of the RUTF supply chain in the DRC, hopefully all women and children will have access to this lifesaving product whenever they need it.

DISCUSSION

Our analysis has detailed the highly variable and unpredictable ways that RUTF makes its way from international producers to health areas in the DRC.

There was quite a bit of variability in the structure of the pipelines in terms of the frequency of delivery, types of transportation used, and the warehousing structure. In many instances there was even variability in the same pipeline, depending on the season or unforeseen circumstances (e.g., insecurity, vehicle breakdowns). It was difficult to draw clear conclusions about which structure performed best. However, we did note that the use of the BCZ warehouse in Cilundu as a holding place for RUTF before its distribution to the health facilities seemed to have benefits not only in terms of reduced stockouts at the facility level but also in terms of positive perceptions of the supply chain performance by government stakeholders.

The previously-mentioned variability in the pipelines and its variation, and in some cases ad hoc nature, made it impossible to do any kind of direct cost comparison among the pipelines. Frequency of delivery and the mode of transportation used were not consistent enough for us to estimate average costs. However, both aspects are important overall cost drivers.

In terms of assessing supply chain performance—although one pipeline, RUTF imported by Save the Children, performed slightly better than the others—all pipelines faced problems with stockouts and low stock levels in their warehouses at the time of our site visits (e.g., having less than one month of stock on hand).

The most common and nearly universal cited challenge to RUTF delivery according to our key informants was transportation. Extremely poor infrastructure makes many areas inaccessible during the rainy season, and a lack of adequate road and air transportation options restrict the frequency of deliveries and the quantities of RUTF that can be delivered. Insecurity in some areas only adds further complexity by necessitating extensive, and sometimes international, detours to safely deliver products. Because transportation is so unpredictable, it was not possible for us to determine specific cost differences among the pipelines. It was also not surprising that several informants highlighted challenges with adequately planning and budgeting for transportation under these circumstances.

Although this work looked at only four RUTF pipelines and covered a small number of health zones and health areas, the challenges we identified are similar to those noted in other RUTF-related reviews. An RUTF scoping study completed in

2020 found that barriers to scale-up of treatment of severe wasting with RUTF are its cost, availability, and regular supply (Mates and Sadler 2020). The scoping study also noted that there is stakeholder consensus around the need for better reporting and analysis of RUTF pipeline breaks. It also found that short-term humanitarian financing for RUTF supplies is what “adds complexity to ensuring continuous supply,” which our analysis corroborates as true in the DRC.

The 2020 scoping study also found limitations with national supply chains that can hinder RUTF delivery. The study noted that RUTF is a “bulky” product, posing challenges to existing health infrastructure to transport and store appropriately (Mates and Sadler 2020).

Another recent effort to understand RUTF access posits that the biggest barrier to RUTF access is financing. It is estimated that current financing for RUTF covers, at most, 25 percent of global need (R4D 2021). This work also notes that most funding for RUTF comes from humanitarian sources despite the higher wasting burdens in non-humanitarian settings and calls for increased financing from all sources and better national-level coordination on nutrition budgets. This is similar to the requests we heard from some key informants to better coordinate and even pool resources for RUTF to ensure that all areas have access to available supplies, especially in cases of unforeseen emergencies or stockouts.

Somewhat surprisingly, local production of RUTF was not mentioned by stakeholders in the DRC as a potential solution to the country’s supply chain issues, although small amounts of RUTF (approximately 1,000 cartons per month) were produced by a UNICEF-certified local firm in Lubumbashi as part of the Nutriset PlumpyField network (Mathys and Remancus 2010; Troubé 2012). It is unclear when or why these operations ceased. Global opinion is somewhat divided on the option of local production, with the UNICEF Supply Division investing heavily in the diversification of its RUTF suppliers. Information from April 2019 shows that UNICEF procured 59 percent of RUTF from “programmatically countries”: countries in which the RUTF is produced and also used (UNICEF 2019). However, locally produced RUTF is often more expensive due to the need to import certain raw materials for production. Yet the argument is often made that a locally produced supply of RUTF could promote more sustainable access and has other advantages, including a lower environmental impact (Mates and Sadler 2020). However, other analyses point out that purported environmental benefits are negated when key inputs still require importation, and that decisions about RUTF suppliers should be based on the best combination of price, performance, and supply security (R4D 2021). These are all important factors for

partners that are importing RUTF into the DRC to deliberate, especially when considering options for a more coordinated plan for RUTF procurement.

RECOMMENDATIONS

The challenges facing the RUTF supply chain in the DRC are complex and cannot be solved by the nutrition sector alone. However, several opportunities highlighted by our key informants are manageable in the nutrition sector and merit further follow-up and consideration by nutrition stakeholders in the DRC, inclusive of donors, government, UN agencies, and implementing partners.

- **Assess the national supply chain’s readiness to integrate RUTF.** RUTF has been included on the DRC’s Essential Medicines List, which is an important first step in the integration process. However, as noted earlier, it is rare to find RUTF in national medical stores, such as the CDR. Learning from UNICEF’s four-province pilot of RUTF integration will be important to build from when determining what actions are necessary to make integration of RUTF in national systems feasible. Warehousing infrastructure will be a key consideration as will accountability mechanisms to minimize leakages. Government warehousing infrastructure at the province and health zone levels is currently inadequate in terms of the storage capacity required to hold the amount of RUTF needed to treat the number of wasted children. It will also be important to thoroughly assess which entry points for integration are the most suitable, such as working through the DPS, and with the CDR or ASRAMES, and considering trade-offs among integration, collaboration, efficiency, and value for money. As highlighted in a series of UNICEF case studies on integrating nutrition products in health system supply chains, the integration of RUTF in national supply chains often requires health systems strengthening before it can be realized—a key consideration before embarking on this task in a challenging context like the DRC (Sorensen, Codjia, Hoorelbeke, Vreeke, and Jille-Traas 2016).
- **Expand the role of the Nutrition Cluster in supply chain management.** The Nutrition Cluster has put in place some mechanisms to try to monitor and coordinate RUTF stock in the country, including its national-level analysis efforts and province-level TWGs. However, information is not shared systematically by all partners, thus limiting the usefulness and robustness of these efforts. Nutrition stakeholders should consider formalizing and strengthening the Nutrition Cluster’s role in the supply chain. One important action could be adding more formal,

standardized RUTF reporting alongside other routine wasting reporting data that humanitarian partners already supply to the Nutrition Cluster on a routine basis. The Nutrition Cluster could also play an important advocacy role to highlight infrastructure challenges (e.g., roads and warehousing) that are beyond the ability of nutrition stakeholders to fix directly.

- **Review targeting criteria and supply estimation formulas.** Underestimation of needs originating at the proposal, procurement, and contracting process stages are contributing to RUTF supply shortages at the health facilities. According to the information shared by key informants, it seems that additional stock to cover population movements, relapse, and unforeseen shocks needs to be better accounted for in supply and buffer stock estimation formulas. Estimates are often made using outdated prevalence data due to a general lack of updated nutrition data in the DRC. Additional estimation assumptions, such as the incidence correction factor, which is an assumption of illness duration for severe wasting cases used to estimate caseloads, should be reviewed. For the 2022 HRP estimates, an incidence factor of 2.8 was used to account for a slight increase in expected cases due to COVID-19 (the standard incidence rate is 2.6). However, research conducted by Harvard in the DRC suggests that the correction factor should be as high as 5 (Maximising the Quality of Scaling Up Nutrition Plus 2020). If this is true, then caseloads are being underestimated, which will only further exacerbate supply shortages. In addition, several informants mentioned that overall supply decisions are made at the central level based on rates of consumption at lower levels. Given the high prevalence of stockouts, attempting to use consumption to measure future needs is difficult because consumption would likely be much higher if the system were able to keep the lower levels well stocked with RUTF. In that context, using actual consumption data to predict future needs can perpetuate both stockouts and the attendant underreporting of needs. Involvement of government officials in targeting and RUTF planning processes could be a way to improve these figures and take a step toward more government ownership of the RUTF supply chain at the same time
- **Strengthen donor coordination around financing for and provision of RUTF.** UNICEF is not receiving adequate funding to fully address RUTF needs in the DRC. However, other donors, with BHA and the World Bank being two cited examples, are financing the procurement of

RUTF in other ways. NGOs are also purchasing RUTF with their own organizational funding. Although some level of duplication in the supply chain can be useful to help backstop breakdowns in different parts of the system, it can also lead to unintentional gaps in coverage and a lack of flexibility in the use of stocks at the national level. Better coordination and, ideally, even some level of collaboration among donors, implementing partners, and the government, are needed to ensure that the system for the provision of RUTF is set up in a way that is transparent, responsive, and equitable.

- **Continue efforts to alleviate RUTF importation barriers.** Last, because it is not feasible, nor necessarily desirable, for UNICEF to be the sole importer of RUTF for the DRC, the playing field needs to be leveled for other actors who are importing RUTF into the country. Although a system to ensure that only safe, quality products are allowed to be distributed to children must be in place, the system needs to be streamlined to reduce delays in these processes. Advocacy on the part of the Nutrition Cluster should be bolstered by support from donors to ask the government to either revise its systems or expedite exemptions for partners who are importing this lifesaving product.

CONCLUSIONS

RUTF shortages and stockouts are by no means a problem exclusive to the DRC, and much work has been done at the global level to understand how best to address this challenge. This study was able to identify common challenges across pipelines, such as poor road and warehousing infrastructure, which hinder the timely, reliable, and adequate deliveries of RUTF to health facilities. However, because these challenges mean that delivery frequency, transportation modes, and delivery amounts are inconsistent, the cost of RUTF transportation could not be compared among the pipelines. All pipelines had performance challenges, with more than two-thirds of the facilities having records showing a stockout in the past six months and nearly all facilities having less than one month's supply on hand at the time of our visit. Given the variability in contexts, even in an individual province, it is difficult to say for certain if the structures of the pipelines or the contexts in which the pipelines are operating had more of an impact on overall performance. Ongoing investigation into the identified issues is needed to inform the implementation of the recommendations for strengthening RUTF delivery in the DRC. We hope that by detailing some of the on-the-ground examples in the DRC, this report can contribute to both global thinking and in-country action on practical solutions and best practices.

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ANNEX I. VISITED SITES

Province	Health Zone		Health Area	Service Delivery Point Type and Distance
Kasaï Oriental	Cilundu	Setting: Rural Nutrition Cluster Prioritization: Medium Modality: NGO Procurement Partner: Save the Children	Bashingala	UNTA km from BCZ: 18
			Luanga	UNTAkm from BCZ: 13
			Cijiba	UNTAkm from BCZ: 42
			Cilundu	UNTIkm from BCZ: 2
			Bakua Nsumba	UNTAkm from BCZ: 50
	Dibindi	Setting: Urban Nutrition Cluster Prioritization: Low Modality: PCA Partner: SDC	Centre Hospitalier Presbyterian de Mbuji-Mayi	UNTI/UNTAkm from BCZ: 0
			Merveille	UNTAkm from BCZ: 9
			Centre de Santé Presbytérien au Congo de Kasavubu	UNTAkm from BCZ: 7
			Bupole	UNTAkm from BCZ: 7
			Reference	UNTAkm from BCZ: 3
	Kasansa	Setting: RuralNutrition Cluster Prioritization: Medium Modality: NGO Procurement Partner: Save the Children	Kasansa	UNTI/UNTAkm from BCZ: 23
			Lac lomba	UNTAkm from BCZ: 10
			Nutrition Cluster	UNTAkm from BCZ: 17
			Prioritization: Medium	UNTAkm from BCZ: 2
			Lukalaba Est	UNTAkm from BCZ: 3

Province	Health Zone		Health Area	Service Delivery Point Type and Distance
Nord Kivu	Kibua	Setting: Rural Nutrition Cluster Prioritization: Medium Modality: NGO Procurement Partner: PUI	Matchumbi	UNTIkm from BCZ: 46
			Lubonga	UNTAkm from BCZ: 12
			Kishanga	UNTAkm from BCZ: 17
			Karambi	UNTAkm from BCZ: 25
	Goma	Setting: Urban Nutrition Cluster Prioritization: Medium Modality/Partner: None—ad hoc supply	Centre Chrétien du Lac Kivu	UNTAkm from BCZ: 5
			CARMEL	UNTAkm from BCZ: 3
			Heal Africa Hospital	UNTI/UNTAkm from BCZ: 2
	Walikale	Setting: Rural Nutrition Cluster Prioritization: High Modality: PRODOC Partner: PRONANUT	Bilobilo	UNTIkm from BCZ: 30
			Sacré Coeur	UNTAkm from BCZ: 1
			8ème Communauté des Eglises de pentecôte en Afrique Centrale	UNTAkm from BCZ: 1
			Ndjingala	UNTAkm from BCZ: 45
			Biruwe	UNTAkm from BCZ: 73



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