SAVING LIVES
CHANGING LIVES

Photo credit: WFP/Rein Skullerud

Fill the Nutrient Gap
Rwanda

REFUGEE REPORT

WFP
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List of Acronyms

CotD	Cost of the Diet
FAO	Food and Agriculture Organization
FNG	Fill the Nutrient Gap
GAM	Global Acute Malnutrition
IFA	Iron Folic Acid
IYCF	Infant and Young Child Feeding
JAM	Joint Assessment Mission
LP	Linear Programming
MAD	Minimum Acceptable Diet
MCHN	Maternal and Child Health and Nutrition
MMT	Multiple Micronutrient Tablet
MNP	Multiple Micronutrient Powders
NGO	Non-Government Organisation
NISR	National Institute of Statistics Rwanda
PDM	Post-Distribution Monitoring
PLW	Pregnant and Lactating Women
RWF	Rwandan Francs
SENS	Standardised Expanded Nutrition Survey
UN	United Nations
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
WHO	World Health Organization
WFP	World Food Programme

Introduction

Political and ethnic conflicts in the Great Lakes Region[1], coupled with a favourable refugee policy, have given rise to the refugee situation in Rwanda. Rwanda's favourable policy allows refugees to work, move freely within the country, establish companies, pay taxes and create jobs. Despite this, refugees face significant challenges in accessing livelihoods and income-generating opportunities, resulting in an excessive reliance on WFP and UNHCR (United Nations High Commissioner for Refugees) assistance to meet food and non-food needs.

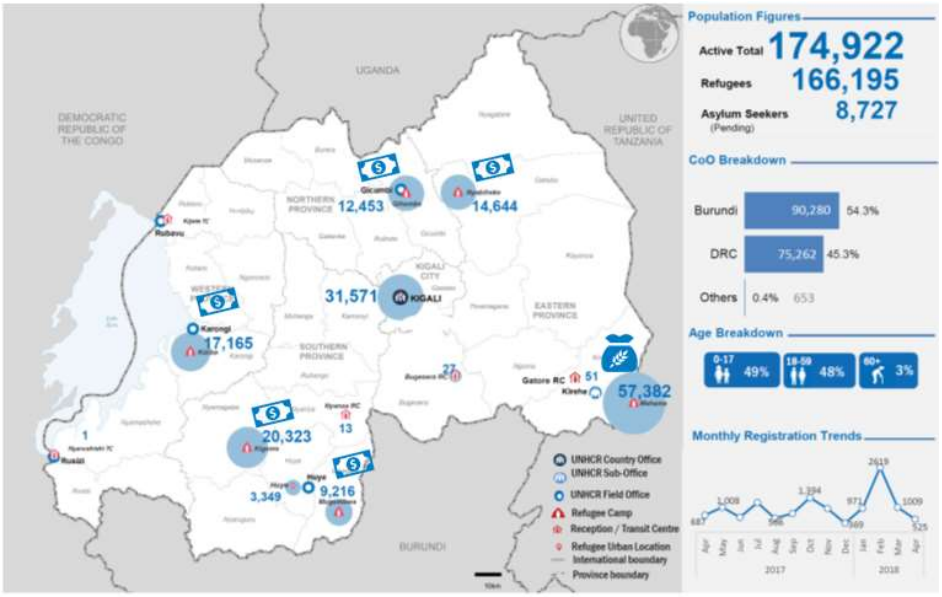
By the end of 2017 Rwanda hosted almost 175,000 refugees within their 11 million population, 79 percent of whom now reside in six camps provided by the government of Rwanda, while the remainder reside in Kigali and are classified as urban refugees. Congolese refugees have been fleeing to Rwanda since 1996 and constitute 78,750 people or 45 percent of the refugee population, residing in the original five camps in the north, east, south and western areas of the country (Gihembe, Nyabiheke, Kiziba, Kigeme and Mugombwa[2]). These camps receive monthly unrestricted cash from the World Food Programme (WFP) to buy food (United Nations High Comission for Refugees, World Food Programme, and United Nations Children's Fund 2018).

The refugee population in Rwanda increased significantly from 2015 following election-related conflicts in Burundi. This influx necessitated opening a sixth camp, Mahama in Kirehe district. Mahama is now Rwanda's largest refugee camp, currently home to over 57,382 Burundian refugees or 34 percent of the refugee population in Rwanda as of 2018. The WFP provides monthly food rations to this camp but aims to change to cash-based transfers following an upcoming feasibility study. Refugees from Burundi continue to flow into Rwanda at a rate of 40–80 people per month and this flow is not expected to slow down in the near future. Forty nine percent of the refugees in Rwanda are under the age of 18 while 15 percent are under the age of 5 (United Nations High Comission for Refugees, World Food Programme, and United Nations Children's Fund 2018).

The location and size of the refugee camps as well as the WFP assistance modalities used is shown in Figure 1.

[1] This region comprises the following countries that surround the *African Great Lakes:* Burundi, the Democratic Republic of the Congo, Kenya, Rwanda, Tanzania and Uganda.
[2] Established in 1997, 2005, 1996, 2012 and 2014 respectively.

Figure 1. Location, size and WFP assistance modalities used in the Rwandan refugee camps (United Nations High Comission for Refugees, World Food Programme, and United Nations Children's Fund 2018).



Chronic malnutrition is widespread across the camps and improvements in stunting and anaemia have been inconsistent over the past six years (United Nations High Comission for Refugees, World Food Programme, and United Nations Children's Fund 2012; 2013; 2014; 2015; 2016; 2017; 2018). Addressing malnutrition in refugee camps in a sustainable manner requires taking a gender-sensitive lifecycle approach that engages both men and women, with a special focus on the most nutritionally vulnerable: children under 2 years of age, adolescent girls, and pregnant and lactating women (PLW). It must include a range of context-specific, targeted interventions that engage stakeholders across multiple sectors.

Malnutrition has two direct causes: inadequate nutrient intake and disease. As its name specifies, the Fill the Nutrient Gap (FNG) assessment focuses on gaps in nutrient intake to inform a country's national policies and actions that can be taken to improve nutrition among their population, with a focus on the most vulnerable (Bose et al. 2019). The FNG assesses the extent to which people have choices. It considers the availability, physical access and affordability of nutritious foods required for adequate nutrient intake. It seeks to understand why people make the food choices they do. Finally, it identifies context-appropriate interventions that can be implemented by different sectors to enable people to choose more nutritious foods, and hence fill nutrient gaps.

The assessment comprises two components:

- A country-specific review of secondary data and information on factors that reflect or affect dietary intake. This includes malnutrition trends over time, characteristics of the food system and food environment, and population behaviour related to food and feeding.
- An assessment of the extent to which economic barriers prevent adequate nutrient intake. This uses the Cost of the Diet (CotD) linear programming software developed by Save the Children (UK), and includes modelling of the economic impact of possible interventions to increase nutrient intake and fill nutrient gaps.

Malnutrition cannot be addressed by one sector alone. FNG is designed to inform multisectoral decision-making and therefore engages stakeholders from all sectors including food, health, agriculture, education, and social protection systems throughout the assessment.

It is the stakeholders who define the scope and focus of the assessment. They contribute data and sources of information for identification of context-specific barriers and entry points and develop a shared understanding of the issues and possible solutions. They then identify appropriate nutrition-specific and nutrition-sensitive interventions that can be implemented by different sectors using their existing delivery platforms. These could be social safety nets, food processing and markets, antenatal care, school feeding programmes and others.

The FNG assessment has been developed by the WFP with technical support from: The University of California Davis; the International Food Policy Research Institute (IFPRI, Washington DC); Epicentre (Paris); Harvard University (Boston); Mahidol University (Bangkok); Save the Children (UK); and UNICEF. At the end of 2018, the FNG had been conducted in 17 countries and started in another 8.

The overarching objective of the Fill the Nutrient Gap (FNG) in Rwanda was to bring stakeholders together to identify and prioritize context-specific policies and programmes across food, health and social protection systems and other relevant sectors with the aim of improving nutrient intakes of target groups. The results from the FNG at national level are to be used to inform and complement the new National Nutrition Policy, among other evidence-based strategic documents. The FNG team in the WFP country office identified a need for an additional FNG analysis that would be used to inform WFP and stakeholder programmes in refugee camps, the results of which are described in this report.

Method

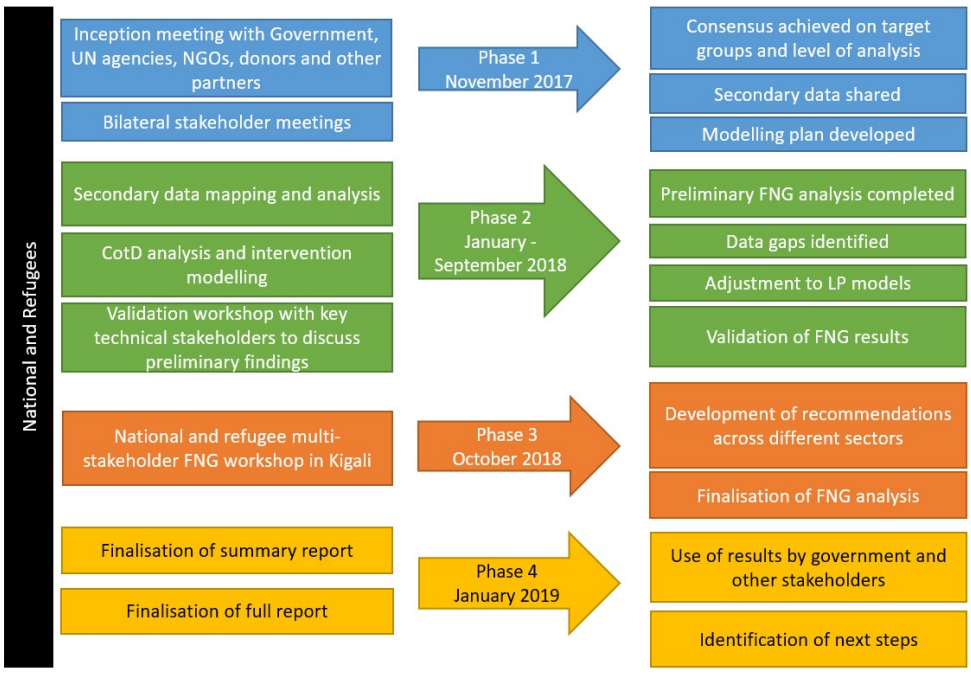
Refugee FNG Process in Rwanda

The FNG process for the refugee camps ran from November 2017 to October 2018. The analysis comprised a comprehensive literature review of available secondary data sources in combination with linear programming (LP) using the Cost of the Diet (CotD) software. The aim was to understand context-specific barriers to adequate nutrient intake and to model potential interventions to improve access to nutrients, particularly from nutritious foods that can fill the existing gap.

For the refugee analysis, the Rwanda FNG team was formed of UNHCR, the WFP country office, regional bureau and Rome headquarters. At the start of the process the team met with Non-Government Organisations (NGOs) working in the camps to: introduce the FNG process; collate secondary data sources, and; identify possible interventions, entry points and transfer modalities to test in the CotD modelling. Forty data sources were identified and reviewed and the LP analysis intervention modelling was carried out. Full findings were presented internally to all units, first within the WFP country office working in the refugee camps and then to UNHCR and the wider stakeholder group as part of a recommendations workshop.

A full list of the stakeholders who were engaged throughout the FNG process can be found in Annex 1. The detailed FNG process in Rwanda is illustrated in Figure 2.

Figure 2. The FNG process followed in Rwanda.



Collation and Analysis of Secondary Data

The FNG framework for analysis depicted in Figure 3 helps to consolidate and analyse existing secondary data at country level based on the following categories:

Malnutrition Characteristics: review prevalence data of malnutrition characteristics (Stunting, Wasting, Anaemia, Underweight, Overweight) and if possible data on certain Micronutrient Deficiencies. If relevant, seasonal patterns of various nutritional problems within populations can be considered. Malnutrition characteristics are reviewed in the initial stage to define priority groups for the analysis.

Enabling Policy Environment: analyse if the policy environment adequately facilitates access and availability of nutritious foods for the population by identifying possible gaps in national policy, and national legal or regulatory frameworks related to access and availability. Enforcement of these policies and regulations is a key part of the analysis; for example, while there may be a mandatory national fortification policy, compliance of this policy may be low in reality. This section is crucial in identifying current or potential entry points for nutrition interventions.

Availability of Nutritious Foods: review information on local availability of nutritious foods (natural and fortified) as well as on local production and processing capacity to assess whether it would be possible to meet nutrient needs from locally available foods.

Access to Nutritious Foods: determine if the target populations have access to nutritious foods in both lean and non-lean seasons, in urban vs rural areas etc. Also gain a better understanding of the adequacy of nutrient intake at the household level and the ability of households to cope with potential shocks.

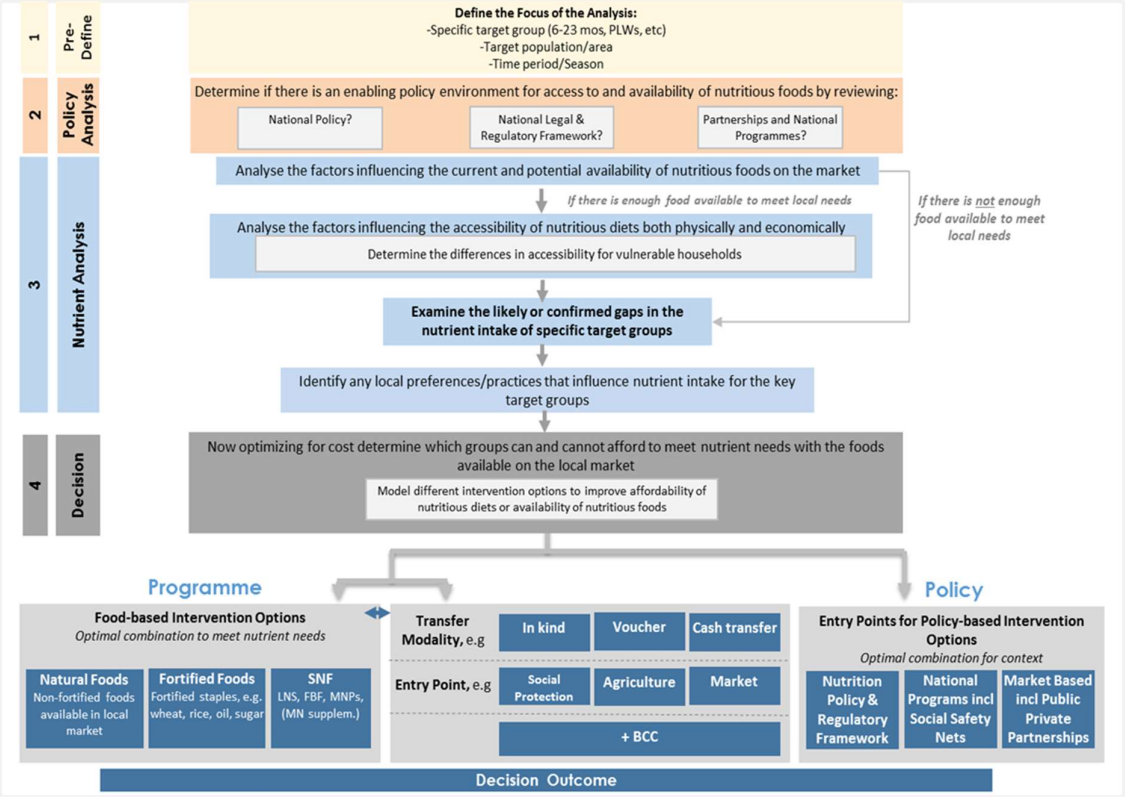
Nutrient Intake: examine likely or confirmed gaps in nutrient intake at the individual/target group level, in particular related to Infant and Young Child Feeding (IYCF) practices and the coverage of supplementation and/or fortification programmes. Each age group has different nutrient requirements (e.g. a 6-11 month old child requires complementary foods, in addition to breastmilk, with much higher nutrient density, such as more mg of iron and zinc per 100 kcal, than an adult male).

Local Practices: identify socioeconomic and cultural factors influencing food purchasing patterns and feeding practices that currently act as a barrier to adequate nutrient intake or could in the future limit the effectiveness of certain food-based interventions, particularly among target groups of interest. Information gathered with tools such as ProPAN can be very useful to gain insights into local preferences and behaviours, which can inform strategies such as Social and Behaviour Change Communication (SBCC) to

improve feeding practices. Focus Ethnographic Studies or Focus Group Discussions carried out by local academia or NGOs can provide key insights into this often overlooked area of analysis.

Cost Optimization: by utilising the CotD, the minimum cost of a locally available nutritious diet was estimated. An insight was also gained into what proportion of the population can afford the diet in different geographic areas or among social safety net beneficiaries compared to non-beneficiaries. The tool was also used to model possible intervention options that might improve affordability, such as introduction of fortified foods and/or Specialised Nutritious Foods (SNFs) through market channels or social protection programmes, and cash transfers.

Figure 3. FNG Framework for situation analysis and decision making.



Between November 2017 and August 2018, the secondary data analysis was carried out by the FNG team. A data mapping template was developed to assist the identification and review of different information sources relevant to the FNG analysis and to highlight areas where data had not been found. Data sources were identified, mapped and reviewed over three main stages:

1. Consultation with refugee stakeholders: Prior to and during the November mission to Rwanda, information about the data requirements for the FNG analysis and the FNG data mapping template were shared with the WFP country office and refugee stakeholders, who, in turn, shared relevant datasets, reports and articles with the FNG team.

2. Literature search: In addition to obtaining data through national stakeholders, a web-based literature search was carried out to identify any further articles or reports relevant to the FNG analysis and to provide a contextual overview of the nutrition situation of refugees in Rwanda. PubMed and Google Scholar were used to search for data from studies in academic journals, institutional reports, and working paper series published in the last 10 years.

3. Follow up on identified data gaps: Once the data mapping spreadsheet had been populated with information sources from stakeholders and the literature review, data gaps, in terms of themes, areas of the country or population groups, could be identified. The FNG team then shared this list during the multi-stakeholder preliminary findings presentation to inquire whether any additional information sources could be shared. A further, targeted literature search focussing on these specific gaps was also conducted.

Through consultation with refugee stakeholders and a review of relevant literature, 40 data sources were identified and reviewed. This review identified a number of data gaps that could not be filled, as detailed in the 'Data Gaps' section.

Cost of the Diet Assessment

The CotD software uses linear programming to understand the extent to which poverty, food availability and prices may affect the ability of people to meet their nutrient needs (Deptford et al. 2017). Using price data collected from markets or from secondary sources, the software calculates the amount and combination of local foods that are needed to provide individuals or households with their average needs for energy and their recommended intakes of protein, fat and micronutrients[3] at the lowest possible cost. These diets are calculated within defined constraints to prevent the inclusion of unrealistic types or amounts of food and the provision of excessive amounts of nutrients.

For the refugee analysis, the CotD analysis and intervention modelling was undertaken in each of the six camps: Gihembe, Nyabiheke, Kiziba, Kigeme, Mugombwa and Mahama.

[3] As defined by the Food and Agriculture Organization (FAO) and the World Health Organization (WHO). The need for 9 vitamins and 4 minerals is included.

Food Price Data

For the refugee analysis, primary market survey data was collected during the November round of the Post Distribution Monitoring (PDM) to determine the price per 100g of food in each market within the camp. Refugees also purchase foods from markets outside of the camps, but these were not considered for this analysis.[4]

Prior to collecting price data, a comprehensive list of all food items available in the markets was developed. This was followed by a field trial (data not included) where the enumerators practiced data collection methods whilst adding items to the food list. The resulting comprehensive food list was then used to collect data on price and weight in the main market inside the camps.

To collect the information needed to estimate the cost of the diet, market traders were asked the price of the smallest unit of each food item that they sold, assuming that the poor were likely to be able to afford this amount. The poor typically buy foods in small amounts as they cannot afford bulk purchases. Three samples of each food were weighed using electronic scales that had a precision of 1 g. This information was entered into paper questionnaires. These data were entered into the CotD software, which calculated the cost per 100g for each food item in each camp.

Household Size and Composition

A household size of 5 was used for the CotD analysis. The household composition used was based upon the target groups for the FNG analysis as identified by key stakeholders. The household included a breastfed child 12-23 months of age, a lactating woman and an adolescent girl (14-15 years old) – the three primary target groups impacting the critical window of the first 1000 days of life – as well as a child 6-7 years of age and an adult man. For this analysis the 12-23 month old child is to be used as a proxy for children 6-23 months, the child 6-7 years as a proxy for a school aged child and the lactating woman as a proxy for a pregnant and a lactating woman (PLW).

Staple – Adjusted Nutritious Diet

The FNG approach defines the Staple Adjusted Nutritious Diet: the lowest cost diet that meets recommended intakes for energy, protein, fat and 13 micronutrients, with inclusion of the main staple foods and any very common food prohibitions. Staple foods are defined as foods that are generally eaten every day by all household members. 'Prohibited' foods are defined as foods which are not consumed for cultural or religious reasons but not due to not liking them. This diet is not intended to reflect what individuals

[4] Because there were no adequate secondary sources of price data for those markets outside of the camps and it was not possible to extend the data collection to more markets.

or households are currently eating, nor should it be used to develop food-based recommendations or dietary guidelines.

For the refugee analysis, the staple preferences were determined by UNCHR and agreed by the wider stakeholder group. Table 1 summarises the staples chosen for each camp. Beans were included in all camps in combination with rice or maize. A minimum of two portions of the staple foods were included for all household members per day, except for the child aged 12–23 months, who received a minimum of one portion a day. No food prohibitions were identified and thus, no foods were excluded from the analysis. The nutritious diet was the diet that included those staples and other foods that together meet the nutrient needs.

Table 1. The staple preferences used to calculate the nutritious diet for the national FNG analysis.

	Camps					
	Gihembe	Nyabiheke	Kigeme	Mugombwa	Kiziba	Mahama
Rice	X	X	X	X	X	
Maize						X
Beans	X	X	X	X	X	X

Affordability analysis

The cost of the nutritious diet becomes a more meaningful figure when compared with the money that households spend on food. This facilitates an understanding of what percentage of households within the population can or cannot afford the nutritious diet. However, affordability was not estimated for the refugee analysis since this population rely on WFP food or cash assistance as their source of income to meet the majority of their needs (see the Economic Access section). The current cash or food baskets were therefore compared with the cost of the energy only and nutritious diets to better understand to what extend these transfers enable refugee households to consume a nutritious diet.

Intervention Modelling

To reduce the cost of the nutritious diet, a number of interventions were modelled targeting the key vulnerable groups: children aged 6-23 months, adolescent girls and PLW. Interventions were also modelled targeting school aged children and the household overall. These interventions were identified primarily through consultations with refugee stakeholders as well as from the analysis of the secondary data and were modelled in the six camps. The models included:

- Improving access to local nutritious foods through kitchen gardens and smallholder livestock interventions.
- Fortification and biofortification of staple foods.
- Improving access to Specialised Nutritious Foods for specific target groups.
- Micronutrient supplementation.
- Adequate cash transfer values or in-kind food assistance for refugee households targeted through WFP assistance programmes.

The modelled interventions were theoretical and would need to be accompanied by complementary behaviour change interventions to stimulate nutritious choices. The modelling plan for the refugee analyses can be found in Annex 2. The nutrient composition per 100g for the specialised nutritious foods, blended flours, nutritional supplements, fortified and biofortified foods modelled can be found in Annex 3. The underlying assumptions made for all models can be found in Annex 4.

Key Findings

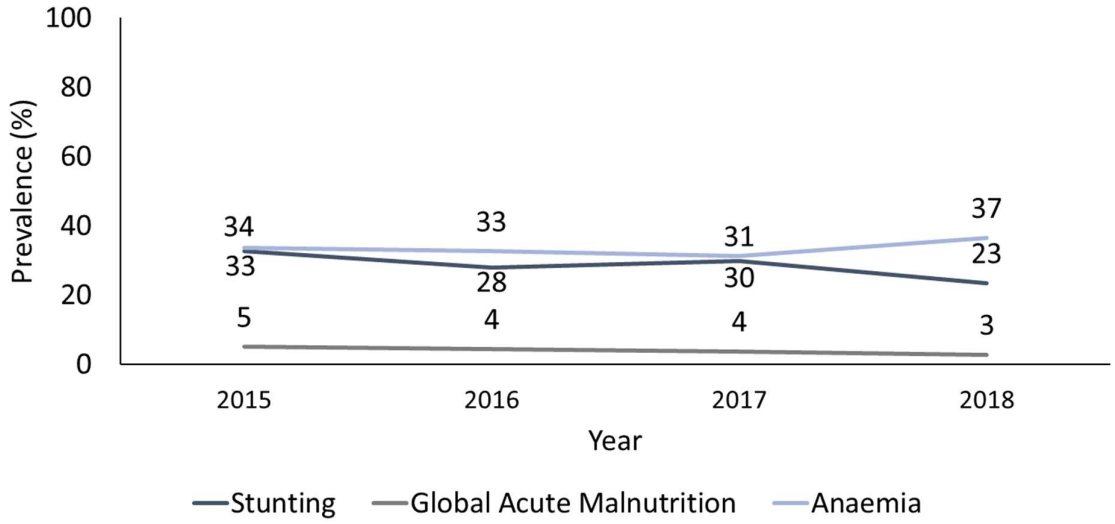
Malnutrition Characteristics

1. Progress in reducing undernutrition in children under 5 years has been inconsistent. Global acute malnutrition (GAM) rates are acceptable but stunting and anaemia are the main burden and rates remain moderate to high. Global acute malnutrition and anaemia prevalence are similar between the host population and refugees while stunting is much lower in refugee camps. Mahama and Kigeme have the worst nutrition situation.

Figure 4 shows that since 2015 the rates of GAM in refugee camps have reduced to an acceptable level of 3 percent. Stunting and anaemia among underfives are of moderate to high public health significance though and their rates have fluctuated between 2015 and 2018. For example: anaemia prevalence decreased from 34 percent to 31 percent between 2015 and 2017 but rose again to 37 percent in 2018. Overall stunting has fallen 10 percent from 33 percent in 2015 to 23 percent in 2018. However, during 2016 and 2017 stunting was still close to 30 percent (United Nations High Comission for Refugees, World Food Programme, and United Nations Children's Fund 2015; 2016; 2017; 2018). Despite the overall positive trend in the reduction of malnutrition, more than half of children (53 percent) under 5 years are affected by at least one form of malnutrition[5], whilst 14 percent are affected by two or more forms of malnutrition (United Nations High Comission for Refugees, World Food Programme, and United Nations Children's Fund 2018).

[5] Wasting, stunting or anaemia.

Figure 4. The prevalence of stunting, GAM and anemia in children under 5 years (6-59 months) from 2015 to 2018 (United Nations High Comission for Refugees, World Food Programme, and United Nations Children's Fund 2015; 2016, 2017; 2018).



Figures 5–7 show the prevalence of stunting (2018), GAM (2018) and anaemia (2015[6]) for children under 5 years of age in the camps and the host population in the refugee hosting areas. The difference between GAM in the refugee and the host populations is minimal. In all camps except Mahama, anaemia was lower than among the host population, but when aggregated[7] this difference is minimal (33 percent in the camps vs. 37 percent in the host population). However, average stunting prevalence in refugee camps is 14 percentage points lower than the national prevalence of stunting in Rwanda (23 percent vs. 37 percent) (United Nations High Comission for Refugees, World Food Programme, and United Nations Children's Fund 2015b, 2015a; National Institute of Statistics of Rwanda, Ministry of Health, and ICF International 2015; United Nations World Food Programme, National Institute of Statistics of Rwanda, and Ministry of Agriculture and Animal Resources 2018; United Nations High Comission for Refugees, World Food Programme, and United Nations Children's Fund 2018). This could be because the refugee camps are a controlled setting that allow for 1) high coverage of nutrition specific and sensitive interventions, 2) implementing partners with higher staffing levels and, 3) increased complementarity across sectors. Much could be learnt from the refugee settings and applied at scale to the host communities to decrease the rates of stunting.

[6] Comparisons for 2018 were not possible because anaemia data in the host population is not available.
[7] Using a simple average.

Mahama[8] and Kigeme camps have the worst nutrition situation of the six camps. Stunting prevalence is 30 percent in both camps whilst GAM is 4 percent in Kigeme and anaemia is 45 percent in Mahama. Anaemia seems to be a persisting problem and since 2015, has risen in all but two of the camps and by as much as 14 percentage points in Nyabikeke camp (United Nations High Comission for Refugees, World Food Programme, and United Nations Children's Fund 2015b, 2015a, 2018). The 2018 Standardized Expanded Nutrition Survey (SENS) identified the following factors related to malnutrition, which will be further explored in this report:

- Infant and Young Child Feeding Practices (IYCF)
- Maternal nutrition
- Attendance of Maternal, Child Health and Nutrition (MCHN) programme and ration use
- Dietary diversity[9]

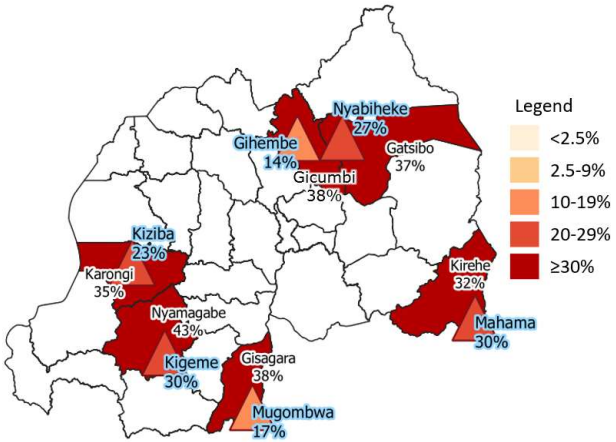
The survey also mentioned family planning, infections and malaria as potential factors but these are outside of the scope of the FNG analysis.

[8] Mahama is also the youngest camp which may explain why nutrition indicators are worse.

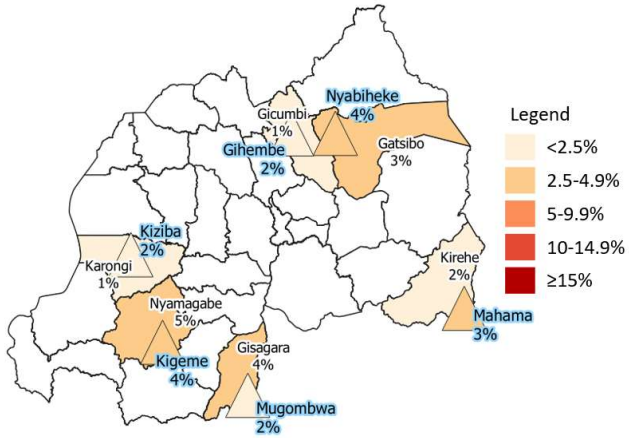
[9] It might be possible that the differences in the nutrition indicators in the camps are explained by the differences between the Burundi and Congolese populations (i.e. genetic differences in height) but this has not been explored in the secondary literature.

Figure 5 to 7. The prevalence of stunting, GAM and anaemia for children under 5 years of age in the refugee camps and host population. Stunting and GAM prevalence is based upon 2018 data whilst anaemia is based upon 2015 data. Triangle indicates refugee camps (Refugee: United Nations High Comission for Refugees, World Food Programme, and United Nations Children's Fund 2015b, 2015a; United Nations High Comission for Refugees, World Food Programme, and United Nations Children's Fund 2018); (Host: National Institute of Statistics of Rwanda, Ministry of Health, and ICF International 2015; United Nations World Food Programme, National Institute of Statistics of Rwanda, and Ministry of Agriculture and Animal Resources 2018).

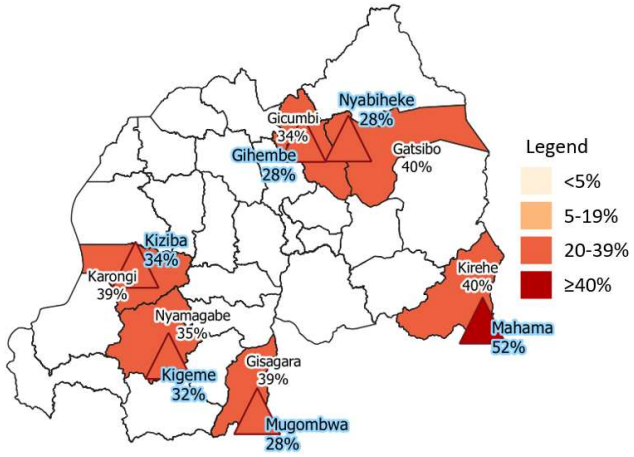
Stunting



GAM



Anaemia



Household Food Security

2. Refugees are almost solely reliant on WFP for food assistance. Due to a scarcity of livelihood opportunities food and cash assistance is being compromised to also cover non-food needs, negatively impacting nutrition and food security.

Food Access and Income Earning Opportunities

At the time of the analysis WFP provided the following commodities as in-kind food assistance to Mahama camp: maize grain, beans, SuperCereal, vitamin A fortified oil and iodised salt. In the Congolese camps, a household of five people received 1,250 RWF per day[10]. According to the 2017 Joint Assessment Mission (JAM) survey and November PDM survey, refugees rely on WFP for 90 percent of their food source (United Nations High Comission for Refugees and World Food Programme 2017; World Food Programme 2017). This is slightly higher in the Congolese camps receiving cash (92 percent of food sources) than in Mahama camp which receives food (87 percent of food sources). The remaining 8-13 percent is met by hunting, fishing, petty trade, own production, casual labor, gifts and borrowing (United Nations High Comission for Refugees and World Food Programme 2017; World Food Programme 2017).

The level of household dependence on WFP is influenced by their opportunities for income generation, which includes having access to land with good quality soil to grow food to sell or having employable skills for the labour market and the need for those skills. The proximity of the camps to food markets and the age and physical capacity of the refugees are also important factors in the level of household dependence on WFP. The JAM survey found no correlation between length of stay in the camps and a refugee's capacity for self-sufficiency (United Nations High Comission for Refugees and World Food Programme 2017).

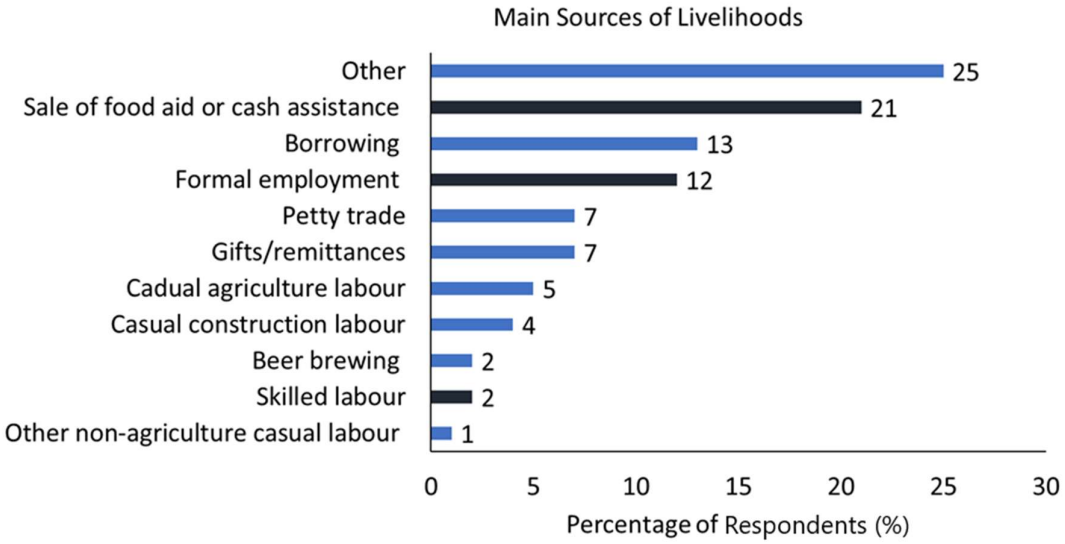
Limited livelihood opportunities, make it difficult for refugees to engage in employment and earn money to support themselves and their families. These issues extend to refugee youth who finish school and face very limited job prospects. Almost half (49%) of all refugees in the camps are under the age of 18, many of whom have received all their schooling in the camps. The lack of employment, vocational and social opportunities results in idleness and delinquency. If this issue is not addressed, the cycle of dependency on assistance will likely continue into the next generation (United Nations High Comission for Refugees and World Food Programme 2017).

In 2016, 38–48 percent of the refugee population in all six camps earned no income (United Nations High Comission for Refugees, MIDIMAR, and UN Women 2016).

[10] Based upon 250 RWF per capita per day.

Consequently, the cash assistance or sale of food assistance is one of the primary earning opportunities for refugees, reported by 21 percent of households, as shown in Figure 8 (World Food Programme 2017). This coping strategy negatively impacts household food security since the assistance is calculated based upon providing kilocalorie needs. In Figure 8, 'Other' refers to cash for non-food items which was being provided by UNHCR at the time. This survey also found that cash camps resort to more coping strategies than food camps, suggesting that their resources run out towards the end of the month, mostly because the cash assistance is overstretched to cater for other non-food basic needs (United Nations High Comission for Refugees and World Food Programme 2017).

Figure 8. The main source of livelihoods according to refugees (World Food Programme 2017).



In the Congolese camps approximately 75–83 percent of the cash provided by WFP is used to buy food whilst the remaining money is used to repay food loans and buy essential non-food items. In Mahama, 70 percent of the food assistance is consumed by the household. Maize and oil are the main food assistance commodities sold, in terms of quantity, amounting to approximately 25 percent and 35 percent respectively of what is provided by WFP. The money earned from these sales is used to diversify the food basket, repay food loans and buy essential non-food items. In all camps a small number of refugees are engaged in farming activities and are able to consume their own produce, however this is on a very a small scale and is mostly limited to vegetables produced in kitchen gardens (United Nations High Comission for Refugees and World Food Programme 2017).

Despite the favourable policy in Rwanda, which allows refugees to work, move freely within the country, establish companies, pay taxes and create jobs, all those surveyed

cited several challenges to increasing their self-reliance. The most common issues were a lack of appropriate skills, lack of access to loans/start-up capital to begin or expand a small business, lack of refugee ID cards and unequal opportunities and wages between refugees and host community members on the labour market[11] (United Nations High Comission for Refugees and World Food Programme 2017).

Subsistence agriculture is the main livelihood strategy for Rwandans in areas surrounding the camps and the majority of Congolese refugees lived agricultural lifestyles prior to their arrival in Rwanda. However, due to extreme land pressure in Rwanda, refugees are not provided land in or around the camps to continue their agricultural livelihoods, therefore making self-reliance through farming a very unlikely option (United Nations High Comission for Refugees and World Food Programme 2017). Livestock keeping is forbidden in the camps due to space pressure, whilst keeping animals outside the camp is an option only for wealthier refugees who can afford the rental fees (United Nations High Comission for Refugees and World Food Programme 2017). Many refugees in the camps are involved in some sort of non-agricultural income generation in the informal sector such as petty trade, which is often the work of women. For example, women buy from satellite markets and resell the produce in the camps at a profit, others make beer for sale and some sell charcoal. Women are also involved in the restaurant business, selling tea and snacks. Some women leave the camp to become domestic workers (United Nations High Comission for Refugees and World Food Programme 2017).

Steps are being made through the MIDIMAR/UNHCR Strategy for Economic Inclusion of Refugees, to engage refugees in the local economies through the provision of skills training, access to loans and jobs (United Nations High Comission for Refugees and MIDIMAR 2016). As more refugees become involved in these initiatives and their self-sustainability through their income generation capacity grows, the possibility of reducing assistance will become viable. It is essential that youths are able to access these services once they finish school to break the cycle of dependence.

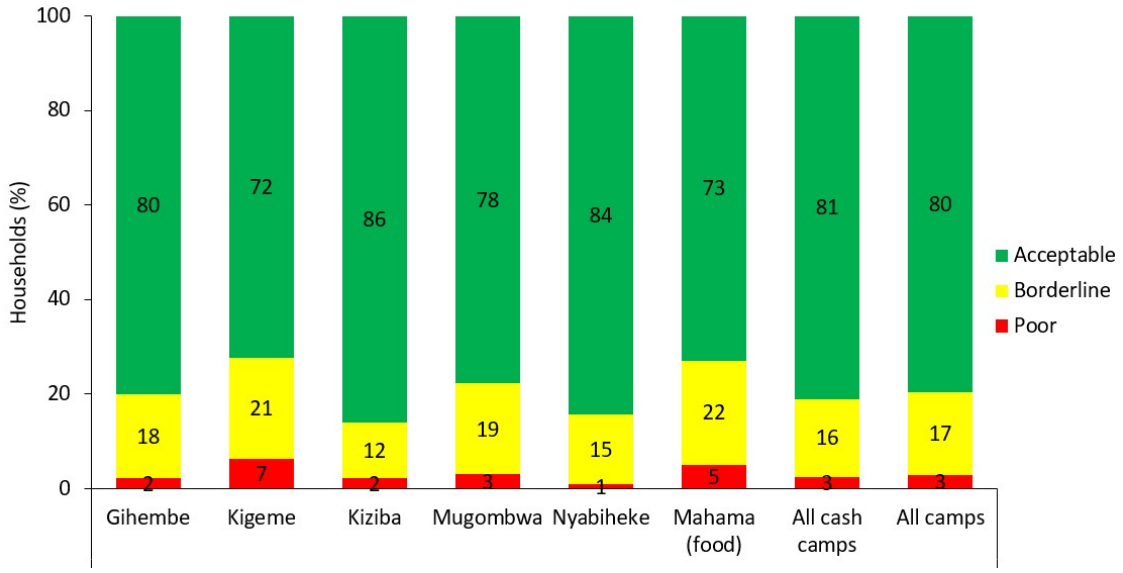
Household Food Consumption and Dietary Diversity

3. Household food consumption is mostly acceptable but dietary diversity is low. A nutritious diet costs almost twice as much as a diet that only meets energy needs. General food assistance (cash and food) should be complemented with other livelihood and income earning opportunities to enable dietary diversification and to cover essential non-food needs.

[11] Based upon interviews with refugees. The wage gap has not been quantified.

In 2018, the majority of refugee households (80 percent) had an acceptable food consumption score (FCS)[12] as shown in Figure 9 (World Food Programme 2018). This is a marked improvement since the 2014 PDM, where only 63% of households had acceptable FCS (United Nations High Comission for Refugees and World Food Programme 2014). Mahama and Kigeme camps had the highest percentage of households with borderline or poor FCS, which aligns with their higher rates of malnutrition compared to the other camps. More households in Mahama camp had borderline and poor FCS compared to the Congolese cash camps (22 percent vs. 16 percent for borderline and 5 percent vs. 3 percent for poor) (World Food Programme 2018).

Figure 9. FCS by individual camp, camps based upon type of assistance and all camps in 2018 (World Food Programme 2018).



Despite most households having an acceptable FCS, household's dietary diversity and the consumption of fresh, micronutrient-rich foods is moderate. Figure 10 shows that on average refugee households are consuming a moderately diverse diet of about 4 out of 10 food groups and that this had not changed much between 2016 and 2017, despite the majority of camps switching over to cash based assistance during that time (World Food Programme 2017).

[12] Food consumption score: WFP's indicator for measuring food insecurity, used to define categories of household food insecurity. It is calculated using the frequency of consumption of different food groups by a household during the 7 days before the survey.

Figure 10. Average dietary diversity by individual camp, camps based upon type of assistance and all camps in 2018 (World Food Programme 2017)

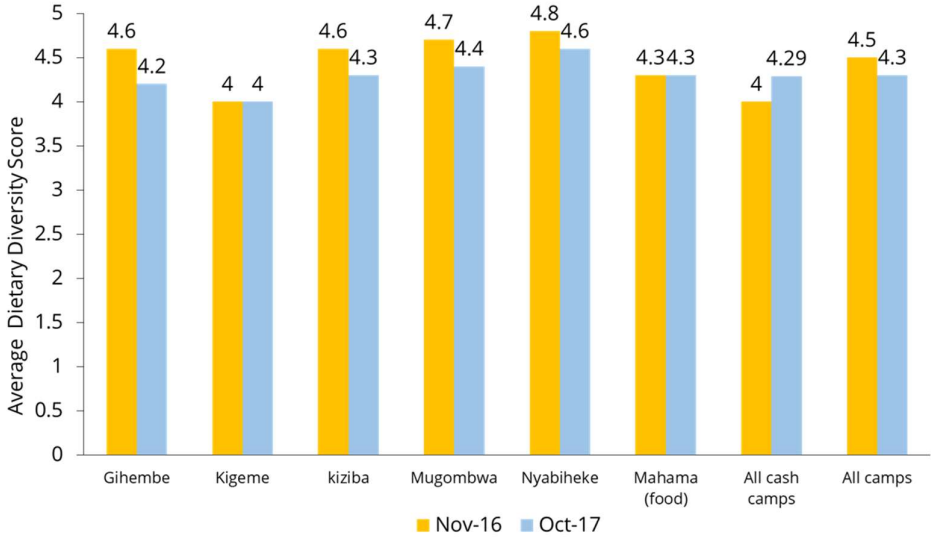
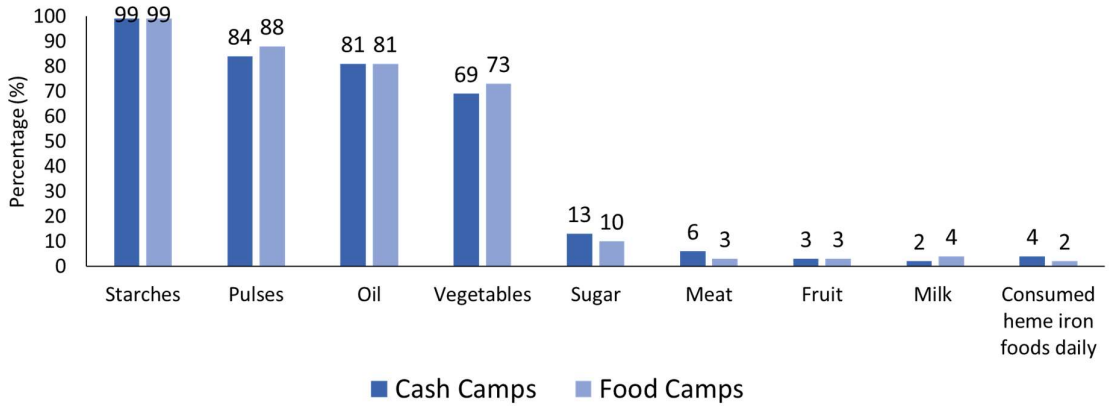


Figure 11 shows that diets mostly comprise of cereals, pulses, oil and vegetables. Although households (81–96 percent) consumed plant based vitamin A rich foods daily or sometimes (mostly dodo leaves), only 2-4 percent of household consumed heme-iron rich animal source foods daily. Figure 11 shows that the diets of households currently do not differ substantially by assistance modality. Marginally more households in the Congolese cash camps consumed meat products (6 percent vs. 3 percent) and heme-iron foods (4 percent vs. 2 percent) 5 to 7 days in a week. Furthermore, a slightly higher number of households in the cash camps reported consuming sugar (13 percent vs. 10 percent) (World Food Programme 2017). Low consumption of iron rich foods is likely to be due to issues related to availability and economic access, both of which are explored further in the following sections.

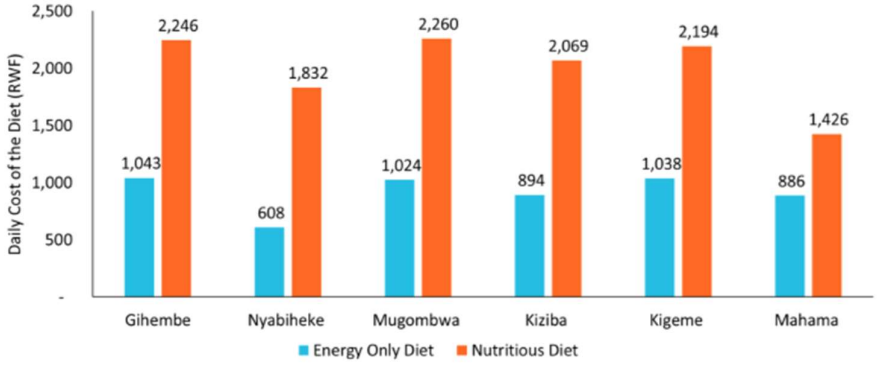
Figure 11. The percentage of households consuming different food groups by assistance modality (World Food Programme 2017).



Economic Access

The CotD analysis displayed in Figure 12 found that it would cost almost twice as much for a household of five to purchase a nutritious diet from markets inside the camps than a diet that only met their energy needs (608 – 1 043 Rwandan Francs (RWF) per day vs. 1 426 – 2 260 RWF a day). The energy only diet costs the highest in Gihembe and the lowest in Nyabiheke whilst the nutritious diet costs the highest in Mugombwa and the lowest in Mahama.

Figure 12. The cost of a nutritious diet for a five-person household in the six refugee camps in RWF per day.



The CotD analysis also found that the general food distribution given in Mahama provided the majority of macronutrient requirements for a household but was low in essential micronutrients as Figure 13 shows. For example, the ration provided all energy and protein requirements but only 25 percent of calcium and 47–48 percent of vitamin B12 and iron requirements. The outstanding micronutrients would need to come mainly from animal source foods such as eggs, milk, dried fish and meat purchased on the market.

Figure 13. The percentage of nutrient requirements provided by the in-kind food ration for a household of 5 people.

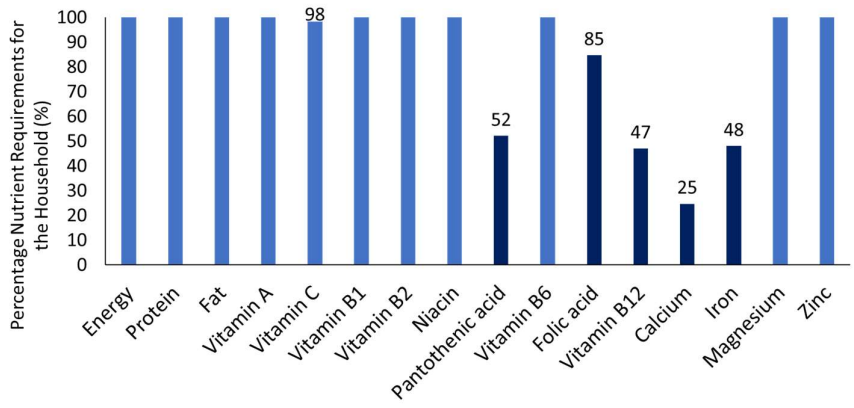
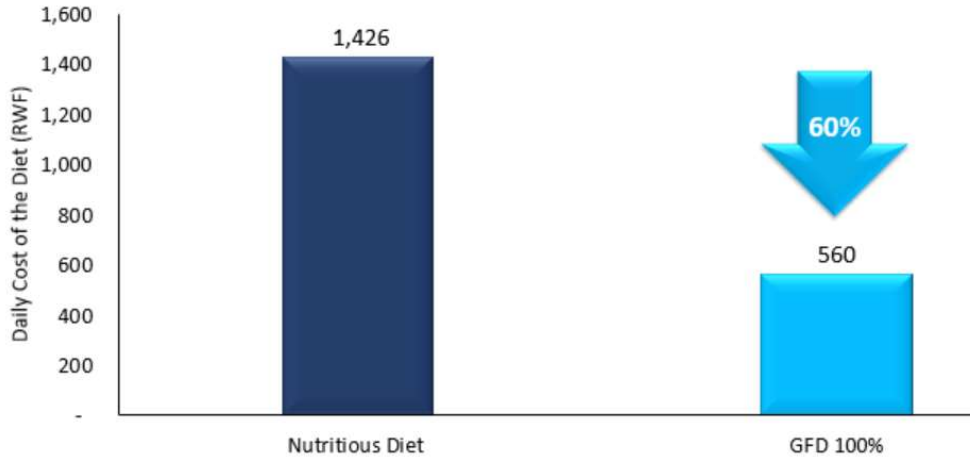


Figure 14 shows that, despite being low in some essential micronutrients, the general food distribution covers 60 percent of the cost of a nutritious diet. The CotD analysis estimated that households would need to add approximately 560 RWF per day to meet their remaining vitamin and mineral needs from foods such as dried fish, dodo leaves, avocados, eggs and milk. Data on the average daily income for households living in Mahama is scarce but in 2016 was found to be approximately 457 RWF[13] of which 75 percent was generated by selling food assistance rations (World Food Programme 2016b). It is therefore very unlikely that households in this camp would be able to afford a nutritious diet as it would require compromising more of their food assistance.

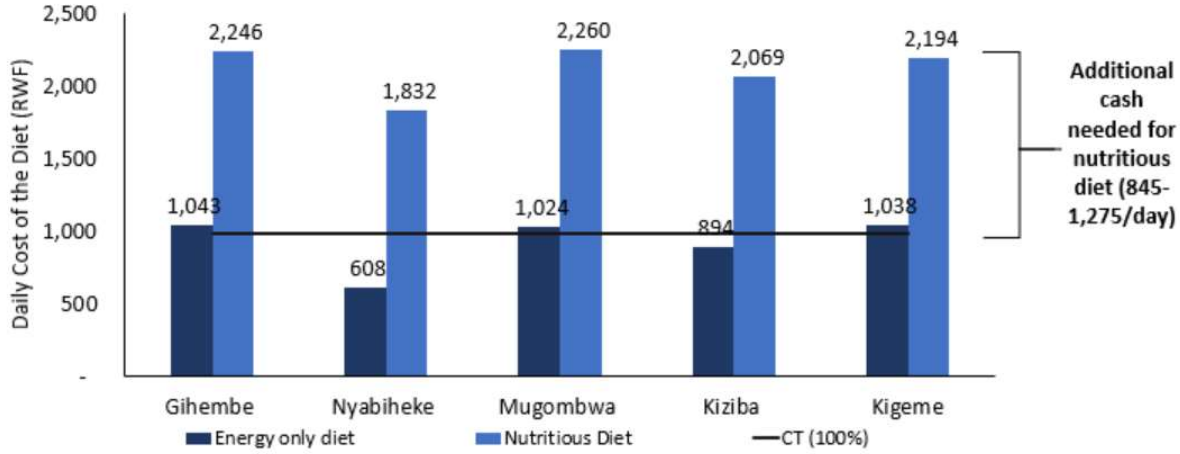
Figure 14. The daily cost of a nutritious diet for a household of five people in Mahama camp and the cost of this diet factoring in the receipt of the full food assistance ration, which meets 100 percent of energy needs but not all micronutrient needs.



Regarding the Congolese cash camps, Figure 15 shows that when non-food expenditure[14] is accounted for, the current cash transfer value is only enough for households to purchase a diet that meets energy requirements but would need to be doubled to be able to purchase a nutritious diet. The cash transfer value covers 47 percent[15] of the cost of a nutritious diet, but households would require between 845 and 1,275 RWF per day more to purchase foods to meet their remaining needs. In comparison, the total daily income in the cash camps in 2016 was 1,429 RWF of which 88 percent was earnt selling off their food aid or cash assistance (World Food Programme 2016b). A nutritious diet could therefore potentially be affordable but almost all income would need to be spent on food, which is unrealistic given that households also have essential non-food needs.

[13] More recent data was not available.
[14] Assumed at 79 percent based upon 2017 PDM findings. This equated to a transfer of 987 RWF a day (World Food Programme 2017).
[15] Calculated by subtracting the money from the cash assistance spent on food from the cost of a nutritious diet and calculating the proportion remaining from the total nutritious diet cost.

Figure 15. The daily cost of an energy only and nutritious diet in the Congolese cash camps. Black line signifies the value of the cash-based transfer spent on food which was estimated at 987 RWF per day.



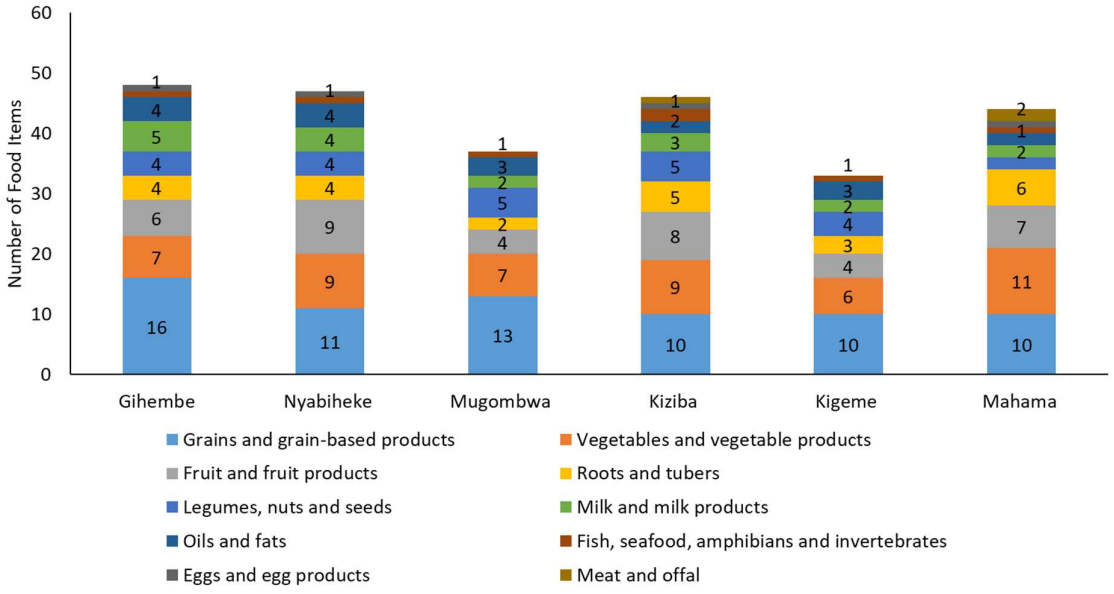
Limited dietary diversity in refugee households was attributed to inadequate size of cash value and of in-kind food assistance in the 2017 JAM survey (United Nations High Comission for Refugees and World Food Programme 2017). Furthermore, low cash value was one of the main issues with cash redemption as reported by refugee households particularly in Mugombwa (91 percent) and Gihembe (70 percent) camps (World Food Programme 2017). Various market assessments, including monthly price monitoring inside and outside the camps have found that although they are generally well-integrated and the prices are relatively similar, small price difference across the camp locations, as well as buying on markets in the camp compared to markets outside the camp, can have comparatively large financial implications for refugees when buying their food (World Food Programme 2014, 2016a; United Nations High Comission for Refugees and World Food Programme 2017). Data from the market monitoring system in the 2017 JAM survey found that from November 2016 – July 2017 that the cash value of the food assistance transfer was less than the cost of the monthly food basket in at least three, if not four of the camps (United Nations High Comission for Refugees and World Food Programme 2017). This analysis therefore shows that non-affordability is a key barrier to households consuming a nutritious diet and reinforces the need for sustainable income generating opportunities.

Food Availability

Market assessments and JAM surveys report adequate food availability in markets that serve the camps (World Food Programme 2014, 2016a; United Nations High Comission for Refugees and World Food Programme 2017). Refugees interviewed during the JAM survey were reportedly satisfied that the markets in and around the camps sold everything they needed. The CotD market survey found that the number of food items

available on markets inside the camps ranged from 33 in Kigeme to 48 in Gihembe which suggests good availability. Figure 16 shows that grains and cereals had the largest number of different items whilst eggs, fish and meat had the fewest. Meat was only available in the markets in two camps: Kiziba and Mahama; but it is important to note the possibility of other camps to source those products from neighbouring local markets. What's more, refugees are not permitted to raise cattle such as ruminants, sheep and goats in the camps, thus further hindering their access to animal proteins. An adequate diversity of fruit, vegetables and pulses were found on the markets.

Figure 16. The number of individual food items found on markets inside the refugee camps by food group.



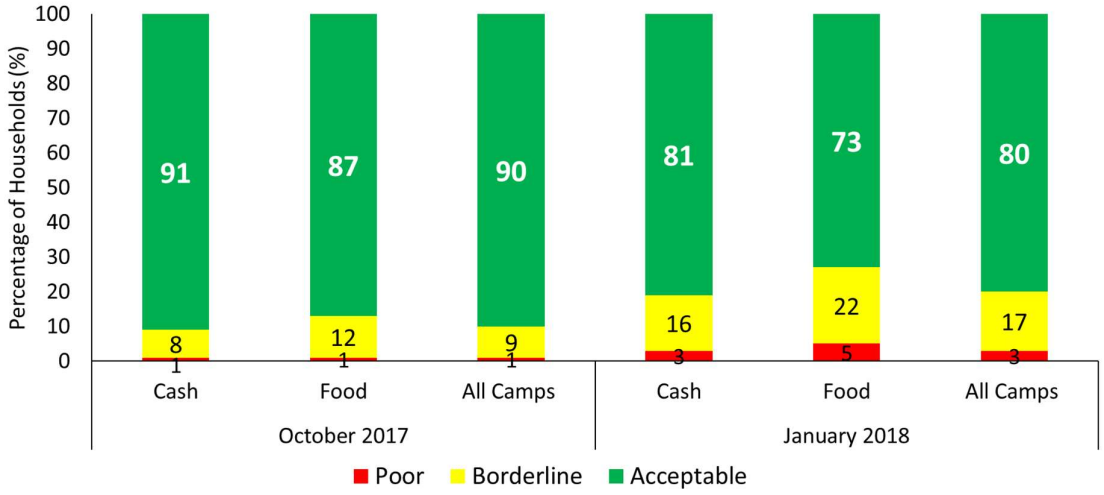
The common narrative when comparing the difference between in kind food and cash is that cash results in increased dietary diversity. These results show that this will only be the case for refugees in Rwanda if: 1) the transfer is increased so that it will be large enough to purchase nutritious food, 2) nutritious fresh food is available and, 3) social behaviour change communication is undertaken to inform purchasing choices.

Impact of Ration Cuts

4. Recent ration cuts mean households are employing coping strategies which have negatively impacted food security indicators, particularly household dietary diversity. The CotD results emphasize difficulties households have in meeting their nutrient needs with a reduced ration.

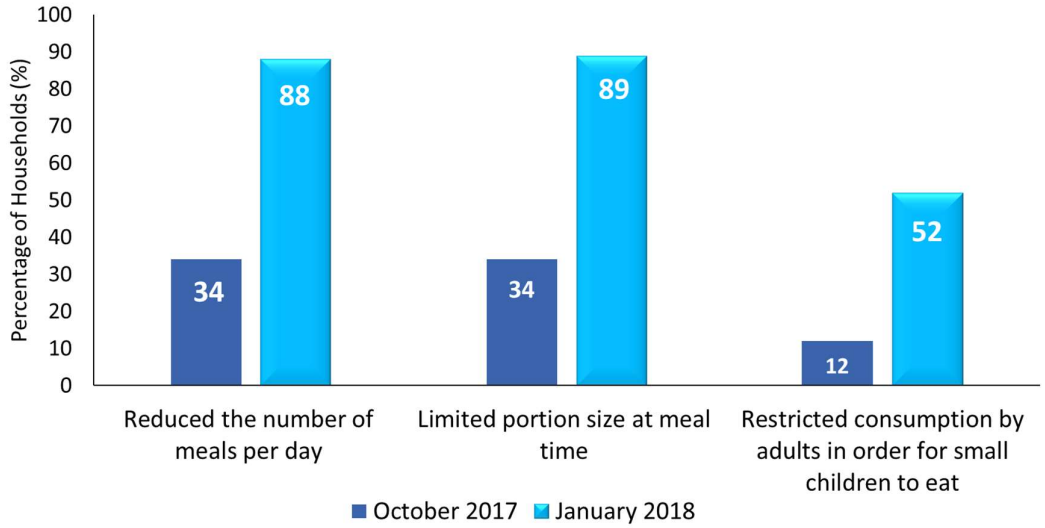
In November and December 2017, the general food assistance (both cash and food) size was reduced by 10 percent due to funding constraints. In January 2018, this reduction was increased to 25 percent. Findings from a WFP survey in 2018 found that as a result of these ration cuts the percentage of households with poor and borderline food consumption doubled as shown in Figure 17 (World Food Programme 2018). Dietary diversity halved within the camps from 4.3 food groups to 2.5 in the Congolese cash camps and 1.9 in Mahama (World Food Programme 2018).

Figure 17. FCS by camps based upon type of assistance and all camps before and after the ration cuts (World Food Programme 2018).



What's more, the percentage of households employing consumption-based coping strategies more than doubled with 52 percent of households stating that adults restricted their food consumption for children to eat, whist almost 90 percent reported reducing the number and portion sizes of their meals as shown in Figure 18 (World Food Programme 2018). These results are worrying given the reliance on food assistance to meet food needs as well as its sale to meet other food and non-food needs.

Figure 18. The percentage of households employing consumption-based coping strategies before and after the ration cuts (World Food Programme 2018).



Figures 19 and 20 show the potential impact that the ration cuts have on households' ability to purchase a nutritious diet. Figure 19 shows that households in Mahama would require 668-696 RWF a day to be able to purchase a nutritious diet whilst Figure 20 shows that for the Congolese cash camps, a 25 percent reduction in cash results in households in four of the five camps not being able to purchase enough food to meet just their energy needs.

Figure 19. The daily cost of a nutritious diet for a household of five people in Mahama camp with different in-kind food ration sizes in RWF.

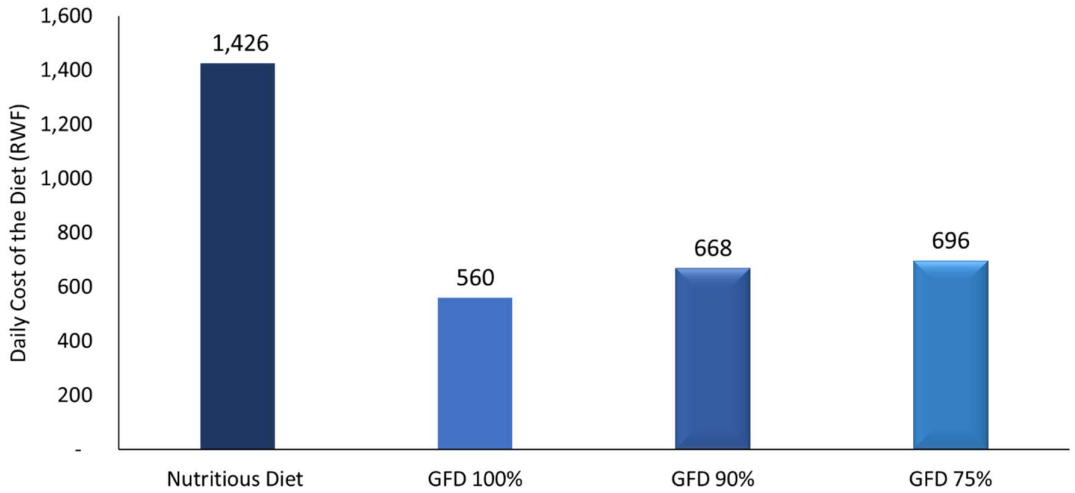
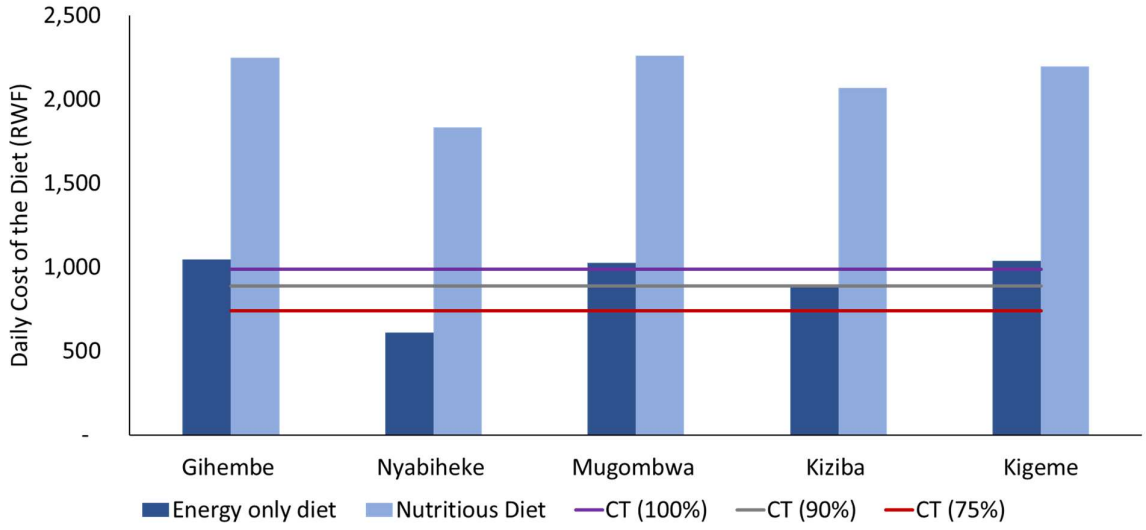


Figure 20. The daily cost of the energy-only and nutritious diet and the amount provided by different cash transfer values in the Congolese camps.



The scaling down of food assistance is a reality that needs to be addressed immediately; this should be accompanied by re-thinking on how to provide further robust and wide-ranging livelihood support, focusing on the long-term goal of transitioning refugees successfully from assistance to independence (United Nations High Comission for Refugees and World Food Programme 2017).

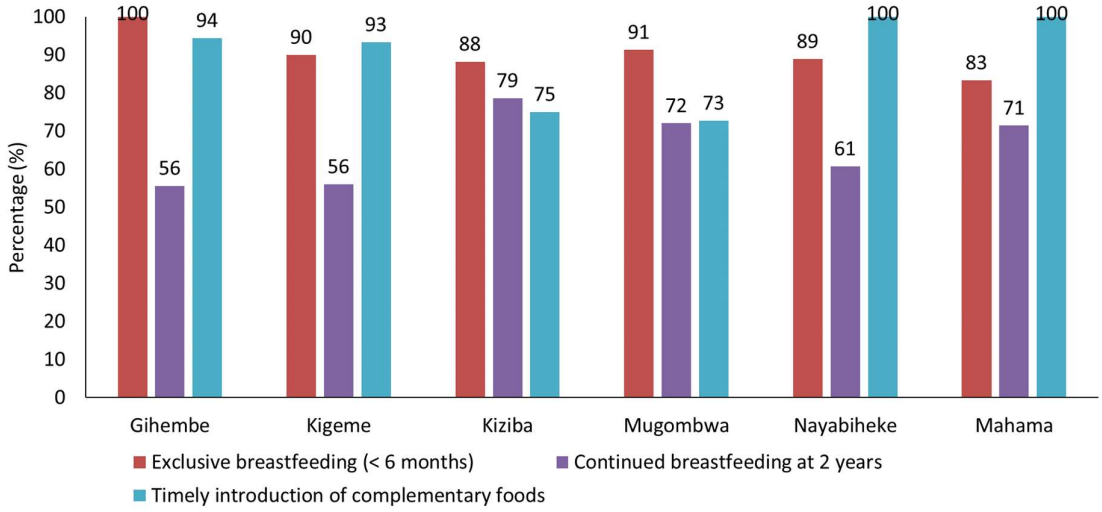
Infant and Young Child Feeding Practices

5. Breastfeeding is widely practiced but timely introduction of complementary feeding is suboptimal precluding adequate nutrient intake in children aged 6-23 months. Ration cuts have negatively impacted on the achievement of the child's Minimum Acceptable Diet.

Breastfeeding

Figure 21 shows that 83–100 percent of mothers in the refugee camps reported exclusively breastfeeding their children aged 0-5 months. This figure also shows that improvements in continued breastfeeding to 2 years could be made in Gihembe, Kigeme, Nayabiheke and Gihembe. The timely introduction of complementary foods also needs improvement in Kiziba and Mugombwa (United Nations High Comission for Refugees, World Food Programme, and United Nations Children's Fund 2018).

Figure 21. Infant and Young Child (IYCF) Indicators by camp.

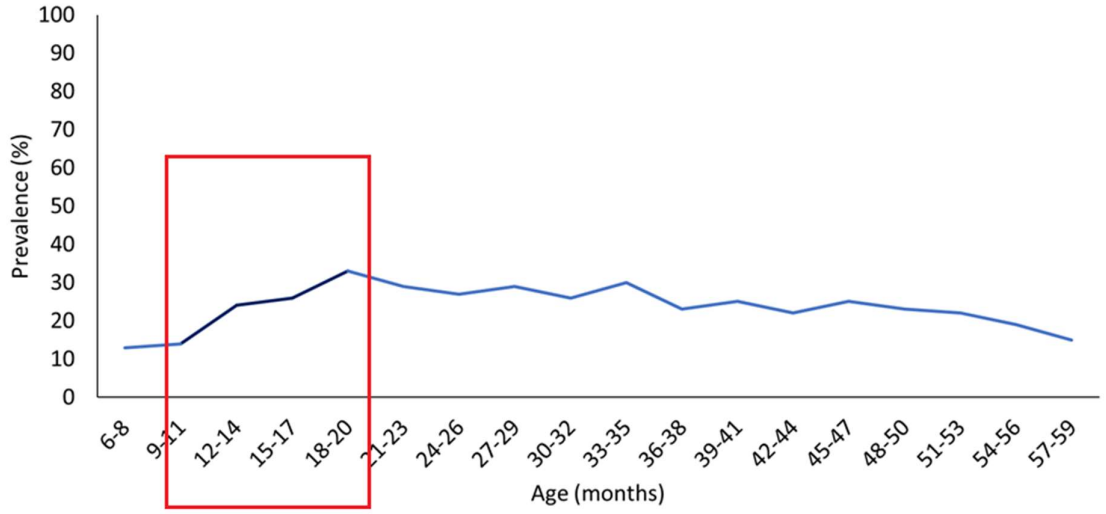


On average, the percentage of mothers who practiced continued breastfeeding at 1 year and the timely introduction of complementary foods is the same in both host[16] and refugee communities at 93 percent and 89 percent respectively. Exclusive breastfeeding is slightly higher in refugee camps compared to host communities (91 percent vs. 87 percent) (National Institute of Statistics of Rwanda, Ministry of Health, and ICF International 2015; United Nations High Comission for Refugees, World Food Programme, and United Nations Children's Fund 2018).

Figure 22 shows the trends in stunting by age averaged across the camps, which peak at 11–20 months which indicates that complementary feeding does not provide the required variety and amount of nutrients. WHO recommends that from 6 months of age children are fed a diverse diet (at least 4 food groups) twice a day for children 6-8 months and three times a day for children 9-23 months with continued breastfeeding. If a child is no longer breastfed, WHO recommends a child receives milk or milk products twice a day with the same food frequency and dietary diversity as recommended for breastfed children. These criteria are referred to as the Minimum Acceptable Diet (MAD).

[16] Please note, host population data is taken from 2015 whist refugee data is taken from 2018.

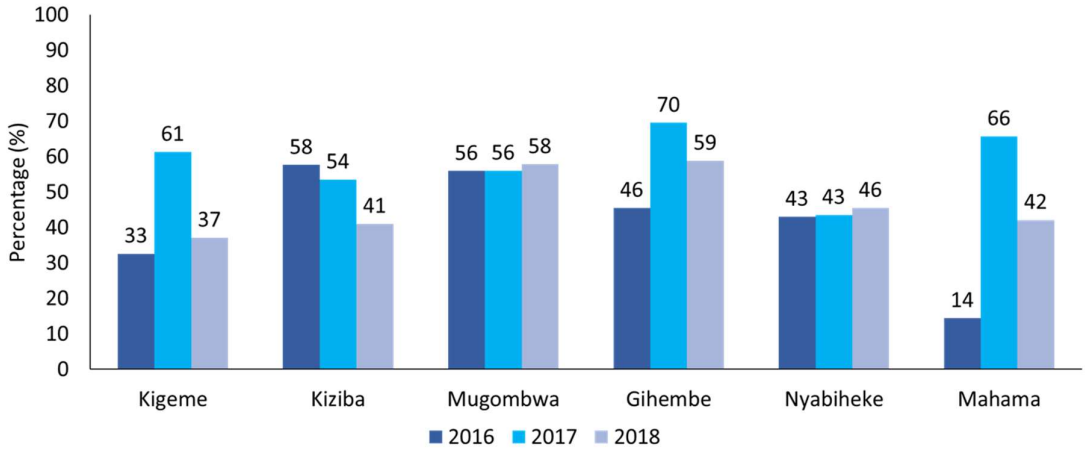
Figure 22. Trends in stunting prevalence by a child's age (United Nations High Comission for Refugees, World Food Programme, and United Nations Children's Fund 2018).



Complementary Feeding

According to the 2018 SENS, 47 percent of children in the refugee camps achieved Minimum Acceptable Diet (MAD), a reduction from 58 percent in 2017 (United Nations High Comission for Refugees, World Food Programme, and United Nations Children's Fund 2018). Figure 23 shows that progress in improving MAD in the individual camps over time has been inconsistent with four of the six camps experiencing a large drop in MAD from 2017 to 2018. This could be a result of the ration cuts between 2017 and 2018, although when asked, stakeholders couldn't provide conclusive reasoning for these trends. The large increase in MAD in 3 of the camps from 2016 to 2017 could be due to the MCHN programme, as SuperCereal Plus was included as an iron rich food source in these MAD calculations. The inclusion of this special fortified food in the calculation could be the reason why MAD in the camps is higher than among the host population, which is 17 percent (United Nations World Food Programme, National Institute of Statistics of Rwanda, and Ministry of Agriculture and Animal Resources 2018). On average, 41 percent of children achieved MMF whilst average dietary diversity score (the only indicator of dietary diversity available) was 4.3 (United Nations High Comission for Refugees, World Food Programme, and United Nations Children's Fund 2018).

Figure 23. The percentage of children aged 6-23 months achieving MAD in 2016, 2017 and 2018 (United Nations High Comission for Refugees, World Food Programme, and United Nations Children's Fund 2018).



Refugee children rely on supplements, fortified food and/or home fortificants[17] as major sources of micronutrients. Eighty eight percent of mothers reported that their children consumed iron-rich foods (or iron-fortified foods as there were few other sources of iron-rich food), for 70 percent SuperCereal Plus and for 29 percent Multiple Micronutrient Powders (MNP) was the source of iron. A mere 1 percent consumed iron-rich fresh food such as meat (United Nations High Comission for Refugees, World Food Programme, and United Nations Children's Fund 2018).

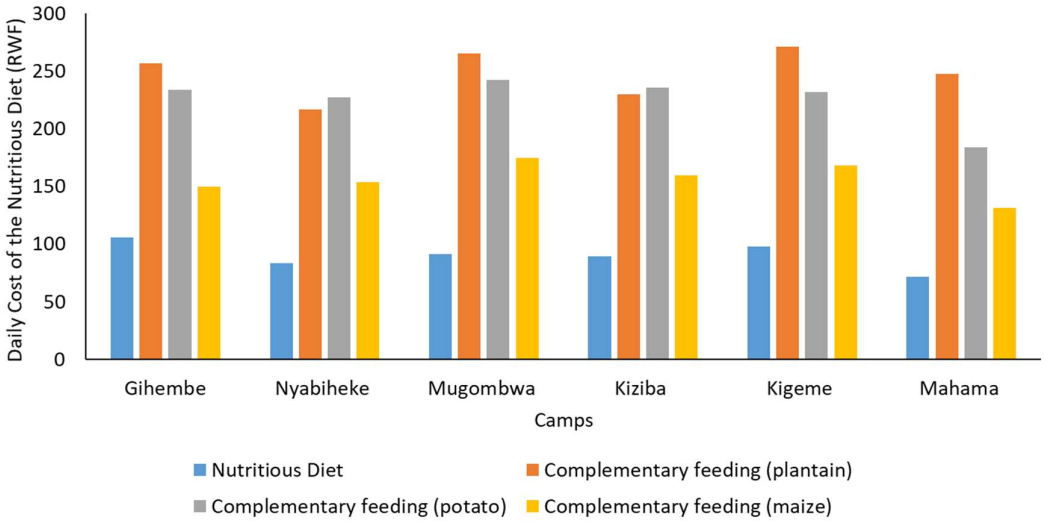
The main barrier to adequate complementary feeding, i.e. the inclusion of animal source foods, is their unaffordability due to poor earning opportunities. This means that households need to rely on WFP assistance which is insufficient to provide access to a nutritious diet. Mothers reported having to leave young children with their siblings when they needed to leave the camps to find work (United Nations High Comission for Refugees and World Food Programme 2017). SuperCereal Plus and MNPs are good micronutrient gap fillers for children whose diets are low in diversity. The lower levels of stunting and anaemia as compared to the host population indicates better dietary quality and possibly less illness among the refugee children.

The CotD software was used to model the cost of the complementary feeding recipes recommended by the Ministry of Health, which are also being promoted within the camps (Ministry of Health 2014)[18]. These recipes include foods such as soybeans, tomatoes and fresh fish which, although very nutritious, are also expensive. Figure 24 shows that the first two recipes which include fresh fish (which was more expensive than dried fish on

[17] Such as Multiple Micronutrient Powder (MNP)
[18] For details of the recipes and modelling assumptions, please see Annex 4.

the market), on average more than double the cost of the nutritious diet for the child aged 6-23 months. The third recipe includes dried fish, but still increases the cost of the nutritious diet. Therefore, the recommended complementary feeding recipes may not be affordable for many refugee households and support the finding that accessibility of nutritious foods may be negatively impacting the diets of young children. Alternative foods that could be included in the recipes, which were found to be nutritious and less expensive by the CotD analysis were groundnuts, avocado and eggs.

Figure 24. Daily cost of a nutritious diet for a child aged 6-23 months, with different complementary feeding recipes.



Adolescent Girls' and Women's Nutritional Status and Diets

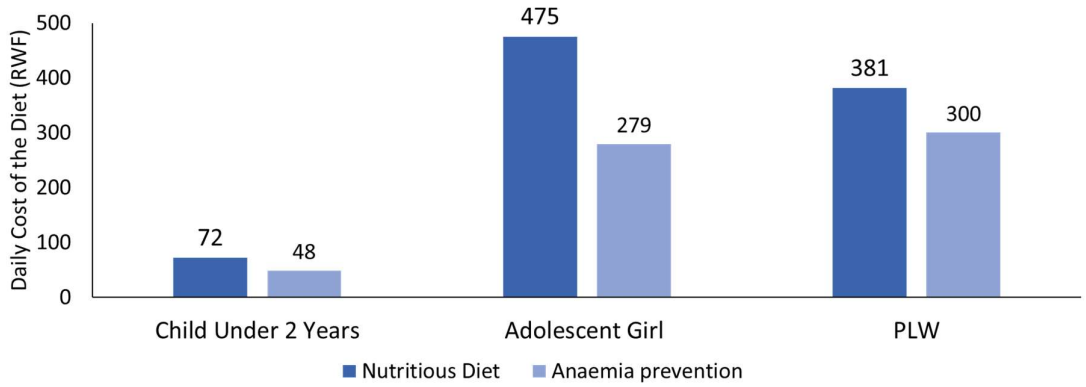
6. The little data that does exist on the diets of women and adolescent girls in refugee camps suggests that their diets are poor and that this is contributing to malnutrition in their children.

Nutritional Status

In 2018, anaemia prevalence among non-pregnant women of reproductive age was on average 11 percent, which is classified according to WHO as an issue of mild public health concern (United Nations High Comission for Refugees, World Food Programme, and United Nations Children's Fund 2018). This is 8 percent lower than the national average in the host population, which was 19 percent in 2015 (2018 data not available) (National Institute of Statistics of Rwanda, Ministry of Health, and ICF International 2015). The prevalence of anaemia in women was the lowest in Kigeme camp at 7 percent and the highest in Mahama at 16 percent (United Nations High Comission for Refugees, World Food Programme, and United Nations Children's Fund 2018).

To address the higher rates of anaemia in Mahama camp, as well as complement the in-kind food assistance, a weekly fresh food voucher for 1kg beef and 500g oranges is provided to households with a PLW or a child under 2 years. This intervention was modelled using the CotD software to better understand its potential to improve access to essential nutrients for a child under 2 years, an adolescent girl and a PLW.[19] Figure 25 shows that this intervention could reduce the cost of a nutritious diet by an average of 32% for these vulnerable groups and emphasises the important role that animal source foods play on providing essential nutrients, particularly iron. Sadly, this intervention is no longer being implemented in the camps due to funding restrictions.

Figure 25. The daily cost of a nutritious diet for a child under 2 years, an adolescent girl and a PLW with and without the anaemia prevention programme in Mahama.



Health-seeking behaviours such as ANC visits during pregnancy could be improved. Sixty eight percent of pregnant women received iron and folic acid tablets whilst 73 percent received SuperCereal[20], both of which are good sources of iron (and other micronutrients in the case of SuperCereal) and can contribute to prevention of anaemia during pregnancy. Coverage was lowest in Mugombwa due to stock outs (52 percent received iron and folic acid tablets and 57 percent received SuperCereal, oil and sugar) and highest in Gihembe for iron and folic acid supplements and Kigeme for SuperCereal, oil and sugar (United Nations High Comission for Refugees, World Food Programme, and United Nations Children's Fund 2018). Seventy six percent of refugee women slept under a mosquito net during pregnancy. All women did this in Gihembe camp whilst only 43 percent did so in Kigeme, which may be an indication of households reselling bednets to buy other basic needs (United Nations High Comission for Refugees, World Food Programme, and United Nations Children's Fund 2018).

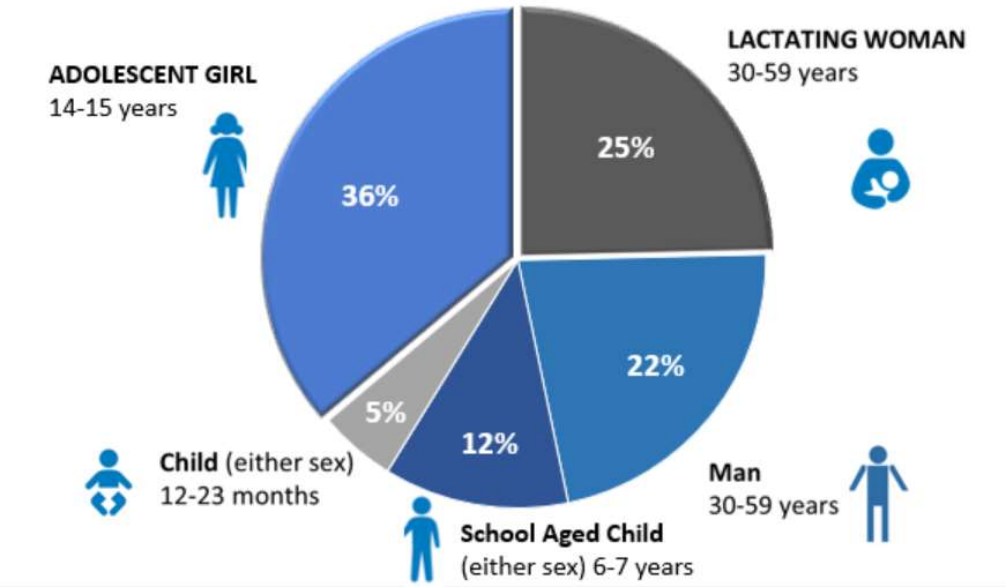
[19] The assumptions made for this model can be found in Annex 4. Adolescent girls are currently not targeted by this programme.
[20] Through WFPs MCHN programme.

Diets

The CotD results shown in Figure 26 emphasise the high nutrient needs of adolescent girls and PLW and illustrates that 61 percent of the household cost of a nutritious diet should be allocated to meeting their requirements. The 2017 JAM survey found that not everyone has equal access to food in the household. According to survey participants, when food is scarce, parents prioritise feeding their children over themselves and in some cases, women will prioritise the men in the house over themselves. The JAM tried to ascertain whether cultural practices affected the order of eating in the household or the size of the portions but the information gathered was very conflicting and differed from home to home (United Nations High Comission for Refugees and World Food Programme 2017). Data on women's diets is limited but, according to the 2018 SENS survey, only 6 percent of women achieved Minimum Dietary Diversity[21] (MDD-W) (United Nations High Comission for Refugees and World Food Programme 2017). There was no information available on the diets of adolescent girls. The high prevalence of anaemia in children at 6 months (70 percent) though implies that mothers are not laying down adequate iron stores for their children during the first six months of life (United Nations High Comission for Refugees, World Food Programme, and United Nations Children's Fund 2018), indicating that coverage, and potentially compliance and utilization, of IFA and SC during pregnancy should be improved and dietary diversity among all population groups should be improved.

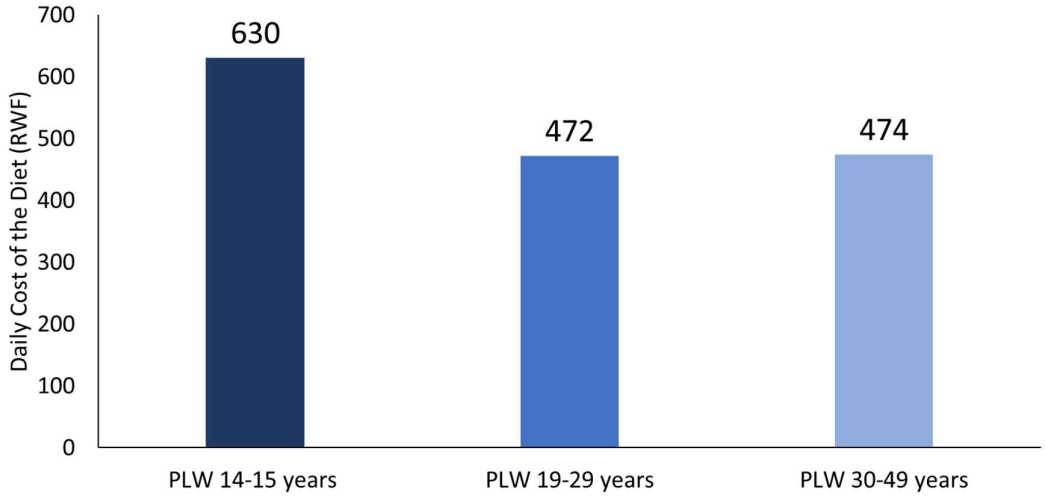
[21] MDD-W is a dichotomous indicator of whether or not women 15–49 years of age consumed at least five out of ten predefined food groups the previous day and night. The proportion of women 15–49 years of age who reach this minimum in a population can be used as a proxy indicator for higher micronutrient adequacy, an important dimension of diet quality.

Figure 26. The percentage cost of a modelled nutritious diet that should be attributed to different household members in Rwanda, according to Cost of the Diet analysis.



Comparatively little is known about the nutrition, health and diets of girls and boys aged 10-14 as they are generally subsumed into the category of children, which are also not usually surveyed, a data gap which makes it difficult to assess trends and needs (Presler-Marshall and Stavropoulou 2017). Concurrently, girls 15-18 are often subsumed into the category of women of reproductive age. A lack of data and evidence makes it difficult to learn from existing programming and identify the most effective and sustainable interventions to protect girls of different ages (Presler-Marshall and Stavropoulou 2017). A CotD scenario model was run to better understand how the cost of a nutritious diet changes if an adolescent girl was to become a PLW. As demonstrated by Figure 26, adolescence is a time of increased micronutrient requirements for girls, which further increases should they become pregnant or breastfeed. Figure 27 shows that these increased requirements of adolescence equate to a 25 percent higher cost of a nutritious diet compared to a woman aged 19-59 years (reproductive age). The percentage of adult women that gave birth before the age of 18 is not known for the refugee camps but given that a younger age at first birth of the mother has been associated with an increased risk of stunting in children, this analysis further demonstrates the need to delay age at marriage and first pregnancy until adult age as well as target adolescent girls with nutritional interventions and provides impetus to promote family planning and sexual and reproductive health education, also for adolescent girls and boys.

Figure 27. The daily cost of a nutritious diet in RWF for an adolescent girl and a woman of reproductive age.



The data gaps identified for women and adolescent girls include: body mass index by age; consumption of vitamin A and iron rich-food; prevalence of deworming; age at first birth; what foods they are eating and; if and how diets of women and girls change when they are pregnant or breastfeeding.

Cost of the Diet Modelling

7. Current targeted nutrition programmes, in combination with general food assistance (food or cash), can reduce the cost of a nutritious diet for refugee households. However, combined programmes are not enough to meet all of the household's nutrient needs, emphasizing the need to increase income through access to skill-building and livelihoods opportunities.

Current Interventions Provided by WFP

The targeted programmes delivered by WFP that were modelled using the CotD software were the MCHN programme as part of which children aged 6-23 months receive Supercereal Plus and PLW receive Supercereal, oil and sugar, and the Early Child Development (ECD) programme where enrolled children aged 3-5 years receive Supercereal and oil[22]. Figures 28 and 29 show the potential impact that these interventions, separately and combined, could have on reducing the cost of a nutritious diet for households in the camps: by 74 percent in the Congolese cash camps and by 66 percent in Mahama camp when combined with the food assistance[23].

[22] Refer to Annex 4 for more information. Congolese camps provide take home rations whilst Mahama does wet feeding in kitchens.
[23] As modelled in section 2.

The targeted interventions for nutritionally vulnerable groups provide a large share of their macro and micronutrient needs, particularly for a child under two years. However, the figures show that to meet their remaining nutrient requirements, households would still require 482 RWF a day in Mahama and between 421 and 726 RWF in the cash camps. These results emphasise the need for additional, multisectoral interventions as well as improving access to income generating activities to ensure households can afford a nutritious diet.

Figure 28. Daily cost of a nutritious diet with and without targeted nutrition interventions for a household of five people in the Mahama camp in RWF.

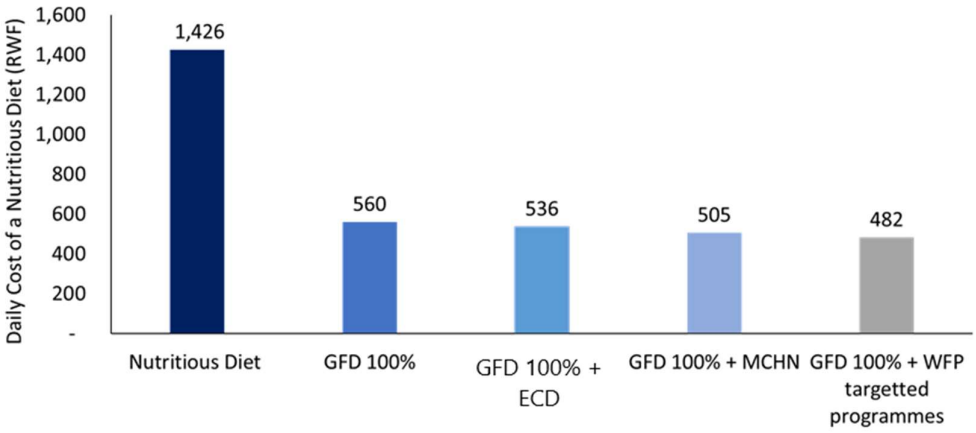
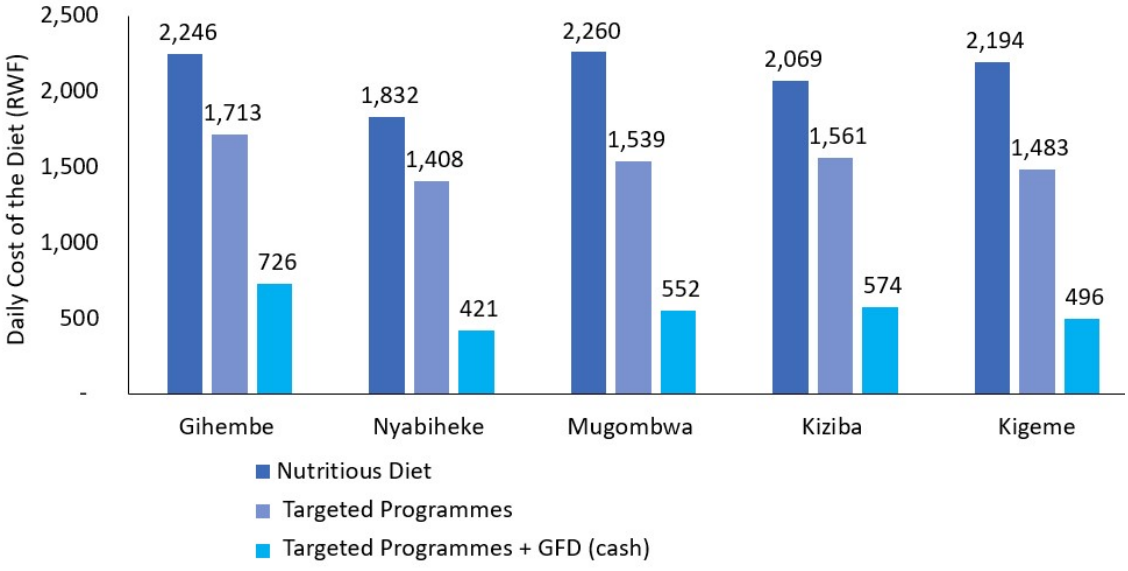


Figure 29. Daily cost of a nutritious diet with and without targeted nutrition interventions for a household of five people in the Congolese cash camps in RWF.



Context-specific integrated packages of interventions have the greatest potential to reduce the cost of a nutritious diet for the household and nutritionally vulnerable groups, and thus improve nutrient intake and ultimately nutritional status and health.

To fully understand the potential that multisectoral programming aimed at both targeted individuals and the household could have on improving access to nutrients in the camps, stakeholders were asked to list the interventions currently being provided or that could be new, to model using the Cost of the Diet software. These interventions are shown in Table 2 and span across different entry points and transfer modalities and range across both short-term and long-term solutions. The interventions aimed at specific target groups were nutrition specific and are essential in the short term to improve nutrition on a population level. This analysis does not suggest that this is all that needs to be done. It is essential that longer term interventions that improve the affordability and availability of nutritious, fresh foods are undertaken in conjunction with short term solutions so that nutrition security is sustainable. These longer-term solutions were modelled at a household level.

For a full list of assumptions and specifications for each model, please refer to Annex 4.

Table 2: The targeted and household interventions modelled to improve nutrient intake as suggested by stakeholders during the consultation meetings.

Intervention	Target Group	Transfer Modality	Entry Point(s)
MNP	Child 6–23 months	In-kind/voucher	Health Social Protection
MCHN[24]			
Nutrition Sensitive School Meals[25]	School Aged Child	In-kind	Education
Iron and Folic Acid Supplement	Adolescent girl	In-kind/voucher	Health

[24] Provision of Supercereal Plus

[25] Supercereal and sugar with milk, fruits and vegetables (carrots, cabbage, banana and avocado) and dried fish modelled separately and in combination. Models run for children 4-5 years and 6-7 years to represent ECD and school age. What is provided in the ECD programme to children 4-5 years is also provided in school meals to the host population thus this provided the basis of the nutrition sensitive school meal models.

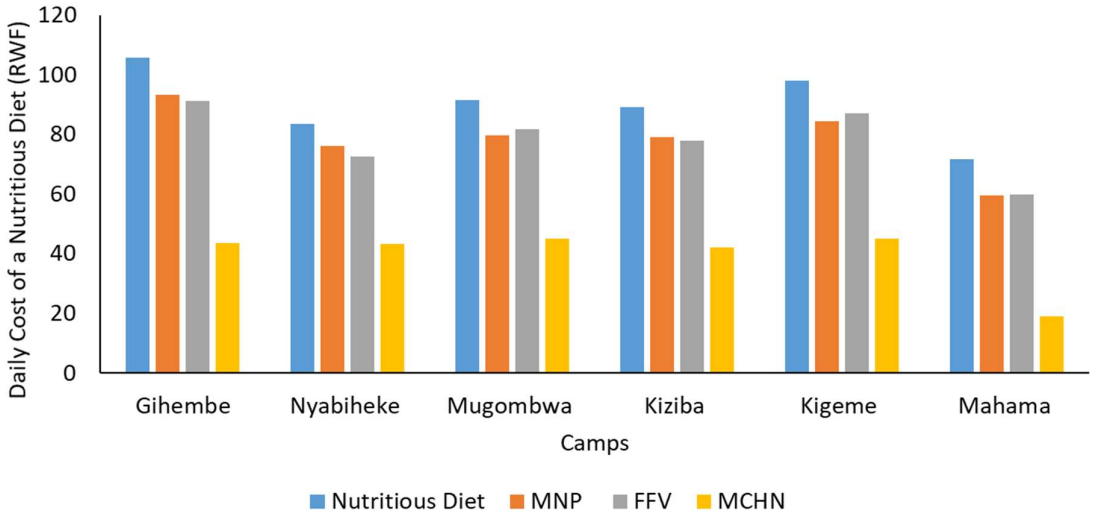
Intervention	Target Group	Transfer Modality	Entry Point(s)
Multiple Micronutrient Tablet (MMT)	PLW		Social Protection
MCHN [26]			
Nutrition-Sensitive Kitchen Gardens[27]	Household	Own Production	Agriculture Markets
Smallholder Poultry Intervention[28]			
Smallholder Rabbit Intervention[29]			
Fortified Rice (Congolese Cash Camps only)		Market	Markets
Fresh Food Vouchers (FFV)[30]		In-kind/voucher	Health Agriculture Markets Social Protection

Children 6-23 months

Figure 30 shows that both nutritious fresh and fortified foods reduced the cost of a nutritious diet for a child aged 6-23 months. The FFV and MNP had a similar impact and reduced the cost 10 to 17 percent. The MCHN programme, through the provision of SC+, had the greatest impact in improving access to essential nutrients and reduced the cost of a nutritious diet by 56 percent.

[26] Provision of Supercereal, oil and sugar
[27] Assumed a yield of 3.3kg per month (total) of biofortified beans, dodo leaves, pumpkin, pumpkin leaves and swiss chard
[28] Provision of four chickens that, in total, lay three eggs a day
[29] Assumed households would consume 2 rabbits a month
[30] Provision of 12 eggs and 1kg dodo leaves per week for households with a child under 2 years, adolescent girl or a PLW

Figure 30. The daily cost of a nutritious diet in RWF for a child 6-23 months with interventions to improve access to nutrients as proposed by stakeholders.



School Aged Child

Figure 31 and 32 show the impact of the current ECD programme and a range of nutrition sensitive options on reducing the cost of a nutritious diet for a 4-5 year old (to represent a 3-5 year old enrolled in the ECD programme) and a 6-7 years old (to represent a school aged child).

The ECD programme currently implemented by WFP with Supercereal and sugar reduces the cost of a nutritious diet by an average of 16 and 14 percent for a 4-5 year old and 6-7 year old respectively. This cost can be brought down by a further 11 percentage points if milk, dried fish, fruit and vegetables are also included.

Figure 31. The daily cost of a nutritious diet in RWF for a school child aged 4-5 years with the current ECD programme and nutrition sensitive school meal options to improve access to nutrients as proposed by stakeholders.

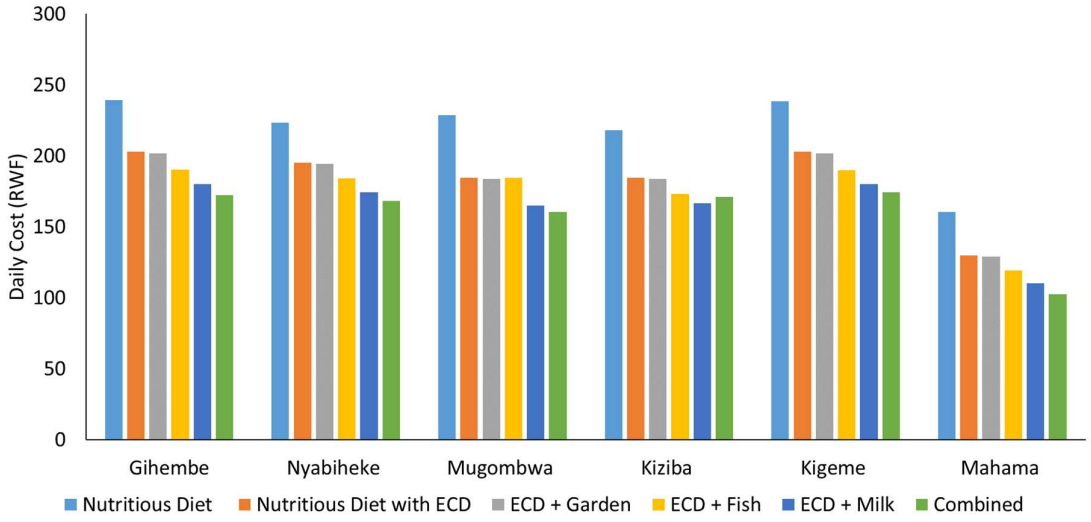


Figure 32. The daily cost of a nutritious diet in RWF for a school child aged 6-7 years with the current ECD programme and nutrition sensitive school meal options to improve access to nutrients as proposed by stakeholders.

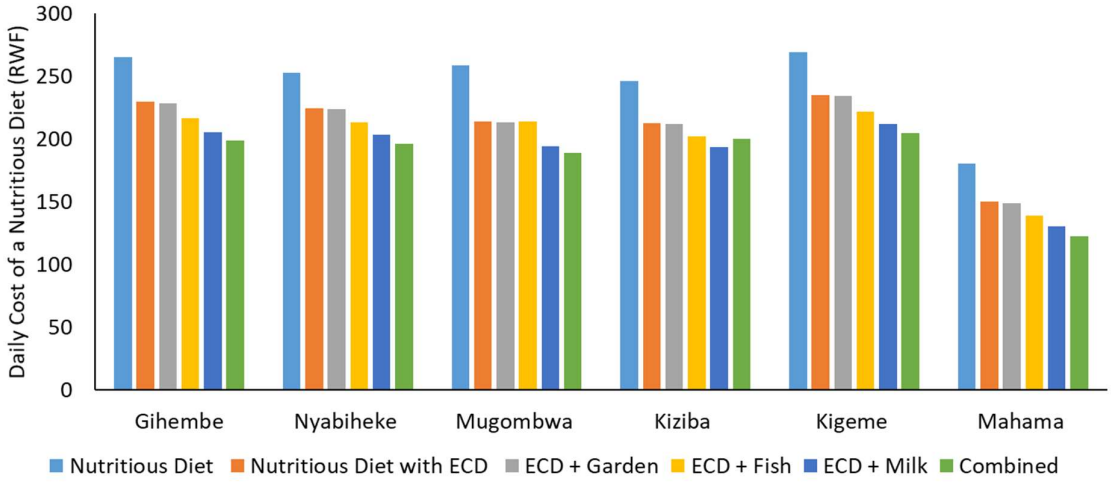


Figure 33 and 34 show the percentage of nutrient requirements met by the different elements of the nutrition sensitive school meals for the child aged 4-5 years and 6-7 years. The black line represents indicative recommended nutrient requirements based upon the assumption that a school meal should be one of three meals in the day and should therefore meet at least a third of requirements. The current ECD programme of SuperCereal and sugar provides an important contribution of essential vitamins and minerals but is low in energy, fat and vitamin B1. The addition of two cups of milk and a

portion of dried fish a week would improve the meal's content of these nutrients but not enough to meet a third of requirements. Milk and fish also make an important contribution to vitamin B12, iron and calcium requirements. The fruit and vegetables from school gardens make a limited contribution to the meal's nutrient content because they were included in very small amounts. Data on the potential yields of these foods from such an intervention were not available and thus conservative estimates were made.

Figure 33. The percentage nutrient requirements of a 4-5 year old met by the ECD programme with the addition of milk, dried fish, fruit and vegetables. The black line represents the indicative recommended requirements that should be met by a school meal.

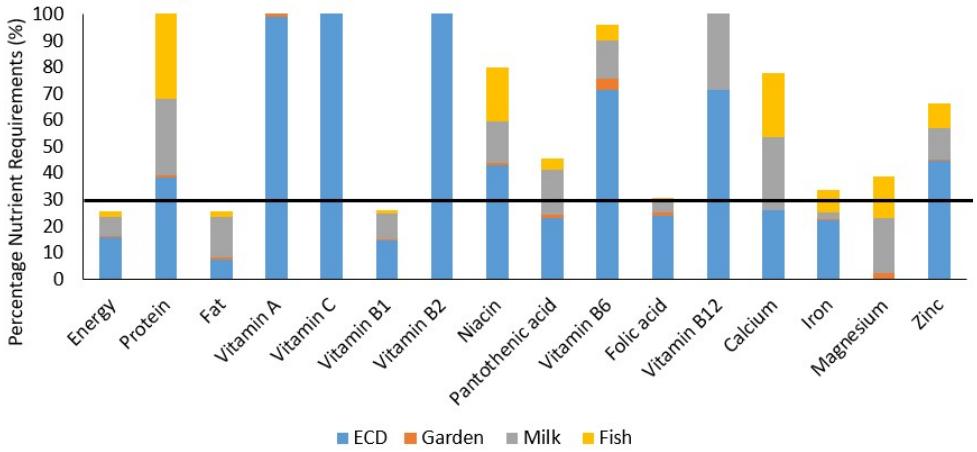
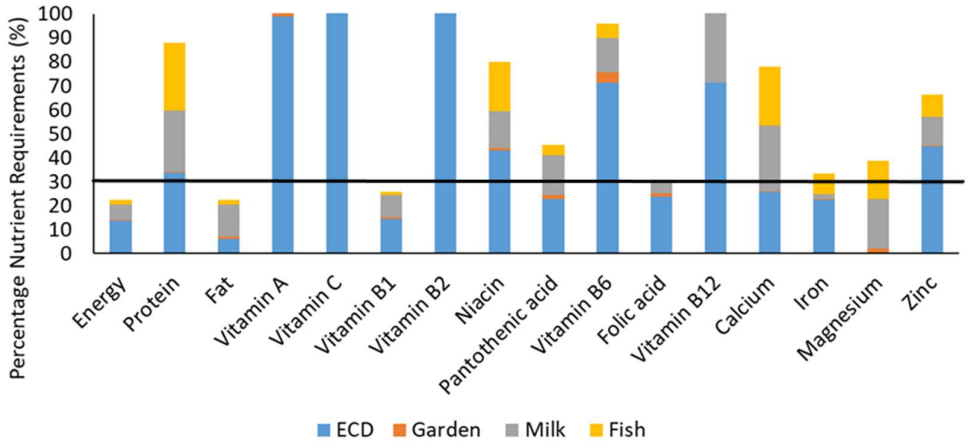


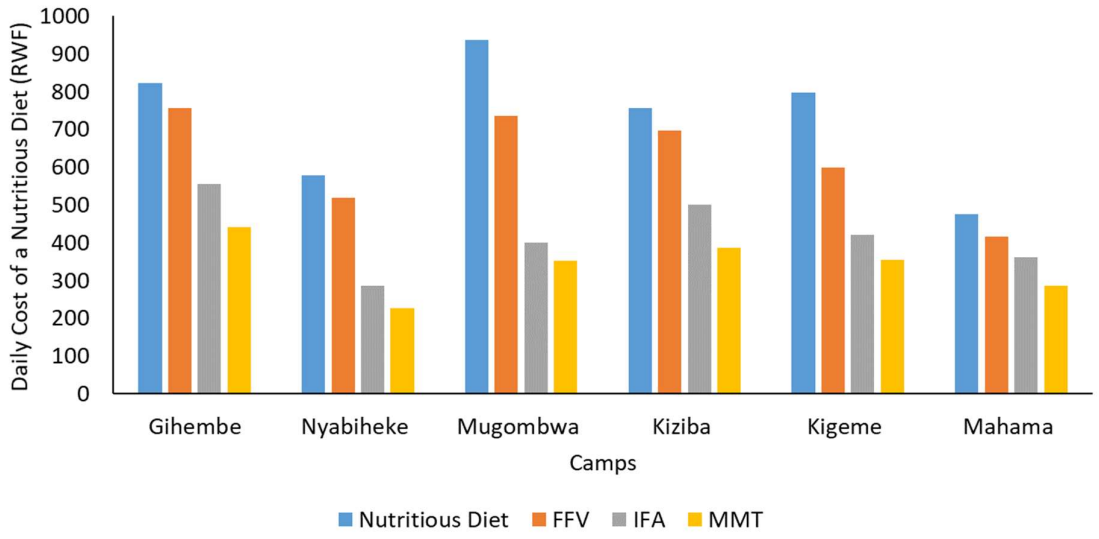
Figure 34. The percentage nutrient requirements of a 6-7 year old met by the ECD programme with the addition of milk, dried fish, fruit and vegetables. The black line represents the indicative recommended requirements that should be met by a school meal.



Adolescent Girl

For an adolescent girl, both fresh and fortified foods reduced her cost of a nutritious diet. A FFV reduced the cost by 14 percent whilst an IFA reduced the cost by 40 percent. A MMT was the most effective at improving access to essential nutrients for this target group and reduced the cost of their diet by 52 percent (Figure 35).

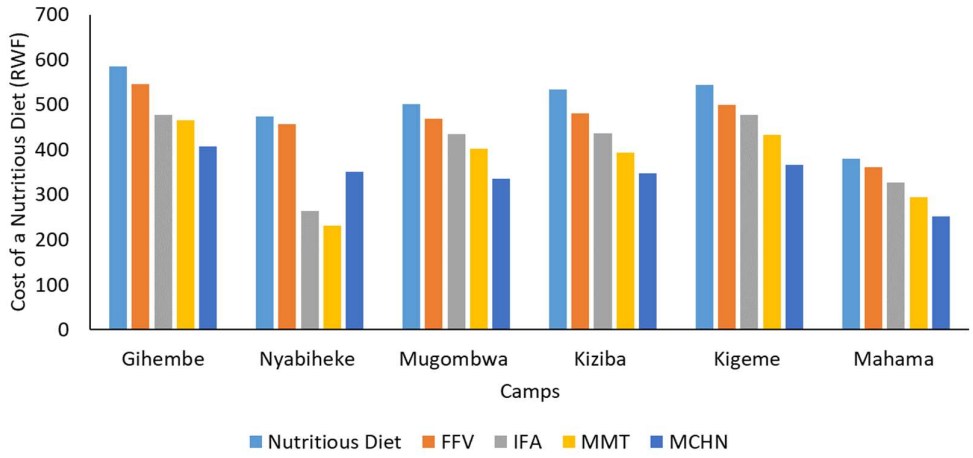
Figure 35. The daily cost of a nutritious diet in RWF for an adolescent girl with interventions to improve access to nutrients as proposed by stakeholders.



PLW

The CotD results (Figure 36) for the PLW emphasise the importance of fortified food or supplements for this target group, to improve access to essential nutrients. The FFV makes some contribution to reducing the cost of the nutritious diet, by 7 percent. However, the IFA, MMT and SuperCereal have the potential to reduce the cost of a nutritious diet by 20 to 32 percent. SuperCereal in all but one camp (Nyabiheke) had the greatest impact on improving access to essential nutrients. It is likely that iron is a limiting and thus expensive nutrient to meet requirements for in Nyabiheke camp. Therefore, a larger dose through supplementation is likely to contribute to the greater impact on the cost of a nutritious diet as compared to Supercereal from the MCHN programme.

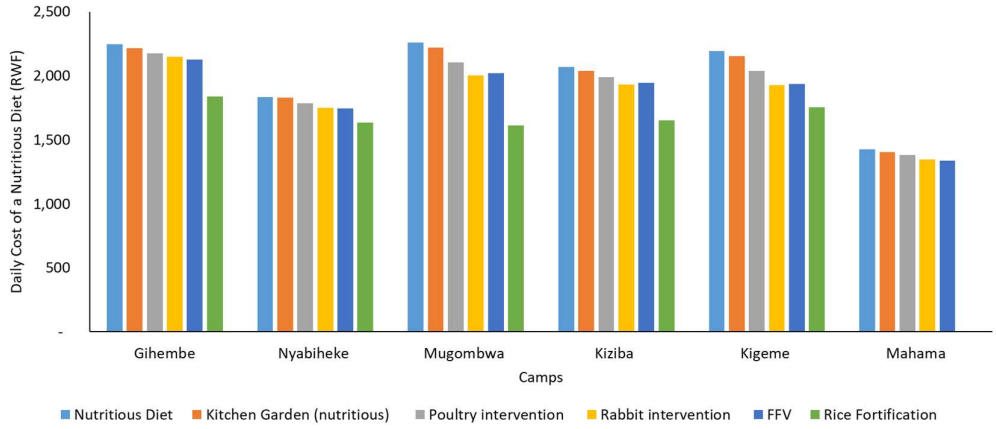
Figure 36. The daily cost of a nutritious diet in RWF for a PLW with interventions to improve access to nutrients as proposed by stakeholders.



Household

For the household, all interventions made some contribution to reducing the cost of a nutritious diet (Figure 37). Fortified rice available at the market at a 2 percent higher cost than unfortified rice in the Congolese camps reduced the cost of a nutritious diet the most, by 20 percent. In Mahama camp, fresh food vouchers had the greatest impact but only reduced the cost of a nutritious diet by 6 percent. The nutrition sensitive agriculture and small poultry and livestock interventions had a lower impact on reducing the cost of a nutritious diet and did so by up to 8 percent. There was very little yield data available for these interventions and thus conservative estimations were made, which explains why their impact was much lower compared to fortified rice.

Figure 37. The daily cost of a nutritious diet in RWF for a household with interventions to improve access to nutrients as proposed by stakeholders.



Intervention Packages

8. A package of interventions implemented across multiple sector(s) entry points could greatly improve household's economic capacity to purchase a nutritious diet.

The most effective interventions for reducing the cost of meeting nutrient intakes for individual target groups were combined into packages, as shown in Table 3.

Table 3: The targeted and household interventions most effective at reducing the cost of a nutritious diet

Camp	Target Group	Intervention
Mahama camp	Child 6–23 months	MCHN
	School Aged Child	Nutrition-Sensitive School Meal
	Adolescent Girl and PLW	MMT
	Household	Fresh food vouchers
		General Food Assistance
Congolese camps	Child 6–23 months	MCHN
	School Aged Child	Nutrition-Sensitive School Meal
	Adolescent Girl and PLW	MMT
	Household	Fortified rice
		Fresh food vouchers
		WFP Cash Transfer

Figures 38 and 39 summarize the impact these interventions - combined with others into a package - could have on reducing the cost of a nutritious diet for the modelled five person household. In Mahama camp, this cost could be reduced by as much as 86 percent and in the Congolese cash camps by between 59 and 89 percent. These results demonstrate the possible benefits that could be gained by increasing refugee's nutrient access via a package of interventions across multiple entry points and sectors. The underlying assumption for such an intervention is that adequate demand creation

strategies and mechanisms to ensure redemption of vouchers for eligible foods are in place to ensure that any cash transfers or vouchers provided would be spent on nutritious food.

Figure 38. The potential impact that a package of targeted household level interventions could have on reducing the cost of a nutritious diet in Mahama camp.

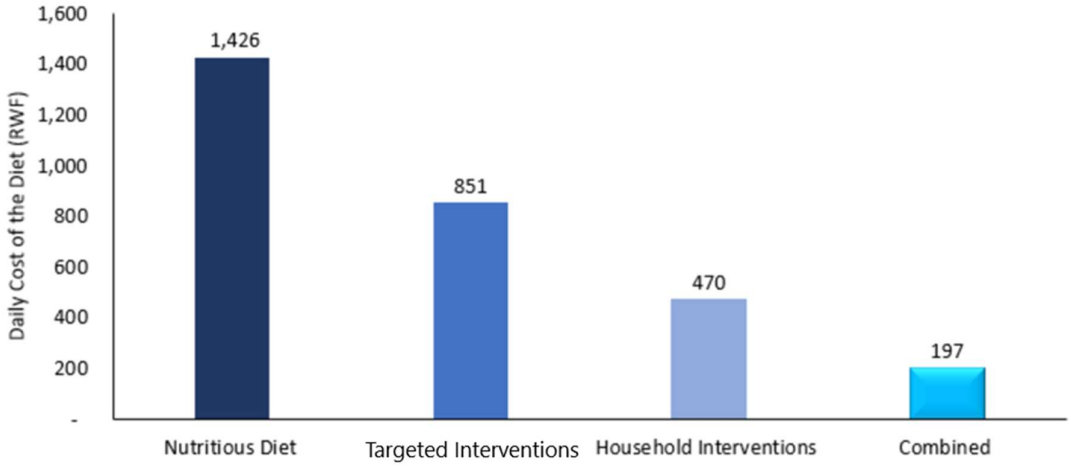
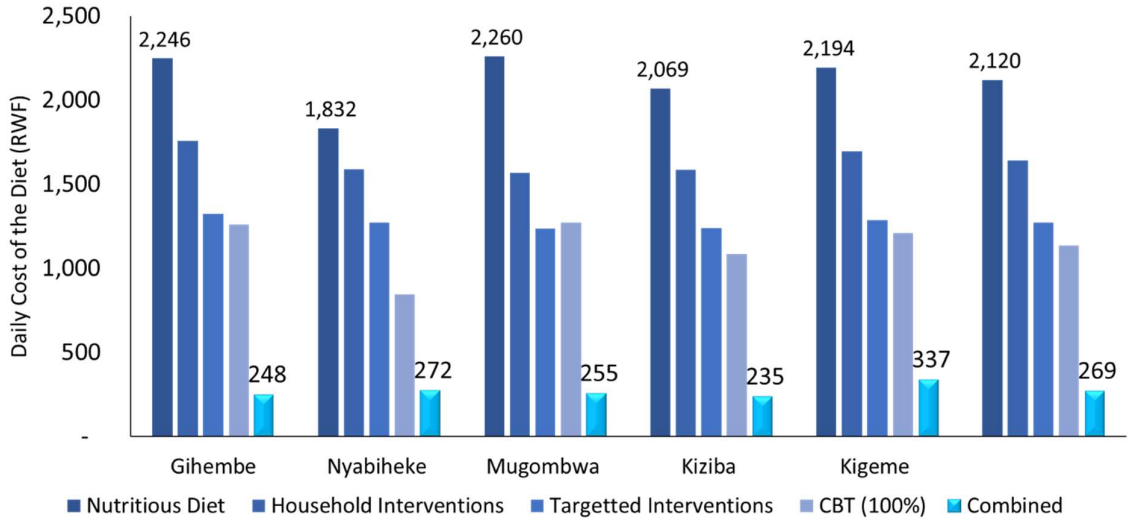


Figure 39. The potential impact that a package of targeted household level interventions could have on reducing the cost of a nutritious diet in the Congolese cash camps.



Recommendations

During the dissemination workshop hosted by UNHCR and attended by the wider stakeholder group working within the refugee context, the main findings of the FNG analysis were shared and discussed with the participants to formulate recommendations. Participants then formed five work groups, each focused on a different target group – children under 2 years; children 2-9 years; adolescent girls; pregnant and lactating women, and households.

Each group was asked to identify and then prioritize the issues for their target group as identified by the FNG analysis. They were then asked to brainstorm ideas for interventions that would address the issues they had prioritized. During this section of the group work they had to list existing interventions, improvements to existing interventions, and new interventions from different sectors including agriculture, health/nutrition, WASH, education, social protection, gender, private sector and livelihoods.

After this exercise, participants were asked to select a package from these interventions that would address the issues they prioritized for their target group. They were required to discuss the linkages that could exist between their chosen interventions and ensure that their package included interventions from at least three sectors. Finally, they were asked to identify the enabling environment required for their package to be successful. They had to consider the following - policy and strategy frameworks; coordination and synergies across sectors; resources; advocacy; and data gaps.

The following sections outline the priority issues as identified by stakeholders, and the recommendations for interventions and the enabling environment.

Priority Issues

Nutritionally vulnerable target groups:

1. Children under 5 years - high prevalence of stunting and anaemia;
2. Children aged 6-23 months - low attainment of timely introduction of complementary foods and MAD;
3. Adolescent girls - high rates of pregnancy[31] and lack of targeted nutrition interventions;

[31] The information was not found through secondary data but was mentioned anecdotally by stakeholders. Specific numbers are not available.

4. Pregnant women - low attendance at antenatal care and low enrolment in the MCHN programme, especially in Mugombwa.

Household:

5. Limited livelihood and income earning opportunities.
6. Unmet non-food needs.
7. Unintended use of resources (food assistance) provided.
8. Limited access to, and low consumption of, high iron (animal source) foods.
9. Limited access to nutrition counselling sessions or a resistance to nutrition messages due to cultural practices and beliefs.

Recommended Interventions

School based interventions

- Develop a nutrition curriculum to be delivered to all age groups in schools.
- Run after/out-of-school clubs for adolescent boys and girls which engage them on topics such as nutrition, child care, gender, food safety, hygiene and sanitation, and sexual and reproductive health.
- Use school meals as a platform to create demand for nutritious foods. Suggestions included:
    - Including MNPs in school meals in the short term to improve micronutrient density;
    - Scaling up the One Cup of Milk per Child programme to schools in refugee communities, linking to host population families who are enrolled in the GIRINKA[32] programme;
    - Working with the private sector to provide a fortified food that could be included in school meals;
    - Linking with smallholder animal and vegetable producers in the host community to supply schools with fresh, nutritious foods (especially milk, eggs, dodo leaves, iron rich biofortified beans and orange flesh sweet potatoes);
    - Including a strong component of WASH in schools to ensure meals are prepared safely and providing hand washing facilities to prevent illness.
- Use schools as a platform to collect nutrition and health data on adolescents.
- Use schools and after/out of school clubs as a platform to deliver MMTs or iron and folic acid tablets to adolescent girls.

[32] One cow per household programme.

Agriculture and other livelihood activities

- Scale up an integrated package of improved smallholder livestock and kitchen garden interventions with a focus on eggs, milk and high iron vegetables combined with a strong component of nutrition and WASH education. Suggestions included:
    - Use innovative methods to maximise space (e.g. vertical gardening), and prioritize iron- and vitamin A-rich crops such as dodo leaves and biofortified high-iron beans.
    - Invest in, and improve access to, water and irrigation to make kitchen gardens also viable during the dry season.
- Implement programmes that optimize agricultural land and livestock by integrating the resources of refugee and host communities and ensuring products are equally shared.
- Link livelihood activities to child friendly spaces or Early Child Development centres and ensure that nutritious foods are given to children enrolled in these programmes.
- Conduct research on gaps in the employment market and invest in vocational training curricula for refugees to fill these gaps. Provide cash grants after training to enable refugee men and women to set up businesses or invest in their livelihood activities. Vocational training should also be offered to adolescent girls and boys who drop out of school.

Nutrition education

- Adapt nutrition messages (currently, only included in health sector activities) to other target groups and integrate them into agriculture, social protection and WASH activities.
- Expand mother-to-mother support group programmes to include groups specifically for adolescent girls (i.e. girl–to-girl group programme).
- Engage local leaders or religious figures to encourage men to attend nutrition education sessions and to engage in design and dissemination of messages, particularly those related to men taking an active role in domestic work (including small livestock and kitchen gardens) and child care.
- Find male champions who support their wives in domestic chores and child care, who believe in making decisions equally, and who can act as male change agents in the community.

Recommended Enabling Environment

Policy and Strategy Frameworks

- Develop a long-term strategy that enables refugees to move from assistance dependence to self-reliance
- Renew government commitment to the Comprehensive Refugee Response Framework.
- Continue investment and implementation of UNHCR's Economic Inclusion of Refugees Strategy.

Coordination and Synergies across Agencies and Sectors

- Improve the coordination between health, education, WASH, gender and social protection sectors.
- Ensure nutrition messages are tailored to different target groups and integrated into other sector programmes.

Resources

- Ensure health centres have continuous stock of iron and folic acid tablets.
- Build capacity of health staff, teachers, agriculture extension workers and WASH sector staff in nutrition.

Advocacy

- Use the FNG results on consequences of ration cuts to advocate to donors for consistency and adequate level of funding for general food assistance.
- Sensitise the refugee and host community about refugees right to work in Rwanda.

Data Gaps

- The drivers of high anaemia in camps, particularly among underfives.
- What nutritious, fresh foods are available in the markets that serve the refugees and whether supply could respond to an increase in demand (e.g. through increased use in school meals or as the result of behaviour change messaging).
- The reasons for low attainment of timely introduction of complementary feeding in camps.
- The reasons for fluctuations in the attainment of MAD in camps between 2016 and 2018.
- Percentage of children achieving Minimum Dietary Diversity.
- Women's BMI by age (non pregnant).
- Women's age at first birth and at marriage.
- Whether and how the diets of women change when they are pregnant or breastfeeding.

- An understanding of whether income figures for refugees include money that is earned by selling food assistance.
- Gaps in the employment market (beyond agriculture) in refugee and host communities, which could be filled by trained refugees.

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Annex 1: Stakeholder Consultations for Fill the Nutrient Gap

The partners listed below were involved throughout the FNG process and took part in both the inception and dissemination meetings.

- MIDIMAR
- UNHCR
- UNICEF
- Save the Children
- Plan International
- American Refugee Committee
- AHA

Annex 2: Refugee Modelling Plan

Intervention	Target Group	Transfer Modality	Entry Point(s)
Multiple Micronutrient Powder	Child 6–23 months	In-kind/voucher	Health Social Protection
Maternal Child Health and Nutrition programme (SuperCereal Plus)			
Nutrition Sensitive School Meals	School Aged Child	In-kind	Education
Iron Folic Acid Supplement	Adolescent PLW	In-kind/voucher	Health Social Protection
Multiple Micronutrient Tablet			
Maternal Child Health and Nutrition programme (SuperCereal, oil and sugar)			
Nutrition-Sensitive Kitchen Gardens	Household	Own Production	Agriculture Markets
Smallholder Poultry Intervention			
Smallholder Rabbit Intervention			
Fortified Rice (Congolese Cash Camps only)		Market	Markets
Fresh Food Vouchers		In-kind/voucher	Health Agriculture Markets Social Protection

Annex 3: The Nutrient Composition per 100g of Foods or Supplements used in CotD Modelling

Fortified Blended Foods

Nutrients	Units	Super Cereal (SC)	Super Cereal Plus (SC+)
Energy	kcal	380	400
Protein	g	14	16
Fat	g	6	10
Vitamin A	mcg RE	1039	793
Thiamin B1	mg	0.2	1
Riboflavin B2	mg	1.4	1
Niacin B3	mg	8	8
Vitamin B6	mg	1	1
Vitamin B12	mcg	2	1
Vitamin C	mg	90	60
Vitamin D	mcg		10
Vitamin E	mg		10
Folate B-9	mcg DFE	110	160
Vitamin K	mcg		30
Pantothenic acid B-5	mg	1.6	4
Biotin B-7	mcg		12
Calcium	mg	362	800
Copper	mg		
Iodine	mcg		90
Iron	mg	6.5	23
Magnesium	mg		108
Manganese	mg		1
Phosphorus	mg	280	940
Potassium	mg	140	773
Selenium	mcg		15
Sodium	mg		
Zinc	mg	5	17

Supplements and Home Fortificants per 100 g

Nutrients	MNP	MMT	IFA (Adolescent Girl)	IFA (PLW)
Energy (kcal)				
Protein (g)				
Fats (g)				
Saturated Fat (g)				
Monounsaturated Fat (g)				
Polyunsaturated Fat (g)				
Carbohydrate (g)				
Fiber (g)				
Phytate (mg)				
RAE (ug retinol)	40,000	80,000		
Vit C (mg)	3,000	7,000		
B1 (mg)	50	140		
B2 (mg)	50	140		
Niacin (mg)	600	1,800		
B6 (mg)	50	190		
Folate (mcg)	15,000	66,667	46,667	66,667
B12 (mcg)	90	260		
Pantothenic Acid (mg)				
Calcium (mg)				
Copper (mg)	56	200		
Iron (mg)	1,000	3,000	6,000	6,000
Magnesium (mg)	-	-		
Zinc (mg)	410	1,500		

Fortified and Biofortified Foods per 100 g

Nutrients	Fortified Rice	Biofortified High Iron Beans
Energy (kcal)	358	343.0
Protein (g)	6.5	22.7
Fats (g)	0.52	1.6
RAE (ug retinol)	150	463.0
Vit C (mg)	0	0.0
B1 (mg)	0.5	0.2
B2 (mg)	0.05	134.0
Niacin (mg)	7	8.6
B6 (mg)	0.6	45.0
Folate (mcg)	216.67	3.0
B12 (mcg)	1	62.4
Pantothenic Acid (mg)	1.29	0.3
Calcium (mg)	3	0.1
Copper (mg)	0.21	0.6
Iron (mg)	4	15.5
Magnesium (mg)	23	617.0
Manganese (mcg)	1.04	0.2
Phosphorous (mg)	95	142.0
Potassium (mg)	76	403.0
Sodium (mg)	1	0.5
Zinc (mg)	6	2.0

Annex 4: Underlying Assumptions Made for CotD Modelling

Modality	Intervention	Target Group	Dosage (g)	Frequency	Price/100g
Voucher or in-kind	MNP	U2	1	Three times a week	0
	IFA	Adolescent Girl and PLW	1	Adolescent Girl: Once a week PLW: Once a day	0
	MMT		1	Once a day	0
	Fresh Food Voucher	Household[33]	Eggs: 1 dozen per week Dodo leaves: 1kg a week	Once a week	0
Market	Fortified Rice (Congolese Camps only)		Same unfortified rice as defined by CotD software	Up to 3 times a day	2 percent higher than unfortified rice
Own production	Nutrition Sensitive Kitchen Garden		Total yield of 3.3 kg a month of per month (total) of biofortified beans, dodo leaves, pumpkin, pumpkin leaves and swiss chard	A month	0
	Poultry Intervention		21 eggs	A week	0
	Rabbit Intervention		2 rabbits	A month	0

[33] Foods distributed to each household member proportionate the energy needs.

Maternal and Child Health Programme Models

Intervention	Individual	Commodity	Portion Size (G)	Frequency
MCHN for children under 2 years[34]	U2	SuperCereal Plus (200 g/d)	60	Daily
	School Aged Child		15	
	Adolescent Girl		29	
	PLW		43	
	Man		52	
MCHN for PLW[31]	PLW	SuperCereal (229 g/d)	120	
	U2		11	
	School Aged Child		22	
	Adolescent Girl		27	
	Man		49	
	PLW	Oil (25 g/d)	8	
	U2		1	
	School Aged Child		3	
	Adolescent Girl		5	
	Man		9	
	PLW	Sugar (15 g/d)	5	
	U2		1	
	School Aged Child		2	
	Adolescent Girl		3	
	Man		5	

[34] Portion size of SuperCereal Plus and Supercereal provided to targeted beneficiaries based upon the optimal amount required for software optimisation. The remainded is distributed to the other household members based upon proportionate energy needs.

Nutrition Sensitive School Feeding

	Intervention					
Food/ Supplement	**School Milk**	**Ration 1**	**Ration 1 + Milk**	**Ration 1 + School Garden**	**Ration 1 + Fish Pond**	**Ration 1 + Fresh Foods Combined**
SuperCereal		120g/day				
Sugar		15g/day				
Milk	1 litre/week		1 litre/week			1 litre/week
Cabbage				For each, 15g/week		For each, 15g/week
Carrots						
Bananas						
Avocados						
Fish					60g/week	60g/week

General Food Assistance Models

In Kind Food Distribution (amounts are grams per week)[30]

	100 percent				90 percent				75 percent			
	Maize grain	**Beans**	**Vit A fortified oil**	**Super Cereal**	**Maize grain**	**Beans**	**Vit A fortified oil**	**Super Cereal**	**Maize grain**	**Beans**	**Vit A fortified oil**	**Super Cereal**
Child under two	621	207	9	86	559	186	8	78	466	155	6	65
School-aged child	1,241	414	17	172	1,117	372	16	155	931	310	13	129
Adolescent girl	2,483	828	34	345	2,234	745	31	310	1,862	621	26	259
Woman	3,724	1,241	52	517	3,352	1,117	47	466	2,793	931	39	388
Man	4,345	1,448	60	603	3,910	1,303	54	543	3,259	1,086	45	453
Total	**12,414**	**4,138**	**172**	**1,724**	**11,172**	**1,552**	**3,742**	**155**	**9,310**	**3,103**	**129**	**1,293**

Cash Transfer Values

Target group	Amount per person per day (RWF)	Amount per family of 5 per day (RWF)	Amount per family of 5 per month assuming 79 percent expenditure for food
100 percent	250	1,250	987
90 percent	225	1,125	888
75 percent	188	937	740

Complementary Feeding Recipes

Recipe	Food	Portion size (g)	Frequency	Total price of recipe
Inombe y'ibirayi irimo Soya (Potato with dodo leaves, tomatoes, small fish and soybeans)	Irish potato	210	Once a day	Kigali: 172
	Dodo	30		Southern Rural: 122
	Tomato	30		West Rural: 136
	Small fresh fish	30		North rural: 120
	Soybeans	30		East rural: 120
Inombe y'igitoki, imboga n'indagara/ifi (Matoke with dodo leaves, tomatoes and small fish)	Matoke	210	Once a day	Kigali: 185
	Dodo	30		Southern Rural: 130
	Tomato	30		West Rural: 134
	Small fresh fish	30		North rural: 117
				East rural: 121
Umutsima w'ibigori, Ibishyimbo bivanze n'imboga n'indagara (Maize, beans, dodo leaves and dried fish)	Maize grain or flour	60	Once a day	Kigali: 77
	Beans	30		Southern Rural: 83
	Dodo	30		West Rural: 97
	Dried fish	30		North rural: 89
				East rural: 68