

between the age a woman was married and stunting in her children due to limitations of the study. The child protection team required that ages were categorised during data collection, which made it impossible to perform an analysis of the association. There is, however, considerable research that substantiates this link. Adolescent girls are at risk of poor nutrition (in particular anaemia), which increases the risk of their infants having low birth weight, which in turn increases the risk of the infant being stunted in childhood (Soo Hyun Yu, 2016). To date, there has been little scrutiny or research into the relationship between child marriage in northwest Syria and its consequences for adolescent and child health. This is an area that needs more attention to inform interventions.

Conclusions

The nutrition situation in northwest Syria is unique, with high – and, in some areas, increasing – levels of child stunting, alongside declining acute wasting. Reports from NGOs also report increasing rates of child marriage related to the conflict, high levels of which were confirmed in the SMART survey reported here.

Unfortunately, the design of the SMART nutrition survey 2019 did not allow examination of the associations between child marriage and child stunting. Further analysis of the association between child marriage and stunting of subsequent children is warranted, with a better-designed survey to capture the data needed. While we did not statistically confirm the association between child stunting and child marriage, we believe that only a holistic approach can prevent chronic malnutrition and that child protection is a fundamental component that needs to be addressed in this context.

Given this, from July 2019 UNICEF for northwest Syria has been supporting partners to implement an integrated health, nutrition (community-based management of acute malnutrition and IYCF), and child protection (including disability) programme response. Work is ongoing to find ways for the nutrition programme to support the identification of child protection cases, using the nutrition-screening programme as one of the entry points to detect cases of family abuse/violence; this information could enable the instigation of measures to pre-

vent child marriage. Educational programmes may provide another entry point to change community behaviours that sustain child marriage; in particular, to discourage child marriage as a negative coping mechanism for war. Social protection networks for the most vulnerable families and adolescent health programmes are also essential in preventing malnutrition.

To improve the overall nutrition situation, nutrition-specific field interventions aiming to address the immediate causes of undernutrition should be prioritised. Additional supporting mechanisms (such as cash transfers to stimulate adequate and diverse diets, and continuous promotion of optimal IYCF and practices and nutrition behaviours for PLW) should remain core, integrated emergency-response interventions.

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Cost of the Diet analysis in Bria, Central African Republic

By Esther Busquet



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One of the CotD data collectors weighing sweet potato on the market, Market, Bria, Haute Kotto, CAR

Location: Central African Republic (CAR)

What we know: Dietary habits and food costs are key determinants of a household's capacity to meet energy and nutrition needs.

What this article adds: A Cost of the Diet (CotD) study was carried out among internally displaced persons (IDPs) and host communities of Bria Town and PK3 IDP camp in Haute Kotto region of CAR in November 2018 to determine whether communities could meet energy and nutrient requirements through food assistance (20-day ration) and purchases of locally-available foods. Results show that, for a typical family of nine, a 'nutritious diet' and a 'food habits nutritious diet' (meets energy and nutrient requirements and is acceptable) are both available in the rainy season. However, for poor and very poor families, even meeting basic energy needs is unaffordable. Extending food rations to 30 days, plus the provision of free vegetables (through kitchen gardens and other possible means), would make all diets affordable to all wealth groups. Multisector collaboration and advocacy, including military support for access to insecure areas, is needed to enable this.

Background

In Central African Republic (CAR) an estimated 2.9 million out of a population of 4.6 million currently require humanitarian support. Results of the 2018 SMART survey show a global acute malnutrition (GAM) prevalence of 7.5% and severe acute malnutrition (SAM) prevalence of 2.7% for Haute Kotto region. Aggravating factors include insecurity, food insecurity, high numbers of internally displaced persons (IDPs) in camps and host communities, and poor infant and young child feeding (IYCF) practices. In sites with a high number of IDPs (Alindao, Bambari, Bria, Kaga Bandoro, Batangafo), most households have limited access to land to engage in agricultural activities and are dependent on humanitarian food assistance and food-market purchases. Food



Some of the foods available in Bornou market at the time of the CotD, Bornou Market, Bria, Haute Kotto, CAR, November 2018

and nutrition support are available but patchy due to insecurity and transportation difficulties to the affected areas, and humanitarian food assistance remains inconsistent and underfunded.¹ As a result, food-consumption deficits and poor nutrition among IDPS, returnees and host communities are common. The current food-security situation is classified by the Integrated Phase Classification (IPC) as level 3, crisis.

Bria Town is the capital of Haute Kotto region and the hub of the diamond business in eastern CAR. A series of violent clashes took place in Bria in May 2017 between the FRPC² (commonly called ex-Seleka) and the anti-balaka militia (commonly called Christian militia), resulting in the majority of the resident population moving into PK3 IDP camp,³ just outside the town. The host community and IDPs, resident in either Bria Town or PK3 IDP camp,³ now receive the general food distribution (GFD). Rations provided are for 20 days per month per person by World Food Programme (WFP); insecurity limits the amount of food that can be brought into the region, which hinders the supply of a full 30-day ration. According to the results of International Medical Corps (IMC)'s rapid assessment (RA) in May 2017, in all sites visited, the main sources of foods were the GFD and local markets, which are accessible most of the time. Culturally, it is considered to be the responsibility of the head of the household to provide food for household members. RA focus group discussions (FGDs) revealed that households do not have access to their land to produce the foods typically farmed pre-crisis (cassava, rice and beans), and thus no longer have food stored. This has been exacerbated by the increase in market food prices

during the crisis, with some products, such as sugar, oil and soap, now being very expensive. Tubers, legumes, dairy products, meat and fish, eggs, fruits rich in vitamin A and other vegetables were available in the markets in all sites visited during the needs assessment. However, dairy, meat and fish, and fruit rich in vitamin A were expensive and probably not affordable to most households.

IMC manages primary healthcare, community-based management of acute malnutrition (CMAM) and IYCF and protection programmes in Bria Town and PK3 camp. On the basis of the findings above, to inform future potential food-security activities, IMC conducted a Cost of the Diet (CotD) study to understand if and how IDPs and the host community can meet their energy and nutrient requirements. The ultimate aim of the study was to inform nutrition and food security programming in the area, and influence policy and advocacy processes in this and other similar contexts. Since October 2018 people resident in both the town and camp had access to the same markets, whereas previously IDPs only had access to a smaller market in the camp, with fewer foods available and at higher prices. Thus, the CotD study included both groups.

Study objectives

A CotD study aims to estimate the lowest cost and the quantity and combination of local foods that are needed to provide a typical family with foods that meet their average needs for energy and their recommended intakes of protein, fat and micronutrients. The specific objectives of this CotD study were to: (1) understand the

extent to which economic poverty and typical dietary habits prevent households and vulnerable individuals from consuming a nutritious diet in Bria Town and PK3 IDP camp; and (2) understand if and how IDPs in settings such as Bria Town and PK3 camp can meet energy and nutrient requirements using locally-available foods.

Methodology

CotD training was conducted for nutrition and MEAL⁴ managers in CotD methodology and software (18-26 October 2018). Data collectors in Bria were trained from 31 October to 2 November 2018 and data collection took place between 3 and 9 November 2018. The study involved a market survey, individual interviews and FGDs. The market survey collected data on all food items available in the town's markets, as well as through own food production and wild foods. The price per 100 grams of each food was determined (based on the cost of the lowest-available quantity of each food item). For wild foods, usually gathered at no cost, and foods from own production, the market price was used if the food was sold on the market, and no cost was included if it was not sold on the markets. The composition of several wild foods (mainly fruits) was unknown, so they were not included in the CotD analysis; however, none of these foods were actually available at the time of the study. Individual interviews were conducted with 24 women from several parts of the town and camp to determine the minimum and maximum frequency with which each of these foods was consumed per week. FGDs with the same women helped to generate a better understanding of dietary habits in Bria Town and PK3 IDP camp. Three groups of eight women each participated in the interviews and FGDs; one group from Amameu (PK3 camp), one group from Bornou, and one group from Lasmie (Bria Centre). The groups included adult women from the different wealth groups, as defined by Oxfam's household economy approach (HEA) (Garba, 2015), who were in charge of the household and preparation of meals.

¹ FEWSNET CAR <https://fews.net/west-africa/central-african-republic>

² FRPC = Front Populaire pour la Renaissance de la Centrafrique.

³ PK3 IDP Camp is managed by the Italian non-governmental organisation INTERSOS with funding from United Nations High Commission for Refugees (UNHCR).

⁴ MEAL = Monitoring, evaluation, accountability and learning

Table 1 Percentage of the population of Bria Town per wealth group and family size in Bria Town and PK3 camp per wealth group

Wealth group	Bria Town		PK3 IDP camp*
	Percentage of Population	Family size	Family size
Very poor	40%	3 – 5	2 – 5
Poor	30%	5 – 8	5 – 8
Middle	20%	12 – 15	9 – 12
Better-off	10%	~ 20	--
	100%	'average' ~ 9	

* Percentage of each wealth group among the population in the camp is unknown, but is probably very similar to the percentages for the town, as most IDPs came from Bria Town

Table 2 Details of the lowest-cost nutritious diet and food habits diet for a typical family of nine in Bria Town and PK3 IDP camp in the rainy season

Nutritious diet	Food habits diet
Total of 12 different foods (max 8pp) from 6 food groups (plus breastmilk)	Total of 17 different foods from eight different food groups, including breastmilk
Most difficult nutrients to meet: vitamin B12 and pantothenic acid (contributing relatively most to the total costs of the diet)	Most difficult nutrients to meet: vitamin B12 and pantothenic acid
Out of reach for majority of people, even if the entire salary is used to purchase foods	Even further out of reach for very poor, poor and middle-income families

Figure 1 Diet costs compared to monthly income for a typical family of nine in Bria in the rainy season

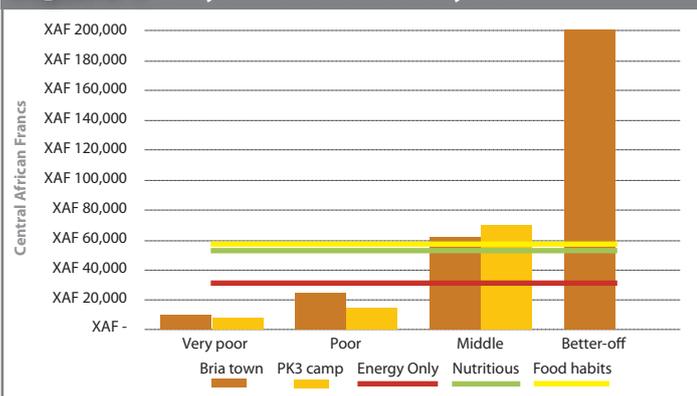
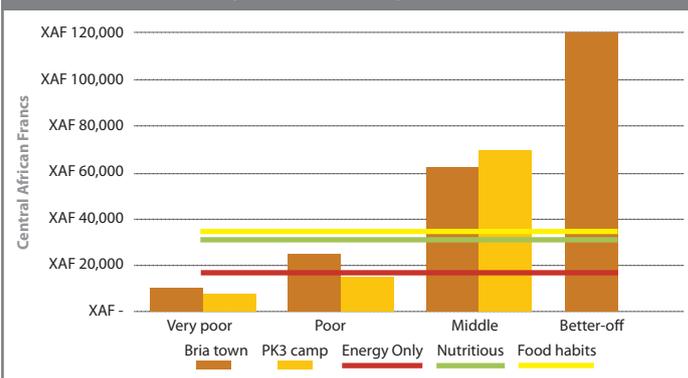


Figure 2 Cost of the diets when a 20-day food basket is provided each month in Bria Town and PK3 camp in the rainy season (current situation)



Based on the information collected, various diets were then calculated using the CotD software, as follows:

- **Energy-only diet:** diet that only meets energy requirements and does not meet (or aim to meet) any nutrient requirements. This is used as a basis for comparison with certain food distribution and food-security programmes;
- **Nutritious diet:** diet that meets requirements for energy, macro- and micronutrients, but does not take into account any dietary habits;
- **Food habits nutritious diet:** diet that meets the requirements for energy, macro- and micronutrients, and takes into account dietary habits.

Based on information from the Oxfam HEA and FGDs with both the data collectors and the women participating in interviews, typical household composition, percentage of the population

per wealth group and average income in both Bria Town and PK3 camp (Table 1) were estimated. A typical family in Bria was found to include nine people. This estimation was used for practical purposes to compare various diet models. A typical family was found to include nine members, as follows:

- 1 child (either sex), 12-23 months old;
- 1 child (either sex), 3-4 years old;
- 1 child (either sex), 7-8 years old;
- 1 child (either sex), 9-10 years old;
- 1 girl, 13-14 years old;
- 1 woman, 18-29 years old, 60kg, moderately active, pregnant 2nd trimester;
- 1 woman, 30-59 years old, 60kg, moderately active, 7-12 months lactating;
- 1 woman, >60 years old, 55kg, moderately active;
- 1 man, 30-59 years old, 65kg, moderately active.

Income for each wealth group was roughly estimated by the team of data collectors and confirmed in the FGDs, but no details on the expenditure of income were checked. In order to get more information on income and expenditure at household level, a new HEA would be needed as the data from the Oxfam HEA in 2015 was considered too old to be used for this CotD. Thus, for this CotD, the results were compared to the entire average income for each wealth group, and not with a part/percentage of income usually spent on food.

Results

For a typical family of nine, a ‘nutritious diet’ and a ‘food habits nutritious diet’ are both available in the rainy season (May/June to October). However, for the poor and very poor families in Bria and PK3 Camp (70% of town, majority of camp population), none of the diets are affordable (Figure 1 and Table 2); these people are unable to meet the ‘energy-only diet’, even when using their entire income.

Table 3 Food rations provided by WFP to people in PK3 camp and Bria Town

Food item	Daily ration (gram/day/person)	# of days per month ration is provided	Total provided per person per month (gram)	Total available per person per day when spread over entire month (gram/day/person)
Rice	300	20	6000	200
Beans	60	20	1200	40
Vegetable oil	20	20	400	13.33
Supercereal	20	20	400	13.33
Salt	5	20	100	3.33
For all children aged 6-23 months in PK3 camp:				
CSB++	100	30	3000	100

‘What if?’ modelling

The CotD software can help to model certain interventions to see how the gap between income and costs for a nutritious diet could be bridged. It can also take account of an available food basket, as is the case in both Bria Town and PK3 IDP camp. The following models show the actual situation in Bria Town and models that could bridge (part of) the gap between nutrient needs and income.

Figure 3 Costs of the diets if a 30-day food basket were to be provided each month in Bria Town and PK3 camp during the rainy season

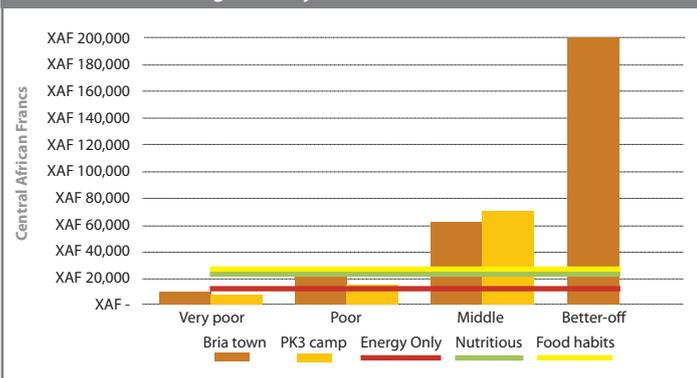


Figure 4 Costs of the various diets compared to monthly income when vegetables are available through kitchen gardening for a typical family of nine in Bria Town, rainy season

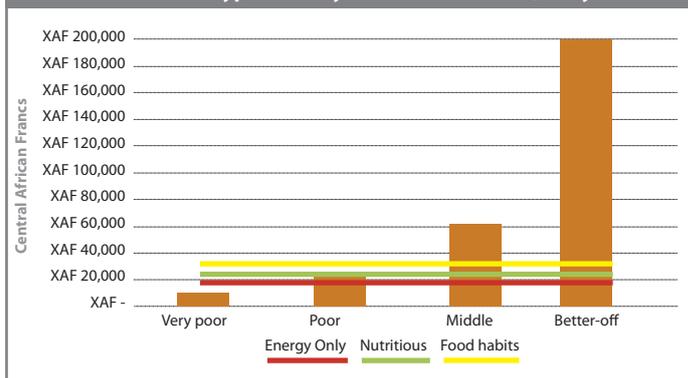


Figure 5 The costs of the various diets compared to the monthly income of a typical family of nine in Bria Town and PK3 camp in the rainy season when receiving a 20-day food basket and free vegetables

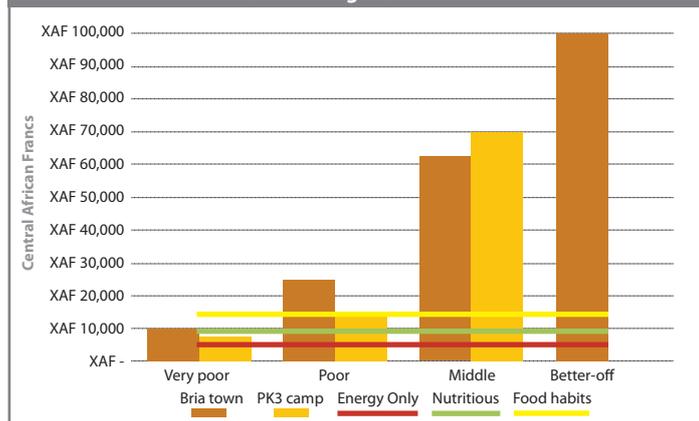
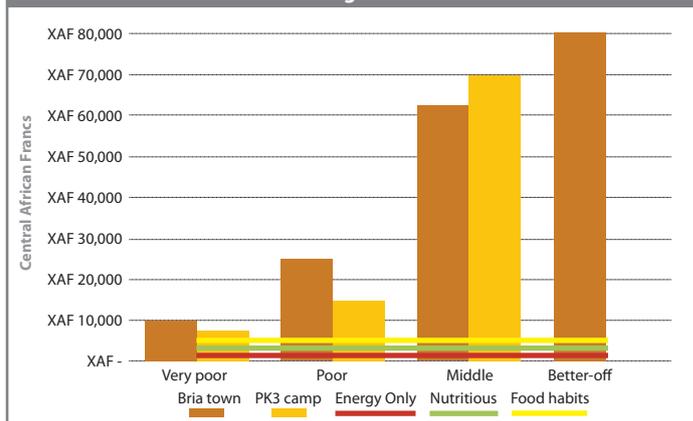


Figure 6 The costs of the various diets compared to the monthly income of a typical family of nine in Bria Town and PK3 camp in the rainy season when receiving a 30-day food basket and free vegetables



What if a 20-day or 30-day food basket is provided every month?

The current GFD in Bria Town and PK3 camp consists of a 20-day ration per person per month (Table 3). Very poor people (40% of population) cannot afford to meet their energy needs for the entire month; poor people (30%) can afford to meet energy needs, but not a nutritious diet or a food habits diet (Figure 2). If this was increased to a 30-day food basket, very poor households still could not afford to meet their energy needs, but poor people could afford to meet energy-only and nutritious diet, although a food habits diet remains out of reach (Figure 3).

What if vegetables were available for free; for example, through kitchen gardening?

If vegetables were available at no cost (for example, through kitchen gardening) in the absence of a food basket, the costs for all diets are reduced significantly, but remain unaffordable for the very poor. For the poor, the energy-only and nutritious diet becomes affordable if all income is used for purchasing food (although this is unrealistic as it doesn't take into account the cost of non-food items, such as clothing and healthcare). Even if all income is used on food, the food habits diet remains unaffordable for the poor (Figure 4). In the camp there is no space for vegetable gardening; an assessment would be needed to investigate whether micro-gardening could be possible.

What if a food basket were provided and vegetables were free?

If a 20-day food basket was provided and vegetables were free, for example through a kitchen-gardening project, an energy-only and nutritious diet would be affordable for the very poor, and all diets would be affordable for the poor (Figure 4). If a 30-day food basket were provided and vegetables were free, all diets would be affordable for all wealth groups, which makes this combination of interventions the most successful model for the current situation (Figure 5).

Several other models were tested, including distribution of multi-micronutrient powders for children aged 6-59 months and pregnant and

lactating women; smaller family size; free eggs for consumption and sale through a livestock distribution; and 25% reduction on all food prices. However, these had no or nearly no effect on costs.

Study limitations

Limitations of the study are that the selection of the standard/typical family is based on experience of the CotD participants, but the reality could be slightly different. No information on prices and availability data of food items during the winter season were collected, so all results and models are only valid for the rainy season. Monthly income was estimated by the data collectors and globally verified in FGDs; however, this was not a very thorough check and no information was collected on expenditure within households on non-food items such as clothing, healthcare and school fees. The HEA conducted by Oxfam provided some information, but the situation in 2015 was very different from the current situation, so it was not possible to use all the HEA data, such as income data.

Discussion

The situation we describe in Bria Town and PK 3 IDP camp is alarming, as the majority of families cannot afford to meet their energy needs, despite receiving a 20-day food basket for the entire household. Even more people are unable to afford a nutritious diet, or one that they would prefer to eat. Programming experience suggests that the situation may be underrepresented in the most recent SMART survey conducted by the Ministry of Health (MoH) and the United Nations Children's Fund (September 2018), which found a GAM prevalence of 7.5% and SAM prevalence of 2.7% for Haute Kotto region. The nutrition situation in Bria is complex and there is no single action that can resolve the issue and ensure that all families will be able to have a nutritious diet. A comprehensive, multisector package of interventions is urgently needed. Results will now be shared with the MoH, UN agencies and other stakeholders in the area.

Recommendations

Based on these findings, several recommendations are made:

- Explore with WFP the possibility for a full 30-day ration for all people in Bria Town and PK3 IDP camp, due to the clear limitations of a 20-day food basket, particularly for the most vulnerable.
- Support efforts to ensure the peace agreement is being respected by all parties, so that roads and markets are safe and accessible for all.
- Support the availability of free vegetables by facilitating families in Bria Town who would like to start a vegetable garden; advocate for an assessment on the possibilities for micro-gardening in the camp when households are unable to access their land; explore possible alternatives for people in the camp to obtain vegetables and fruits (for example, through distribution of fruits and vegetables) or cash to purchase them (while ensuring that markets are able to supply them without creating shortages in areas of origin within CAR).
- Advocate within the Nutrition Cluster and other sectors, such as food security and livelihoods (FSL); water, sanitation and hygiene (WASH); and agriculture, to develop a comprehensive strategy and obtain multisector engagement to address the multiple issues affecting the nutrition situation in Bria.
- Ensure behavior-change activities to improve IYCF and other key nutrition practices are included in all nutrition programmes.
- Conduct a market survey and run the CotD analysis for the dry season to provide information on prices and affordability of a nutritious diet for both seasons.
- Consider conducting a new HEA to provide updated information on current income and expenditure of families in Bria Town and PK3 camp, and collect more detailed information on foods produced by (some of) the families.

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