The Link NCA (Nutrition Causal Analysis) method, based on the UNICEF conceptual framework on the causes of undernutrition, was developed by Action Against Hunger and a small group of researchers and technical experts. It was then validated by a multidisciplinary scientific committee and field tested in Bangladesh and Zimbabwe in 2010/11. Results were gathered, again in Burkina Faso in 2012. The methodology is a standardized means of analyzing the multi-causality of malnutrition. The process is a multisectoral, mixed-method approach which draws conclusions from a synthesis of results on nutrition causality. Link NCA relies on qualitative methods, which are incorporated throughout the process and quantitative methods from secondary data, SMART analyses and risk factor surveys. However it does not, seek to statistically demonstrate causality but rather to create a consensus around the possible causes of under-nutrition in a local context.

The Link NCA is a structured, participatory, holistic and multisectoral study that seeks to:

- Link stakeholders across different sectors,
- Link risk factors and under-nutrition to identify pathways,
- Link different sources of information to build a case for nutrition causality,
- Link the causal analysis to a programmatic response.

To fulfill the criteria of being structured, local and operationally feasible each Link NCA aims to answer the following 6 study questions:

1. What is the prevalence and severity of wasting and/or stunting in the study population?
2. What is the prevalence of known risk factors for under-nutrition among the population and key “nutrition vulnerable groups”?
3. What are the causal pathways of undernutrition by which certain children in the population have become stunted and/or wasted?
4. How have the stunting and/or wasting in this population and its causes changed a) over time due to historical trends, b) seasonally due to cyclical trends, c) due to recent shocks?
5. Which causal pathways are likely to explain most cases of undernutrition? Which sets of risk factors and pathways are likely to be the most modifiable by stakeholders within a given context and within a given period?
6. Based on the causal analysis results, how can the analysis be linked to programmatic responses?

By implementing the Link NCA process, multi-disciplinary stakeholders will be able to generate a consensus of plausible causes of undernutrition in a local context, as well as a set of agreed upon recommendations for the next steps to improving nutrition security programming in the locality.

To learn more go to linknca.org
METHOD FOR CONDUCTING
A NUTRITION CAUSAL ANALYSIS
CASE STUDY
CHAD
ABDI DISTRICT OF THE OUADDAI REGION
2015/2016

Formal and informal institutions,
including markers and service providers
Economic, political and ideological structures
Potential resources
(Human, natural physical, social and financial)

LONG TERM CONSEQUENCES :
Adult size, intellectual ability, economic productivity,
reproductive performance, metabolic and cardiovascular diseases

SHORT TERM CONSEQUENCES :
Mortality, morbidity, disability

Maternal and child undernutrition

Inadequate dietary intake

Inadequate child care and feeding practices

Poor household access to efficient,
safe and nutritious food

Poor household access to quality health services
and unhealthy environment

Disease

Shocks, trends, seasonality

Long term consequences:
- Adult size
- Intellectual ability
- Economic productivity
- Reproductive performance
- Metabolic and cardiovascular diseases

Short term consequences:
- Mortality
- Morbidity
- Disability

Inadequate dietary intake

Inadequate child care and feeding practices

Poor household access to efficient, safe and nutritious food

Poor household access to quality health services and unhealthy environment
STUDY BACKGROUND AND CONTEXT

International Medical Corps (IMC) has been working on nutrition in Chad, which ranks 185th on the 2014 Human Development Index\(^1\), since 2004. A SMART survey conducted in 2014 in the Abdi district (Ouaddai region) in eastern Chad determined that Abdi had some of the highest acute malnutrition rates (wasting) in the Sahel; 13.7% moderate acute malnutrition (MAM) and 4% severe acute malnutrition (SAM) rates were recorded for children under 5 years old.

The experience of IMC in Chad confirmed that the principal factors contributing to malnutrition were linked to structural issues and questions of chronic underdevelopment. There is poor food security in general in the Abdi district. Livelihoods are based on agricultural production of different grains, gardening (which are easily affected by unpredictable rainfalls) and pasturage. The sanitary context is troubling and is particularly connected to reduced access and utilization of the poorly developed healthcare system in the region.

To have a sustainable impact on nutrition insecurity in the region, it was essential for IMC to have an understanding of the principal underlying causes of undernutrition and the local context. IMC decided to implement a Link NCA study, financed by OFDA, to determine the underlying causes and risk factors for undernutrition. After completing the Link NCA study it would be possible to develop appropriate, effective and global program responses, aimed at improving nutrition security in the Abdi district.

\(^1\) http://hdr.undp.org/en/composite/HDI

METHODOLOGY

To evaluate the causes of undernutrition in Abdi, a mixed method approach was used. The quantitative methodology is designed to objectively evaluate the prevalence of undernutrition and its risk factors, while the qualitative analysis seeks to address questions regarding how or why undernutrition/good nutrition occurs. The two methods are complementary and offer an in-depth, global image of the causes of undernutrition. The information from these multiple sources was then reviewed and triangulated through a participatory process to generate a general consensus on undernutrition causality in the Abdi district.

The Link NCA was conducted over 5 months between September 2015 and January 2016 at the end of the lean season in four phases:

**Preparatory Phase**

The first step focused on a literature review of existing data sources which was performed by the NCA analyst. There were also preliminary interviews with governmental and non-governmental partners. This was part of the preparatory phase implemented for all potential Link NCAs, to determine the need and feasibility of conducting a Link NCA study.

**Developing Nutrition Causal Hypotheses**

The next step was to develop hypotheses for the causes of undernutrition in Abdi, with the information gathered from the first phase. These hypotheses were discussed, reworked and validated during a technical workshop in Abeche.

**Community Level Data Collection**

Qualitative and quantitative studies were carried out in November and December 2015 in order to validate the causal hypotheses and potential risk factors developed during the second phase.

**Synthesizing Results and Building Consensus**

After the data collection, the hypotheses were ranked according to importance, while paying careful attention to historical variations and vulnerable groups. The results were then presented to the local community and also during a final technical workshop where outcomes were discussed with stakeholders and multisectoral WaSH, health/nutrition and food security experts. A sequential, participatory process was employed to build consensus around the plausible causes of undernutrition.
HOW LINK NCA LEAD TO A BETTER COMPREHENSION OF MALNUTRITION IN ABDI, CHAD.

FOOD SECURITY AND LIVELIHOODS

Chad (and Abdi) was hit by severe food insecurity in 2011, with an abrupt 40% decrease of cereal production. The following year saw massive flooding in the region. This had a devastating effect on the farming soil.

The results of the study showed that the main factors causing food insecurity were linked first to low diversification of income sources. Despite certain secondary incomes from growing produce such as tomatoes, onions and gombo, it was found that 40.5% of Abdi’s population suffers from severe food insecurity. The decrease in grain production in the area is also important considering that 97.2% of the population practices agriculture. The study reveals that soil depletion and birds frequently attacking crops are also major factors affecting production. Following a period of poor production, locals are heavily dependent on local markets for food, especially during the lean season. There is equally a weak resilience of communities to external shocks on livelihoods such as irregular rains and flooding.

WATER, SANITATION & HYGIENE

There is strong scientific evidence that a lack of clean drinking water has an impact on nutrition, primarily because the pathogens that can easily cause diarrhea in small children are transmitted through contaminated water. In Abdi, water is transported from wells in uncovered, unsanitary jars which can cause further contamination.

Water sources were found to be unprotected and were often shared with animals. In some cases people are forced to dig into the water source resulting in further contamination.

According to the comprehensive food security and vulnerability analysis, only 28% of households in the region have access to potable water. The Link NCA found that only 3% of households used a water source without risk for contamination. Additionally, fecal matter contamination from humans and animals is a major concern. Only 12.9% of households have access to latrines and no one has improved latrines. Proper hygiene practices are also an issue as just 14% of women with children demonstrated having knowledge of appropriate hand washing techniques. Furthermore, soap products are expensive or can sometimes be in short supply and are also principally used for laundry and not for handwashing.

HEALTH CONTEXT

Infections such as malaria, respiratory infections and diarrhea are common in the area. These illnesses are often aggravated by poor access to medical facilities, preference for traditional medical practices, poor vaccine coverage, poor food diversity, suboptimal breastfeeding, inadequate lodging, insufficient hygiene practices and poor access to clean water. Medical care in Abdi district is insufficient both in quantity and quality. The closest hospitals are in Abeche (140km away) and Goz (75Km away). Elevated medical costs and long distances can in part explain why medical centers are underused, but the main reason was that communities prefer traditional healing practices. (See page 6 for more information).
NUTRITION AND CARE PRACTICES

Of the 766 children examined between 0-59 months, 15.9% suffered from GAM (Global Acute Malnutrition), 3.8% had SAM (Severe Acute Malnutrition) and the prevalence of chronic malnutrition was found to be alarmingly high at 38.6%. 32.3% of children were found to be underweight; of those 11.1% were severely underweight.

According to the study, household food consumption is relatively diverse but there is a tendency toward favoring less nutritious foods. These preferred foodstuffs do not provide the micro/macronutrients necessary for good nutrition. Only 5% of mothers practice exclusive breastfeeding during the first 6 months, while children between 6 and 23 months rarely receive the minimum nutritional requirements needed in terms of food diversity, regularity and consistency. Most of these outcomes can be explained by low household incomes, limited access and unavailability to diverse foodstuffs in local markets, high maternal workload, low birth spacing and poor knowledge of correct feeding practices.

GENDER DYNAMICS

The role of women in the community was found to affect their well-being and the nutrition of their children.

The high workload of women in the region was linked with infants’ undernutrition because of the mother’s general unavailability to care for them; 32% of local women say they were too busy to properly care for their young children.

According to the qualitative inquiry the workload is higher for women than for men. Women are expected to prepare all meals, to feed, dress and clean the children, do the laundry, gather the well water and fire wood as well as to buy and sell food in the local markets. Women are also the principal source of manual labor. Between June and December, in addition to tending their own plots, women are expected to work as agricultural day laborers, which is a key source of income during the lean season. Men and women alternate between working their own land and working other fields.

Since women are less available to make visits to medical centers (always prioritizing the livelihood of the household over medical care) they have less time to ensure good feeding techniques and hygiene practices for their children.

In the Abdi district, women have very little decision making power. Indeed, only 0.6% of women contribute to decisions concerning medical care for their children. Early marriages are also a very common practice in the area to avoid social stigma, to bring the community closer together and to a lesser extent, to collect dowries.

In Abdi, 43.6% of households with at least 1 child under 5 are polygynous. Polygyny, as it is practiced in the area has an impact on the women’s workload. Time of polygamous men are divided among more than one household. This situation creates a vicious circle for wives as they compete with one another for the husband’s resources (income and manual labor); the husband favoring whichever household has the best harvest, food diversity, provides the most children, or whichever has the most compliant wife.

“When a woman disobeys or asks too much of her husband, he takes another wife so that she’ll be obligated to obey and work hard; otherwise he’ll favor his other wife and not help at all.”

There is very low birth spacing for women in the region. Low birth spacing overburdens women who have little to no time for recovery after their pregnancies; 26.2% of interviewed women did not have any time off after giving birth.

In Abdi, 45.3% of children surveyed were less than 2 years apart from their older sibling. As energy needed is much higher during pregnancy, low birth spacing can lead to maternal exhaustion, when mothers are no longer able to recover lost nutrients, depleted during pregnancy and lactation.

Low birth spacing can also lead to early weaning practices. The older child generally receives less attention when it is discovered that the mother is pregnant; mothers declare they often abruptly cut them off from breastfeeding because they “do not have enough milk” or their milk “made their children sick”. Despite low birth spacing, most pregnancies are desired. Indeed, children are considered a blessing, providing better food security, manual labor and social benefits.
IDENTIFIED MAJOR RISK FACTORS

Results emphasized that nutrition pathways are intrinsically interrelated and multisectoral. After analyzing the data, the NCA analyst assigned ratings (minor, important, major, rejected or not tested) to the risk factors. Results were then presented, discussed, validated and given confidence notes during the final workshop.

Of the 24 risk factors, 7 were determined to be major by both the NCA analyst and the multisectoral experts. There was general consensus with the analyst’s assessment; though one factor (high maternal workload) was deemed to be major by the analyst but was categorized as important by the experts. This classification was justified by arguing that the more the women work the more money and food they will receive, thereby improving the nutrition status of themselves and the children in that household.

### Risk Factor Ratings by NCA Analyst and Final Workshop:

<table>
<thead>
<tr>
<th>RISK FACTOR</th>
<th>CLASSIFICATION OF RISK FACTOR BY NCA ANALYST</th>
<th>CLASSIFICATION OF RISK FACTOR BY CONSENSUS DURING FINAL WORKSHOP</th>
<th>CONFIDENCE NOTE FROM FINAL WORKSHOP (OUT OF 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate Infant Feeding Practices</td>
<td>MAJOR</td>
<td>MAJOR</td>
<td>3.0</td>
</tr>
<tr>
<td>High Prevalence of Infantile Illnesses (Diarrhea, Malaria)</td>
<td>MAJOR</td>
<td>MAJOR</td>
<td>2.8</td>
</tr>
<tr>
<td>Poor Access to Medical Centers/Care</td>
<td>MAJOR</td>
<td>MAJOR</td>
<td>2.9</td>
</tr>
<tr>
<td>Inadequate Therapeutic Practices</td>
<td>MAJOR</td>
<td>MAJOR</td>
<td>2.8</td>
</tr>
<tr>
<td>Poor Access to Potable Water Sources</td>
<td>MAJOR</td>
<td>MAJOR</td>
<td>2.8</td>
</tr>
<tr>
<td>Inadequate Hygiene Practices</td>
<td>MAJOR</td>
<td>MAJOR</td>
<td>2.8</td>
</tr>
<tr>
<td>Insufficient Agricultural Production</td>
<td>MAJOR</td>
<td>MAJOR</td>
<td>2.7</td>
</tr>
<tr>
<td>High Maternal Workload</td>
<td>MAJOR</td>
<td>IMPORTANT</td>
<td>2.7</td>
</tr>
</tbody>
</table>
Inadequate therapeutic practices were found to be a major risk factor and a unique nutrition pathway, both for its effect on nutrition as well as the practices themselves, some of which could be considered ineffectual or even detrimental.

The local community did not identify this as a major pathway. Yet because of its prevalence during the qualitative survey, the evidence in scientific literature/secondary data review and the association with seasonal malnutrition trends, inadequate therapeutic practices was recognized as a major cause of malnutrition during the Link NCA.

The quality of medical treatment and access to medical facilities was found to be very poor in general. There is also a high prevalence of childhood morbidity in the district. Of children under 5 who had diarrhea within the 14 days before the qualitative study, only 58% were treated and of those only 37.6% were treated in a medical facility.

In Abdi, allopathic medical services are generally used as a last resort. Only 7.8% of women interviewed used a medical facility for their most recent delivery. Locals prefer traditional therapeutic treatments from Marabouts and traditional healers. Local families normally consult a Marabout first, either for curative or preventative treatments. The Marabouts treat patients, first by reciting verses from the Qur’an which will allow “the word of god” to annihilate the evil forces that the local community believes cause the illness.

Marabouts also write Quranic verses on planks of wood, wash them with water, and then give the water to the sick to drink. Finally, small pieces of paper, inscribed with Quranic verses are put into leather amulets to prevent new illnesses.

If these traditional cures are not effective, local healers are consulted. In this local context, to treat diarrhea, the healer will intentionally induce more through certain practices. To treat the worms healers must “kill them and evacuate them.”

“The Diarrhea is caused by worms and the healers force them out with plants that cause more diarrhea. This is how they evacuate the worms from the child”

Mother from the Ourga village

Healers also practice scarification or will burn certain parts of the body including the anus. Fasting or restricted diets from 3-40 days, are commonly recommended, which can have a major impact on the health and nutrition of the patient.

To treat fever, healers burn the forehead or bleed the patient in order to “draw out the bad blood”. For breathing difficulties the healers will cut out the uvula with a scalpel bought in the local market.

When the illness is considered serious or advanced the sick will travel long distances to consult specialized healers who often charge much higher prices (up to 10000 FCFA). These healers specialize in performing genital mutilation on girls more than 3 months old in order to treat diarrhea.

Locals also refer to “Dr. Tchoukous”, who are effectively self-declared doctors, running informal pharmacies where they prescribe drugs and injections. Dr. Tchoukous are consulted because they are geographically closer and less expensive than medical centers.

Certain therapeutic practices such as induced vomiting/diarrhea and restrictive diets directly impact the patient’s nutrition, even more so for children under 5, while others can certainly hurt the well-being of the patient. Though immediate medical care could have possibly corrected the illness, the condition often worsens overtime while pursuing traditional therapeutic treatments.
WHY DO LOCALS PREFER TRADITIONAL THERAPEUTIC TREATMENTS?

Understanding why locals prefer traditional healing practices is important to apply an adapted nutrition response. Reasons cited during interviews for favoring traditional treatments included: geographic distance to medical centers, elevated prices for treatments, poor quality of medical care, poor reception at medical centers and finally the policy for free care for children under 5 was not respected in the district. Still, because of the long distances travelled and high fees paid to consult healers, it is believed that the etiology, or the local perceptions of the causes of disease, principally explains the partiality for traditional medicine. The type of care pursued is therefore dependent upon the perceived causes and diagnosis of the illness by the entourage or community of the sick, who then choose in favor of traditional therapeutic practices.

Abdi Community Therapeutic Practices:

- Onset of symptoms: diarrhea, cough, fever...
- Sick child
- Search for treatment
- Maraboutage
- Prayers and treatment with water that has washed the verses of the Qur’an written on a board
- Community Diagnosis: Causes of community suspected illness
- Traditional healer
- Marabout
- Search for care at the health center
- Healer of the village
- Specialised healer
- Recommendation for child fasting: stop milk, meat, fruits, peanuts, sugar, vegetables from 3 to 40 days, depending on the severity of the child’s condition
- Sickness
- Nutrient deficiencies
LINK NCA RESPONSE AND RECOMMENDATIONS

- **Health infrastructures:** Strengthen health system by ensuring supply of inputs and equipment to health facilities; develop capacity building and supervision of health staff.

- **Reproductive health:** Create awareness on birth spacing methods and nutritional needs for pregnant and lactating women. Monitoring and evaluation of IYCF (Severe Acute Malnutrition) sensitization should be done regularly to assess changes in behavior and impact the different target audiences, thus adapting the methodology to the barriers to message appropriation.

- **Access to drinking water:** Ensure community access to drinking water through the development and protection of water sources. Provide technical assistance to the communities to build sanitation infrastructure with materials available locally. Mobilize and sensitize communities on water management and treatment, and hygiene and sanitation practices. Adapt channels, tools and content of sensitization messages to suit target audiences, resources, local languages and community constraints.

- **Develop agricultural sectors:** Support and strengthen agricultural, market gardening and livestock sectors for diversification of livelihoods and strengthening communities’ resilience. Facilitate access to cattle feed during the dry season (peanut shells), develop access and use of agricultural inputs and tools to increase production and reduce women’s workload, support women groups in the development of income-generating activities. Limit women vulnerability by promoting men involvement in agricultural and domestic work and care of children.

- **Gender:** Conduct advocacy on gender promotion, to limit practices of excision and early marriage.

- **Conduct a Link NCA study** on nomad populations.
There is a vast range of possible programmatic responses and although attempts were made to involve multi-sectorial actors, the scale of the response is currently limited to the IMC organization.

The Link NCA results were used on two fronts: firstly to adapt IMC’s (International Medical Corps) already existing sectoral interventions for IYCF activities (an identified major risk factor) and to develop a larger multisectoral intervention strategy on nutrition security to reduce undernutrition beyond CMAM (Community-based Management of Acute Malnutrition) approaches.

Furthermore, a proposal is in the process of being developed to specifically respond to the new IMC nutrition strategy in Abdi.

There was a substantial turnover of coordination level staff at IMC in the capital N’Djamena around the start of the project. As a result it was difficult to link the nutrition results to a higher level multi-stakeholder response. A lesson learned is that the response analysis following the Link NCA should be followed by well-informed key staff in the capital; who should work closely with other relevant stakeholders (particularly the MoH in Chad) in order to guarantee a maximum impact of nutrition after the results of the Link NCA.

**NEXT STEPS:**

**LINKING ANALYSIS TO AN APPROPRIATE NUTRITION RESPONSE IN ABDI**
Auteur : Patrick McCarty
Contributeurs : Laura Courbis, Gwenaëlle Luc, Suzanne Brinkmann

For further information about the design or implementation of a Link NCA, visit the dedicated website:
www.linknca.org

To communicate with an expert about any Link NCA-related questions: linknca@actioncontrelafaim.org