

activity; expansion of water supply system in Shinile town and excavation of boreholes. *HCS (Hararghe Catholic Secretariat)* is also involved in water provision, animal health, human health (training TBAs and medicine supply) and supports fuel for the routine vaccination. *Handicap International* works on the expansion of drinking water supply and training to District Administration. *UNICEF* offers teacher training; education materials supply and supports EOS program. *WFP (World Food Program)* provides general food distribution and food for the school feeding program. *BESO (Basic Education Strategic Objective)* offers teacher training; has established district pedagogical centre; provides new software for personal information management to the education bureau.

2 DESIGN AND METHODS OF THIS ASSESSMENT

The nutrition surveys for this research were carried out in 2 seasons for the pastoral and 2 seasons for the agro-pastoral LZ. The pastoral surveys were timed to fall one at the end of the *karan* rainy season (P1; September 2005) and at the end of the *jilaal* dry season (P2; March 2006). The agro-pastoral surveys were timed to fall one in the mid *jilaal* (AP1; November 2005) and one at the end of the *dira* dry season (AP2; May 2006). Shinile and Dambal districts of Shinile zone were selected for the study because they are already operational areas for SCUUK in the Somali region and the security situation is stable. For much of the Somali Region the security situation would make this kind of assessment extremely difficult.

The design was cross-sectional, the same children were not purposely followed at each round, but because we revisited the same sites, some of the same children were found in the repeated survey rounds. These children were identified by matching the names of household head, carer and child for each repeat round to find out how many households were revisited. A future longitudinal analysis is therefore possible with those children, but not undertaken for this report.

2.1 Conceptual framework

The emphasis is on measuring anthropometry (stunting and wasting and underweight) as indicators of chronic and acute malnutrition; we have not attempted to measure signs of micronutrient malnutrition. The research followed the UNICEF model above; the areas covered specifically by this research are detailed in figure 3.

2.1.1 Definitions of caring practices

Care-giving behaviour includes breastfeeding and complementary feeding practices, hygiene practices, health seeking behaviour and providing stimulation and emotional support. It also includes care of mother. Constraints to providing adequate care are many including lack of food of sufficient quality and quantity, economic resources, time, knowledge, health services and a hygienic environment, the competing household's priorities for resources, social support and stress of the mother (fig 3).

2.1.2 Immediate causes

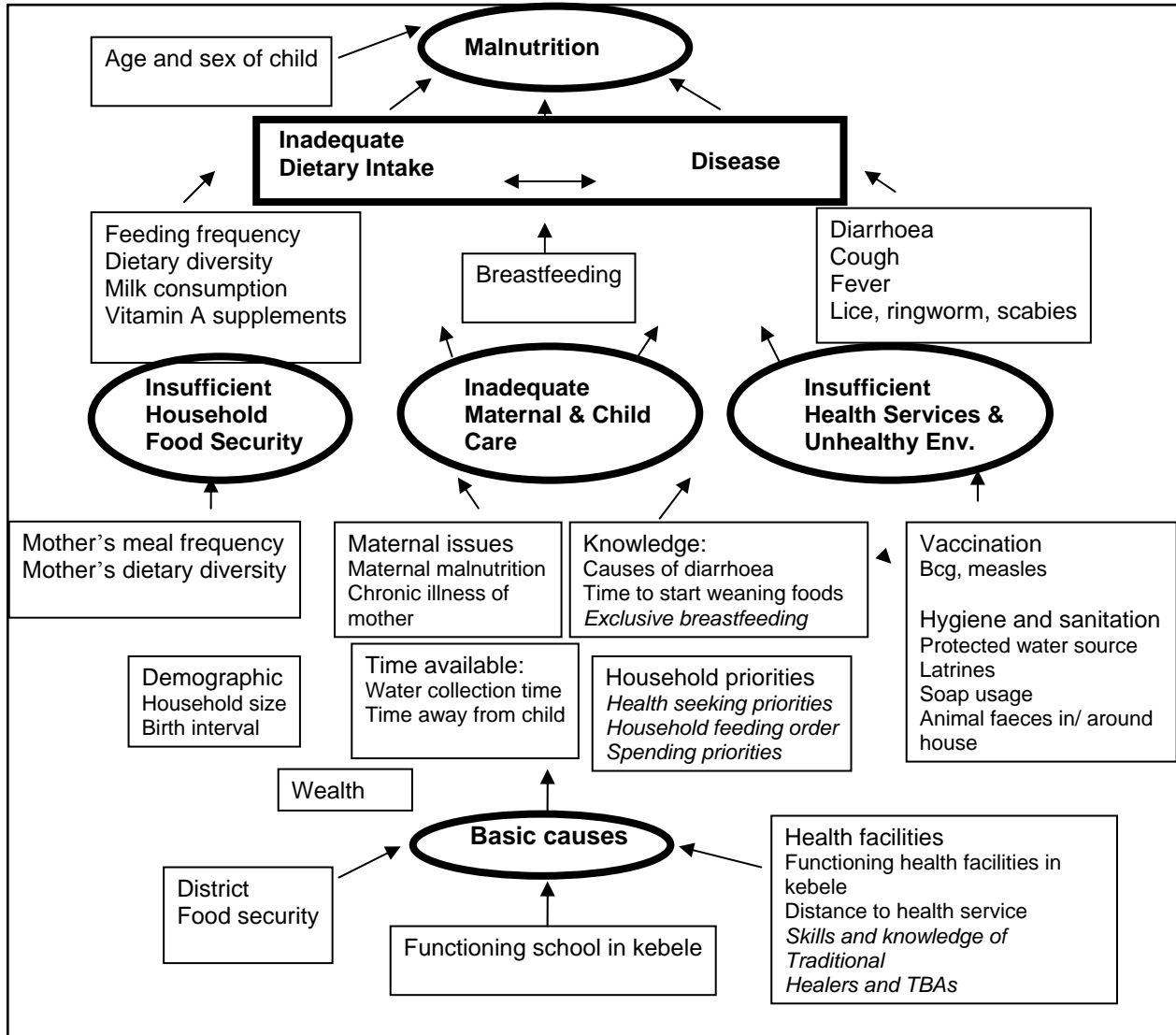
These included feeding frequency, dietary diversity and milk consumption (all assessed by recall of previous day's consumption); vitamin A supplements in the previous 6 months; breast feeding (whether the child was breast fed the previous day and if so whether it was exclusive or predominantly exclusive). The disease group included diarrhoea, fever or cough in the previous 2

weeks and the presence of lice, ringworm or scabies by visual inspection. The symptom of fever is non-specific but will include malaria that is known to be prevalent in the area.

Figure 3

Conceptual Framework of potential causes of malnutrition used in the research

The factors in italics were assessed qualitatively, for the rest, the assessments were quantitative.



2.1.3 Underlying causes

Insufficient household food security was assessed by mothers daily meal frequency and monthly diversity of foods consumed. The constraints to providing adequate maternal and child care were considered under five groups: maternal issues, time available, knowledge, household priorities and demographics. The wealth of the household is also included here as a constraint to caring practices. Insufficient health services and unhealthy environment were assessed by two groups of variables: vaccination and hygiene and sanitation.

2.1.4 Basic causes

Basic causes considered were district food insecurity, lack of school facilities and lack of health facilities. These factors were assessed at the level of the kebele. The analysis did not attempt to identify some of the root causes, such as political issues, cross-border issues, global climate change, globalization and other international political determinants of malnutrition.

The research required a quantitative survey of households, key informant interviews and FGDs.

2.2 Quantitative assessments:

Households with children aged less than 3 years were selected because children of this age are vulnerable to the development of stunting or wasting. The sample size for each survey round was approximated by the inclusion of 12 variables in a multiple regression model for anthropometric indices and a design effect of 2. This calculation suggests a sample size of 960. We aimed for 1000 households with children under 3 years and to reach this exhaustive sampling was necessary. In each household two questionnaires formats were completed. The questionnaires were pre-coded but allowed for extra codes to be added in the field. The household information was collected from the mother or other carer of the child and included demographics of the household, household illness, water and sanitation, knowledge of the mother/carer, maternal anthropometry, food security, animal ownership. A second format was used for each child under 3 years covering anthropometry, vaccinations, morbidity, feeding practices and time the mother or carer spent away from the child. Completion of questionnaires and anthropometric assessments were carried out by a team of trained enumerators and local, trained auxiliary helpers who also acted as local guides. The formats were based on SC-UK's previous experience and were field tested prior to use (see Appendix for formats).

2.2.1 Anthropometric assessments:

Age to the nearest month was recorded for all children using a detailed local calendar. Weight for all ages was recorded to the nearest 10g using Soehnle electric beam balance scales. Length was measured for all children aged 6 months or more. A standard wooden length board with 0.1cm demarcations was used. Children under 85cm were measured standing and less than this lying down. The presence of bilateral oedema was assessed in children over 6 months. Mid-upper arm circumference (MUAC) was measured in children over 6 months and mothers to the nearest 0.1cm using a standard MUAC measuring tape. There were problems in P1 with weights and age assessments, hence most data are presented for just 3 survey rounds.

2.2.2 Data analysis and statistical methods

A feeding score, maternal knowledge score, hygiene score and HIV/ AIDS proxy indicator score were constructed from the data (Appendix). Quantitative data were entered and cleaned in Epi info 6.04, which was used to calculate anthropometric indices. Where the measurements of weight, height and age produced indices outside the usual range of expected data the Epi info programme produces a special marker and these data are excluded from the analysis. Five children were excluded in the height for age analysis and 13 in the weight for height analysis due to this. Further clarification is available in the Epi info guidance²³. Further analysis was conducted in the STATA (version 8) and graphs in SPSS (version 13). Statistical tests were applied: t tests for the difference of means, chi squared tests for the difference in proportions and,

²³ Using Epi-Info 6.04 Data processing and analysis of nutrition surveys: a training manual ; SCUK 2003

multiple logistic regression analysis for the relationship between malnutrition indicators and several parameters simultaneously. Multi-level analysis was used with household as the primary sampling unit to allow for multiple children from the same household. The multiple logistic regression methods and results are shown in the Appendix, tables A5-8. Briefly, the purpose of was to determine the importance of many possibly important factors simultaneously; this is necessary to determine if various factors are associated independently with malnutrition. ORs were used²⁴. Unless otherwise stated, the malnutrition analyses are presented for three rounds (AP1, P2, AP2) data together.

2.2.3 Limitations of the quantitative assessments:

Because the surveys were cross sectional at the household level, they have several limitations:

1. Implications of causality from associations in the data need to be cautiously interpreted; when two factors are associated it does not necessarily mean that one causes the other.
2. Analysis is dependent on household variability; where there is no variability the statistical methods cannot be used, for example if most women are uneducated it is not possible to assess the association of education and malnutrition.
3. We do not know the reasons for the reported behaviour

To address these limitations, additional sources of information were used: background information collected from key informants and district officials and FGDs to explore findings in more depth.

2.3 Qualitative assessments

2.3.1 Key informants: In each kebele (village) additional information was collected from key informants, a group of senior male community leaders. This information focused on kebele-level information, such as the nearest health facility, education and market, rainfall performance, livestock condition and food relief. The key informants also outlined the main problems they perceived in their communities and some offered solutions.

2.3.2 District officials: were interviewed in Shinile and Dambal about education, health, food distributions and other organizations working in the area.

2.3.3 Focus group discussions: these were carried out with women, men, children and TBAs. The information gathered was focused on gaining an understanding of the reasons behind particular practices identified by the quantitative assessments. At the start of the assessment FGD with community elders was used to describe the typical profiles of the wealth groups. Further details were also gathered on the time schedules of women, priorities for purchases and health seeking behaviour. Children were asked about their experiences of taking care of their younger siblings. TBAs were asked about the health care they offered communities. FGDs were not carried out in each kebele, but in rotation in different kebeles and lead by a dedicated facilitator.

²⁴ In this analysis, the lower the p value, the more significant the variable in the model. A low odds ratio means that the risk associated with the factor is less, for example if for diarrhoea the odds ratio is 1.2 it means for those with diarrhoea the odds of being malnourished is 20% more likely compared to a child without diarrhoea