Methods

We used the same methodology for the assessment of health status in the two camps.

Survey

Sampling method:

In each camp, we took a two stage cluster sample based on the latest update of the population census. In Koboko, sample size was calculated to get a +/- 3% estimate (95% confidence interval) around an 10% expected malnutrition prevalence (30 clusters of 30 households). In Rhino camp, using the same assumptions, a smaller sample could be taken (30 clusters of 26 households) because of a higher sampling fraction.

Household was the sampling unit. A household was defined as the people who slept in the house the night preceding the survey and who usually take their meal from the same pot. In case of a man with more than one wife, the wives children were all put in the same household if they were eating together or separated in different households if they take their meals separately. In this case, the head of the household was included with his first wife's household. When a household was absent on a first visit, a message was left to the neighbours, and a second visit was done at a different time.
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If the household was still empty, we assumed that nobody had slept in the house the night before and chose another household.

In each household, children between 65 and 110 cm were included in a nutritional and measles immunisation coverage survey.

General information:

On household level, we collected data on ethnic group, date of arrival in Uganda, date of arrival in the camp, water and sanitation, availability of covered containers and blankets. We used a local event calendar based on religious and political events since 1990.

Population structure:

In each household, we asked for the number of under five and over five, according to the sex and regardless of registration status. Individuals who had travelled and who had not spent the previous night in the household were excluded. In Kokobo, we also asked how many unregistered people there were among the people physically present in the household, as Red Cross camp managers felt this was a special problem in Koboko.

Retrospective mortality

Mortality rates:

We asked the head of the household how many people had died in their household since Easter (16th of April 1995). The total number of deaths in the sample was divided by the total number of households members to obtain a mean mortality rate

during the recall period. Results were expressed in Deaths per 10000 person-day and presented separately for total population and under five.

Specific mortality:
We performed a verbal autopsy to calculate specific mortality rates for diseases that were identified as the main causes of death according to surveillance data in Koboko (pneumonia, malaria and bloody diarrhoea). We used the following case definitions (adapted from Ugandan case definitions) for the retrospective specific mortality figures:

Malaria: fever, plus headache (when possible to assess) without any other cause of fever

Acute Lower Respiratory Tract Infection: Cough, plus high fever, plus rapid breathing, plus severely ill looking.

Bloody diarrhoea: Three loose stools or more per day and blood in stools.
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Morbidity: As there was no ongoing epidemic in the camp, we did not do a retrospective morbidity survey.

Food distribution:

We asked to the households heads when they had received the last food distribution. Results are expressed in weeks.

Nutritional surveys:
We measured the middle upper arm circumference with a 2 mm precision using an MSF standard measurer, and weight with a standard 25 kg Salter scale. We used length and height boards to measure children. Those under 85 cm were measured lying while those over 85 cm were measured standing. Oedema was defined as the bilateral persistence of a pit after normal thumb pressure applied to both feet for three seconds.

Children with MUAC under 125 mm had their percentage of weight for height calculated in the field on a standard CDC/NCHS/WHO chart and were referred for supplementary feeding if under 80% or to therapeutic feeding if under 70%.

Immunisation coverage:

We assessed the measles immunisation coverage using two different methods. The first (strict criteria) was based upon measles vaccination record on the child health card. The second (loose criteria) was based on a measles vaccination history as reported by the mother.

Water and sanitation survey:

We assessed water availability by asking the women in the households how many jerrycans of water they were bringing into the household every day. The number of jerrycans was multiplied by the capacity of the jerrycan to get the total volume of

water brought in the household. We then divided the total number of litres in the sample by the number of individuals in the sample to get an estimate of the number of litres available per person and per day.

Field workers:

Field workers and supervisors were community health workers and health staff of the camp. Although some had already been involved in nutritional surveys, they were trained for two days before fieldwork. The first day was general introduction, field methods of randomisation and anthropometric measurements. The second day was standardisation of the data collection procedure through a pilot study.

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Data analysis

Data were entered and analysed in the field using Epi-Info version 6 software package (CDC, Atlanta. GA, USA). Weight for height z-scores and standardised prevalences were calculated from CDC/NCHSIWHO reference tables using EPINUT module of Epi- Info software (Epicentre, Paris). Confidence intervals were calculated according to the design effect actually observed in the sample using EPINUT and CSAMPLE modules of Epi-Info software. For mortality rates, confidence intervals were calculated in EPITABLE software, assuming a design effect of 2.

Data obtained from informants:

We interviewed the people in charge of water supply, sanitation and food distribution in each camp. These information complete the results of the survey.

Evaluation of the public health surveillance system:

We reviewed surveillance reports for April, May and June 1995 in order to identify the main diseases present in the camps. Results of the retrospective mortality survey were compared with surveillance data in order to quantify the sensitivity of the surveillance system. We also interviewed the persons responsible for public health surveillance in Rhino and Koboko camps in order to understand the way the system worked. We used the Centers for Diseases Control guidelines for the evaluation of public health surveillance systems