

ASSOCIATIONS BETWEEN CHILDCARE PRACTICES AND CHILD
GROWTH, DEVELOPMENT AND MORTALITY AMONG REFUGEES IN
KIBONDO CAMPS -TANZANIA

BY

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Declaration

I, JEAN SENDWE NYOMBO LUBOYA hereby declare that this thesis is my original work and has not been presented for a degree in any other university.

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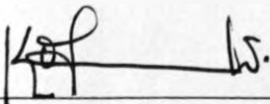
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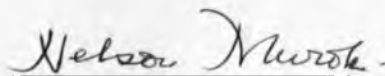
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Dedication

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List of abbreviations

ACC/SCN:	Administrative Committee on Coordination / Sub-Committee on Nutrition
ANP:	Applied Human Nutrition Programme
ARI:	Acute Respiratory Infections
BMI:	Body Mass Index
CDC:	Centres for Disease Control and Prevention
CI:	Confidence interval
CMR:	Crude Mortality Rate
CSB:	Corn Soya Blend
DHS:	Demographic Health Survey
DRA:	Dutch Relief Agency
DRC:	Democratic Republic of Congo
EBF:	Exclusive breastfeeding
EPI INFO:	Word Processing, Database and Statistics for Public Health Software.
FAO:	Food and Agriculture Organisation of the United Nations
HAZ:	Height for Age Z-score
HIV:	Human Immunodeficiency Virus
IDPs:	Internally Displaced Peoples
IMCI:	Integrated Management of Child Illnesses
IRC:	International Rescue Committee
MCH:	Maternal and Child Health
MUAC:	Mid Upper Arm Circumference
NCHS:	National Centre for Health Statistics

NGO:	Non-Governmental Organisation
NutriSurvey:	Nutrition Survey Software
OAU:	Organisation of African Unity
OR:	Odds ratio
ORT:	Oral Rehydration Therapy
RDA:	Recommended Daily Allowance
RNI:	Refugee and Internally Displaced Populations Nutrition Information System
RPG:	Refugee Policy Group
SD:	Standard Deviation
SFP:	Supplementary Feeding Program
SGBV:	Section Gender Based Violence
SPSS:	Statistical Package for Social Sciences
TCRS:	Tanganyika Christian Refugee Service.
TFP:	Therapeutic Feeding programme
U5MR:	Under Five Mortality Rate
UMATI:	Chama cha Uzazi na Malezi Bora Tanzania
UNDP:	United Nations Development Program
UNHCR:	United Nations High Commissioner for Refugees
UNICEF:	United Nations Children's Funds
UNU:	United Nations University
WAZ:	Weight for Age Z-score
WFP:	World Food Program
WHO:	World Health Organization
WHZ:	Weight for Height Z-score

Operational definitions

- **Behaviour.** Action or set of actions that an individual carries out at a specific time.
- **Auto-prescribed medicine.** Refers to the use of medicine without any medical prescription by a physician.
- **Childcare Practices.** Refers to what is believed and done in households and in the community as particular attention given to the growing child. These practices include:
 - **Feeding Practices** (e.g. breastfeeding and complementary feeding practices),
 - **Hygiene care practices** (e.g. cleanliness of the individual and the environment),
 - **Health cares** (e.g. family planning, growth monitoring attendance, immunization and antenatal care, care seeking behaviours),
 - **Psychosocial/emotional care** (e.g. responsiveness, allocating enough time to watch over the child, teaching skills such as talking, sitting and walking)
- **Growth.** Refers to a change in size resulting from multiplication of cells or enlargement of existing ones. In this study it refers to weight, height and teeth of the child given the actual age.
- **Development.** Refers to maturation of structures and functions associated with growth process of organs and systems. It involves acquisition of skills, ability to adapt more readily to stress, and ability to assure maximum responsibility and to achieve freedom in creative expression. Development aspects involve the psychomotor, the language and the cognitive. For the sake of this study it refers to the achievement of developmental milestones of sitting without support, crawling, and walking a few steps by the child.

The distinction between growth and development is not sharp. The two steps have a broad scope and a more complex set of factors with joint progress but at a certain time, there is development with a little increase in size or rapid growth with little differentiation in structure or function.

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- **Refugee.** According to UN convention on Refugees of 1951 and the protocol of 1967, a refugee is “ every person who, owing to well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality and is unable or, owing to such fear, is unwilling to avail himself of the protection of that country” (Population Council, 1981). This has been extended to include also people fleeing war as being de facto refugees. According to the OAU convention, a refugee is “ every person who, owing to external aggression, occupation, foreign domination or event seriously disturbing public order in either part or the whole of the country of origin or nationality, is compelled to leave his place of habitual residence to seek refuge in another place outside his country of origin or nationality.”
- **Internally displaced people.** Is every person who is compelled to leave his place of habitual residence to seek refuge and protection in another place within his/her country of origin or nationality because of external aggression, occupation, foreign domination or event seriously disturbing public order in either part or the whole of the country.
- **Global malnutrition.** Refers to an anthropometric status (of weight or height) of less than minus two z-score of the expected anthropometric indices of a reference child of the same age. In this study refers to the cut-of- point of minus two z-score of weight for age, weight for height and height for age of NCHS/ WHO reference values.

Severe malnutrition is defined as a status of weight for age, weight for height or height for age of less than minus three z-score.

- **Acute malnutrition or wasting.** Refers to the population aged 6-24 months with moderate or severe wasting, defined as weight for height below minus two standard deviations from the median of the NCHS reference population.
- **Moderate wasting.** Is defined as weight for height value between below minus two z- score and above minus three z-score.
- **Severe wasting.** Is defined as weight for height below minus three z-score.
- **Dependent variable.** Is an outcome variable, a variable whose values depend on variations of another variable called independent variable. It is therefore considered as a consequence of the exposure. For the purpose of this study, childcare practices variables, growth and development characteristics, nutritional status indices, morbidity and mortality variables are considered dependent variables.
- **Illiteracy.** Is defined as proportion of adults who did not attend any form of education at all.
- **Independent variable.** It is a predictor, a determinant, an exposure or a risk/protection factor that influence the occurrence of another variable called dependent variable or outcome.
- **Complementary feeding.** Refers to the period the child is progressively receiving semi-solid or solid foods while still breastfeeding.
- **Weaning.** Refers to the period the child stops completely breastfeeding and is fed only on other foods.

- **Exclusive breastfeeding.** Refers to the period the child is fed on breast-milk only without any other type of food or fluid.
- **Mortality.** For the purpose of this study, mortality refers to the death of children aged less than 5 years in the camps. The Under-five mortality rate (U5MR) is computed and expressed as the number of deaths of children per 10,000 live births per day as recommended in emergencies (Moren, 1995).

$$U5MR/day = \frac{\text{Number of deaths of children aged 0 – 60 months of 12 months} \times 10.000}{\text{Total Number of children aged 0 – 60 months} \times 365}$$

- **Morbidity.** Refers to the incidence of any illness reported for exactly or under two years old children in the household. It is an indicator of the community health status with respect to diseases (Daniel, 1987)
- **General cleanliness.** For the purpose of this study, refers to the status in which the child or mother/caretaker was observed to be clean on the four selected aspects: clothes dirty, nose not clean (running nose), face unwashed and hair dirty or unkempt.
- **Confidence intervals.** Represent the range within which the variable (risk, prevalence etc.) that is being estimated is likely to lie. If a large number of sample drawn from the same population, the intervals bound contain the true mean population.
- **Slope of dental eruption.** Refers to a factor associated with dental eruption as a function of the age of the child. It is defined as the ratio of age of the child age 6-24 months minus a constant of time before dental eruption divides by the total number of teeth.

Abstract

In emergencies, despite food ration distribution, presence of feeding programmes and provision of free health cares, malnutrition and morbidity are still a problem that constitute a threat to child survival, growth and development, and information on childcare practices are scarce.

In order to investigate the influence of childcare practices on child nutritional status, growth and development, morbidity and mortality, a cross sectional study was conducted in Kibondo refugee camps in Tanzania. Data were collected during the period between November 2000 and February 2001 in four refugee camps. The sample size comprised 364 pair mothers/children aged 6-24 months in 364 households living in the camps. A structured questionnaire with few open-ended questions was used as a guideline to data collection on childcare practices, anthropometry, food intakes, dentition, developmental milestones, morbidity and mortality. Data management, entry, cleaning and analysis was done using the Epi Info 2000 (version 1.0), the Nutrisurvey update 2000 and the statistical package for social sciences (SPSS version 8.0) packages.

The nutritional status has deteriorated compared to previous surveys. About 6.3% (95% CI: 4.1-9.4%) of children were suffering from acute malnutrition or wasting, 28.5% (95% CI: 24-33.5%) were underweight and 42.7% (37.6-48%) were suffering from chronic malnutrition or stunting. High morbidity (65%) was found among children with high incidence of diarrhoea (48.2%). The Under five mortality rate was 0.75 /10.000 per day.

The results of the study showed that household size and birth order, duration in the camp, household wealth, amount of financial support to the mother and availability of water in the household are the factors which affect household caring capacity.

Childcare practices that showed associations with child nutritional status, growth, disease incidence and mortality of children are: time allocated by the mother to spend with the child, maturity of alternate caretaker, mother's work place (home or away), breastfeeding duration (including exclusive breastfeeding) and complementary feeding patterns (in terms of frequency of feeding, quantity, variety and fulfilment of recommended daily allowances), physical and environmental hygiene (cleanliness, sewage disposal, water utilisation) and family planning practices.

In conclusion, the study revealed strong associations between malnutrition, growth failure, high morbidity and mortality and poor childcare practices but was not conclusive on developmental milestones. Specific programs aimed at promoting behaviour change and at empowering women caring capacity must be set and go alongside with healthcare services, food ration distribution for child survival, growth and development in the refugee camps.

CHAPTER ONE: INTRODUCTION

1.1 Background

Approximately 540 million of children are estimated to live in dangerous or unstable situations (UNICEF 2000). Nearly 12 million of them die before reaching their fifth birthday in developing countries each year (UNICEF, 1998). Those who survive may more often fall sick or grow up with mental retardation or physical disabilities. The immediate causes for under five-year old child death are attributed to malnutrition and diseases. Malnutrition that alone contributes to more than half of those deaths had been attributed to food availability in terms of household food security and presence of diseases that influence food intake, absorption and utilisation of the food by the body (Longhurst and Tomkins, 1995). While child growth faltering and mortality may be the result of inadequate nutrition and health cares, there is clear evidence that suggest that they are also linked to the interaction that occurs between the child and the environment.

The provision of the interaction conducive to better health of the child is carried out through care practices. Childcare practices, that is the process of providing physical, psychological, social and emotional needs of the growing child include: feeding (breastfeeding and complementary feeding), sheltering, clothing, bathing, preventing diseases and attending clinic during sickness, nurturing, stimulating mental development and socialising the child to its culture (Engle, 1992). Care of the child is recognised with the Declaration on Right of the child and strongly promoted within WHO, given its impact on child survival, growth and development (Longhurst and Tomkins, 1995, Engle, 1992, Evans, 1995). Its role in health and/ or nutrition outcomes in hostile environment (of

hardship conditions) has been defined in many studies. Those comparing children who are well- and poorly-nourished found that positive Caring practices are associated with children better nutritional status, even though the children come from the same type of environment of hardship as their malnourished peers (Zeitlin, 1993, Burkhalter and Bashir, 1998). Similarly research focused on “positive deviance” – “failure to thrive” of children in Latin America and the type of interaction between child and environment, was able to identify children who were able to thrive even though the conditions under which they were raised suggested they would be malnourished and not develop well (Werner, 1992 cited by Evans, 1995).

1. 2 Statement of the problem

Among vulnerable group to malnutrition and diseases are children, pregnant and lactating women, the elderly, refugees and internally displaced people (Longhurst and Tomkins, 1985, ACC/SCN, 1999). Refugee children special needs are higher not that only they include those which are basic for growth and development but also those to deal with disruption of the environment and other emotional stress caused by the emergency process. Yet in Sub Saharan Africa, the vogue of conflicts and war leads to thousands of people refugees, most of them are children and mothers. The number of refugees has been increasing since last decade (RPG, 1992). In 1997, there were at least 11.8 millions refugees and internally displaced people in sub-Saharan Africa. Approximately two million of them were considered to be at heightened risk of mortality (UNDP, 1997). Civil wars in Rwanda, Burundi and the Democratic Republic of Congo are the key reasons of displacement of people who cross borders to seek for refuge in the United Republic of Tanzania (ACC/SCN, 2000). One of the biggest problems in these emergencies is that

many people arrive in huge number in a place ill prepared and ill-equipped to receive them (WHO, 1997). These constraints make difficult how to control health and nutrition situation especially when the project is under funded.

Over the years, high incidences of malnutrition and mortality have been reported in refugee camps. Outbreak of epidemics and diarrhoeal disease has been attributed to poor sanitation, overcrowding, poor hygiene practices that characterise refugee camps. In Tanzania acute malnutrition prevalence was about 3.6% (with 0.6% of severe wasting) in Kibondo camps (UMATI – IRC nutrition survey report, July 2000). Cases of abandoned children and men violence towards women were also reported.

Furthermore social disruption, economic and environment constraints of the settled camps may interfere with how to provide good quality care for the growing child. Since the extent to which the community or the household care to the younger child in refugee camps might not be well defined, it constitutes the main concern of this research.

1.3 Study justification

Many studies have been conducted in refugee camps in Africa to assess health and nutritional status in terms of morbidity and mortality rates, nutritional status and food basket, but scarce is the information about childcares practices in emergencies.

The nutritional situation in Kibondo camps has been deteriorating for the last three years (UMATIa, 2000). With the lack of funding of the project, the situation might become worse since refugees rely principally on ration distributed (ACC/SCN, 1999). According to

reports of the nutrition survey prior to our research (UMATIIa, 2000), most affected are children between 6 and 24 months and 36 to 59 months varying among camps. Nevertheless reasons explaining why this category of age presented the highest incidence of malnutrition were not identified. The food basket monitoring reports for the same period showed adequacy of food distribution with a ration of more than 1900 Kilocalories in all the camps. Health services were also optimally delivered as reported in all the camps.

The lesson from available data in many refugee camps (e.g. Kenya, Sudan, Ethiopia), indicate differences in wasting, crude mortality rate (CMR) and under-five mortality rate (U5MR) among different ethnic groups living in the same camp and/or under the same conditions. Although WFP provides adequate food to all people, it was found that the level of bad health and nutritional conditions is as alarming in people settled for a long time in the camp as on the onset of the emergency (ACC/SCN, 2000). Studies focused on the relationship between health, nutrition and stimulation argue that an adequate food and health care supply is necessary but not sufficient to assure a child's optimal development unless within a caring environment (Engle, 1992; Levinger, 1992, Myers, 1992 and Zeitlin, 1993).

For this research, the investigations are more focussed on household and community behaviours toward fulfilling its responsibilities of feeding the child, taking health care measures, maintaining hygienic conditions and providing emotional care to the child. The results of the study are intended to provide an overall understanding of the interrelationship between households' factors, care practices whose role is considered as "a neglected ingredient" in emergencies (Longhurst and Tomkins, 1995) and child nutritional/health

status, dentition eruption and achievement of developmental milestones, morbidity and mortality in the refugee camps.

1.4 Objectives of the study

The main objective of the study was to establish the relationship between childcare practices, morbidity, mortality, nutritional status, attained growth and development of children living in refugee camps of in Kibondo, Tanzania.

From this objective, the specific objectives were:

1. To identify different child caregivers.
2. To determine childcare practices in the refugee camps namely feeding practices including breastfeeding; health care practices, emotional care practices and hygienic practices.
3. To assess the morbidity pattern/ experience of children.
4. To assess the mortality pattern of children aged below five years.
5. To determine the nutritional status of children aged 6-24 months.
6. To determine the attained growth of children aged 6-24 months and their developmental milestones.
7. To identify the relationships between childcare practices (feeding practices, healthcare practices, hygiene practices and psycho-social care practices) with nutritional status, attained growth and development, morbidity and mortality of children.

1.5 Hypothesis

The study was conducted to verify the following hypotheses:

1. The attained growth and developmental milestones do not differ significantly among children in households with different childcare practices.
2. There are no significant associations between childcare practices mortality rates and nutritional status of children aged 6-24 months, living in the refugee camps.

1.6 Expected benefit

The results of the study are expected to add knowledge to existing information in emergencies and to generate data on childcare practices in Kibondo-camps.

The information found is also expected to be used by different organisations -UNICEF, UNHCR, IRC, UMATI, and other non-governmental organisations for planning and designing appropriate interventions.

1.7 Study limitations

The recall problem, like for all cross-sectional studies can be considered as the limitation to this study. Meanwhile health cards were used to validate information on age, health cares attendance and weight gain during growth monitoring session. Enumerators used probing technique during the process of interview to minimize the errors.

2. 1 Literature review

2. 1. 1 Refugees in sub-Saharan Africa, an overview

Sub-Saharan Africa is actually facing the problems of drought, flood, famine and food shortage on one hand; on the other hand, it is torn by conflicts and wars in and between nations that lead to displacement of millions of people within the country (Internally Displaced People) or beyond the country's borders (Refugees).

When disaster strikes, four phases might be considered in the displacement of people (WHO, 1997)

- Exodus: people leave home, usually spontaneously, in unplanned circumstances.
- Emergency: huge number of persons arrives; ill equipped and often ill nourished, in an area ill prepared to receive them.
- Stabilisation: refugee camps become long term home.
- Return: the refugees return to their original towns and villages, often after being away for years.

During all these steps defined above, the nutritional or health situation of the population can deteriorate and be considered as of concern or very serious problem.

2. 1. 1. 1 Health and nutritional situation in emergencies

a) Assessment of nutritional status

Evaluation methods of nutritional and health status of refugees and displaced people use regularly anthropometric surveys. Measures such as weight for height and mid upper arm circumference (MUAC) made on a sample calculated according to the prevalence of malnutrition or based on a 30 clusters of 30 children aged less than 59 months (when the prevalence of malnutrition is not known) are commonly recommended (Jaber, 1995). The assessment of the nutritional status of an individual is based on standard cut-off points below which acute and severe malnutrition is diagnosed while that of the population is based on the prevalence of malnutrition or the mean nutritional status. MUAC for children aged between 12 and 59 months varies by age and might require indices like MUAC for age. Since to determine the age of the child in developing countries' emergencies might be difficult, MUAC can be less appropriate. Therefore, weight and height would be the most preferable anthropometric measurements. When children are aged less than two years and measure less than 85 cm, recumbent length is preferred instead of standing height.

b) Indicators and cut-off points used to assess the magnitude of the emergency situation

In emergencies, criteria used by WFP/UNHCR and all United Nations' agencies are set to determine the magnitude of the problem. Indicators and cut-off points indicating serious problems are levels of wasting above 20%, crude mortality rates in excess of 1/10,000/ day (about four times normal, especially still rising), and /or significant levels of micronutrient deficiency diseases (ACC/SCN, 1999; Moren, 1995; Schofield and Mason, 1995). Furthermore, for a population wholly dependent on food aid, ration less than 1500 Kcal per

day is regarded as an important problem and had been linked with increasing mortality (Jaspers, 1995).

Details on some major criteria considered in selecting a health or nutritional situation as a problem of importance in emergencies are given in **Table 1**.

Table 1: Some indicators showing the importance of nutritional situation in emergencies.

Indicator		In usual population	Serious problem	Severe crisis
Wasting (6 - 59 months)	<-2 z-score < 80% W/H*	5-10%	20%	40%
BMI (adults)		> 18.5	< 18.5	< 16
MUAC (cm)	Children (6-59months)	> 12.5 cm	12.0-12.5 cm	<11 cm
	Adult	23 cm	<22 cm women <23 cm men	
Crude Mortality Rate (CMR)		0.27/10000/day	1/10,000/day	2/10,000/day
Under five mortality rate U5MR		1/10,000/day	2/100,000/day	4/10,000/day
Food distributed		1,950-2,210 Kcal /day	< 1500 Kcal/day	

Source: ACC/SCN, 1999 (RNIs 27 and 28); Moren, 1995; Schofield and Mason, 1995
 * W/H: weight for height (>23 months of age) and weight for length (< 85cm, age >24months)

From existing data, different levels of health and /or nutrition indicators of the refugee populations living in the same country or under the same circumstances were found.

In Ethiopia, Somali refugees had the level of wasting (15.2% to 21.1%) while in the same country; Sudanese refugees had 5.4% to 15.7% in mid 1996 (ACC/SCN, 1999).

In Kenya camps, (Kakuma and Daadab) the level of wasting in 1995 was 9.8-12.1% with ration of 2400-1800 Kcal/day and in August 1996, 15.1%-18.6% among Somalis. In Daadab camp, cases of scurvy were reported among Somalis and in Kakuma camp, cases of anaemia among Sudanese children unaccompanied and not having linkage to any household economy in the camp (ACC/SCN, 1999). Somalis reported different levels of wasting over the years (in August 1995: 9.8-12%, 1996: 15.1-18.6%; in 1998: 10%). In October 1998 wasting was estimated as 15.6% and severe wasting 1.7% in Kakuma camp of majority Sudanese. For both cases, the food basket monitoring showed that the ration distributed by WFP was an adequate general ration.

A part from protein energy malnutrition, cases of micronutrient deficiency syndrome has been reported as well in refugee camps (Toole, 1993) from which are anaemia and scurvy (in Sudan, Somalia, and Ethiopia), xerophthalmia (Sudan), beriberi (Thailand) and pellagra (Malawi).

2.1.1.2 Food consumption

Food rations, malnutrition and deaths rates have been closely related in many relief operations in Thailand and Sudan (ACC/SCN, 1991). Increase in rates of malnutrition has been observed with serious food shortages. Food ration of less than 1500 Kcal for a population totally dependent of food aids and water shortage of less than the minimum of 20 litres per person per day (UNDP, 1997, ACC/SCN, 1999) is considered as a problem of concern.

The direct effect at long or short term of food intake on child nutritional status and growth patterns has been documented both in many parts of the world among people facing famine and starvation and in different studies based on direct intervention (Muto, 1988, Dervi and Geervani, 1994). The purpose of food ration is to maintain life of the vulnerable population from deterioration by maintaining usual weight of individuals when healthy and possibly to allow catch-up for pre-existing malnutrition, and to provide energy for a specified level of activity with light activity as minimum defined by FAO/WHO/UNU 1985 (Schofield and Mason, 1995). On their side, supplementary feeding programmes (SFP or TFP) for refugees and displaced people are relevant to prevent growth failure and starvation, to treat current moderate or severe malnutrition and to promote normal child development (Curdy, 1995; Beaton, 1997).

a) Nutritional requirements of the young child and food ration

Different agencies have their own guidelines they use to set ration requirement levels. Existing recommendations of WFP/UNHCR and all United Nations' agencies for energy are 1900 Kilocalorie minimum to be adjusted as soon as possible according to the activity level of people, climate, demographic composition and health/nutrition status (Norton and Nathaniel, 1995). Fat and protein are recommended at least taking 8% and 10 % of total energy. FAO/WHO, Codex Alimentarius Recommended Daily Allowances (RDA) of selected micronutrients for children aged less than five years (Toole, 1995) are set for vitamin A (1320 IU), thiamine (1.2 mg), riboflavin (0.8 mg), niacin (9 mg), vitamin C (20 g), iron (12 mg) and calcium (0.8mg). To prevent micronutrient deficiencies, fortified blended foods are included as part of food ration.

A full food basket consists of six food commodities (UNHCR/WFP ration), which are a staple food made of cereals (wheat, rice or maize), an energy source from an edible fat (oil or fat), a protein source from pulses (beans, peas, nuts) or canned or dried fish or meat, salt, sugar and blended food (e.g. CSB, Unimix).

Food patterns for infants and young children require highly dense food (Cameron and Hofvander, 1983, Hendricks and Badruddin, 1992). In refugee/displaced situations, most appropriate complementary food is the corn soya blend or unimix for its density. In normal circumstances, the quantity of 60 grams of CSB that should be commonly distributed provides a major part of micronutrients necessary for the growth of the young child (Toole, 1995). In case CSB is not distributed as it happens sometimes (UMATIa, 2000), food intake for the infant and the young refugee child may be made of a poor diet that undermine good health/nutritional status.

b) Dietary assessment.

In most surveys and cross-sectional studies such as national health and nutrition surveys, nationwide food consumption surveys where the goal is to collect information on the current diet or dietary habit in the immediate past, the most commonly used method is the 24-hour recall although records also are sometimes used (Nieman and Lee, 1995). Feeding patterns showing qualitative food consumption can be assessed through a food frequency questionnaire.

In refugee/displaced population, food basket monitoring that is the monitoring of food ration distributed has become common.

Meanwhile its usefulness is limited by the sample size too small to be reliable, the target based on food ration distributed and not on food consumption, and the time consuming for accurate weighing of food (Jaber, 1995). Other measurements that can be used in nutritional assessment and provide warning of food insecurity and deteriorating situation are households surveys and market monitoring.

2. 1. 1. 3 Refugees in the United Republic of Tanzania

The refugees living in Tanzania, who are estimated to be 465,000 live in camps in twelve locations spread in Kagera, Kigoma and Tanga regions. Approximately 15,000 refugees, who include pregnant and lactating women, receive therapeutic and supplementary feeding every month (ACC/SCNb, 1999). Although this operation contributes to the stabilisation of the nutritional situation of these populations, it is seriously under-funded. Unfortunately, since July 2000, WFP reduced the food ration to refugees by 40 percent. Refugee camps areas in Tanzania are accessible by roads and the food provision is maintained with a stable pipeline so that the population, who was receiving adequate preventive health measures, was not considered at heightened risk of malnutrition before ration cut (ACC/SCNb, 2000).

a) Nutritional situation in Kibondo camps.

Results from the July 2000 nutrition survey revealed that about 3.5% of children were suffering from acute malnutrition (WHZ <-2 Z-score) in Kibondo camps. Table 2 indicates the prevalence of acute malnutrition in Kibondo camps (UMATI/IRC Nutrition survey, July 2000).

Table 2: Prevalence of acute malnutrition among children under five years old in Kibondo camps

Camp	Moderate wasting	Severe wasting	Global wasting
Kanembwa	3.1%	0.5%	3.6%
Mkugwa	2.0%	0.0%	2.0%
Mtendeli	2.4%	0.9%	3.3%
Karago	4.3%	1.0%	5.3%
Nduta	3.5%	0.7%	4.3%
Total	3.06%	0.62%	3.55%

Source: UMATI/IRC Nutrition survey July 2000

More over it was found that, in Kanembwa camps the majority of malnourished were female and those in the age category of below 24 months, between 36-59 months.

b) Food basket monitoring in Kibondo camps

The report of July 2000 food basket monitoring indicates that the range of received full ration for the period between January and June 2000 was 1825 – 2108.9 Kcal for energy and 55.6-69.0 grams of proteins. Meanwhile this survey was carried out before the WFP 40% reduction of food ration that happened in July 2000. Foods that are distributed as general ration in Kibondo refugee camps are cereals (maize meal or maize grain), pulses (peas, beans), corn soya blend (SCB), vegetable oil and salt (see **Table 4**).

2. 1. 2 Child growth and development

Measurement of child growth and development

Often, the assessment of growth and development can be carried out through weight, length/height and skills measures of the child (Cameron and Hofvander, 1983). Skills are assessed through developmental milestones (e.g. grasping, sitting, crawling, walking, talking).

a) Body weight and height

The average normal weight of baby at birth is about 3.00 kg with the interval of 2.500 kg to 3.500 kg (Bennett, 1985). During the first few days after birth, babies lose about 10% of their weight due to the passing of urine and meconium. At 6 months, a child double and at 12 months the weight is tripled. Then the second year, there is an increase of about 2-2.5 kg per year. The average height (length) at birth is approximately 50 cm. By 6 months, it goes to 65 cm, at 12 months about 75 cm and at 24 months 85 cm (Toole, 1993).

b) Other aspects of physical growth

- **Dentition**

Temporary teeth appear on average between the age of 6 and 30 months. Chronologically, teeth appear as follows:

From 6 to 12 months: the first 8 incisors appear,

12 to 18 months: 4 premolars

16 to 22 months: 4 canines

24 to 30 months: 4 second premolars.

By the age of 2 years, a rough estimate of the baby's age may be done by counting the number of teeth and adding to 6 to give the age in months e.g. a baby with 4 teeth is $4+6 = 10$ months old (Bennett, 1985).

The primary dentition falls at about 6 years and is complete between 10-12 years, while the permanent dentition appears between 6 and 21 years.

- **Fontanel** . The anterior fontanel remains open up to 18 months.

c) Developmental milestones

Developmental milestones are the various skills that the baby and young child learn (Balldin, 1991). These include what the child can do in such a way of moving around (motor development), how he talks and make his wants known (language) and how he fits into his family and community (social behaviours). Selected children skills used to assess developmental milestones are given in the Table 3.

Table3: Developmental milestones of children aged three to twenty four months.

Skills	Age of achievement (months)	
	Average child	Nearly all children
Balances head	3-4	6
Active grasping with hand	4-5	6
Sitting without support	6-8	11
Able to walk a few steps	12-14	15
Able to speak 4-5 single words	15	21

Source: Toole, 1993 Balldin, 1991

Factors affecting child survival, growth and development

The basic determinants of child survival, growth and development are classified into three broad categories (UNICEF model) that are the immediate causes (food intake and diseases), the underlying causes (food availability, care to both mother and child and health care) and the basic causes (political, economic and cultural factors). Factors contributing to infant vulnerability to malnutrition and morbidity interact and become cumulative, causing retardation in the growth or, finally death of the child. Another classification of the above factors distinguishes the biological and the social (Norderberg et al., 1978). Some can be present in families of all social classes e.g. epidemics, instability among refugees and internally displaced people. However, if parents identify and recognise them, they can mobilise their resources to mitigate their effects.

a) Biological Factors

They are easy to understand and to identify because of their direct or immediate cause effect relationship

- Low birth weight including premature and twins, has been associated with increased prevalence of diarrhoea in some studies (Andrew and Watson, 1993).
- Short birth interval. The capacity of the mother to care for herself and for the baby is diminished. Even breast milk may not be enough to feed the new child.
- Child growth failure. If the child stops to gain weight during growth monitoring is a sign of growth failure.
- Aged between 6-59 months* children. Some authors, making emphasis on care practices suggest that during this period the major causes are not always the physical lack of food but also poor child feeding practices such as sub-optimal breastfeeding practices, poor

quality of complementary foods, detrimental feeding practices and contaminated foods (Longhurst and Tomkins, 1995).

- Repeated illness in the child or history of malnutrition in a sibling.

b) Social Factors

Their main effect is on development, education and emotional health. As the family is the basic social unit, factors that weaken it affect mostly child survival. The important ones in most societies are:

- Large family especially size with low income
- Marital status. Are likely to be malnourished children from one parent after divorce, disturbed behaviour, and abandoned parent.
- Leaving away from family, refugee without family, during period of class in institutions, if there is no person to share intimate memory.
- Illnesses such as physical and mental handicap.

Other risk factors are:

- Lifestyle e.g. a parent, who is an alcoholic, the decision-making is lacking.
- Deaths of parent especially of mother.
- Social deprivation e.g. immigrant or refugees and Internally Displaced Peoples. The cycle of deprivation can perpetuate from generation to generation so that parent who has not got chance may also penalise their children in depriving them to get basic needs. So there is perpetual crisis. discord or lack of tenderness.
- The level of education has also been found predictor of child nutritional status in many studies.

Infections

Like inadequate food intake, infections and other diseases are the common causes of infant mortality. The most important diseases here involved are diarrhoeal diseases, malaria, acute respiratory infections (ARI), measles, HIV and parasites (ACC/SCN, 1999). For instance by May 1999, it was reported among Sudanese and Somalis refugees in Ethiopia that CMR of 0.15/10,000/day and 0.08/10,000/day respectively while all beneficiaries received a complete food basket. Mortality was related to ARI, diarrhoea, and malaria.

- i) Diarrhoea is the commonest cause of infant mortality worldwide. It contributes to over more than 35% of deaths of infant aged 0 to 3 years in Gambia (ACC/SCN, 1993).
- ii) Malaria interacts with iron status because parasite requires iron for its multiplication in the blood. This leads to depressed immune response and susceptibility to infections. Around 1.5- 2.5 million children and adults die each year from malaria related causes. Between 90-95% of these deaths occur in Africa. It contributes to 5-10 % of infant deaths in Africa associated with low birth weight (Nurture, 1996).
- iii) Acute respiratory infection. The most commonly threatening child survival is pneumonia.
- iv) Measles: kills approximately 2 millions children a year (UNICEF, 1994). It interacts with protein energy malnutrition and vitamin A deficiency.
- v) Hookworm infestations. It is the cause of anaemia and decreases food intake in many places such as in Africa and south Asia.

2. 1. 3 Maternal attributes to child survival, growth and development.

Maternal health affects her ability to take care of the children. Physical and psychosocial problems can impact on her caring capacity. The environment in which people live can favour at different levels to empower the mother. HIV/AIDS is another challenge to the survival of both mother and children. In some African cities, up to 30% of pregnant women is HIV positive. Some biological maternal characteristics, which are risk factors to both maternal and child survivals, include the age at the first pregnancy (high risk for < 18 years old and for > 35 years old), Low weight and height of the mother (< 145 cm of height and < 45 kg of weight). In addition, poor health or nutrition reduces the ability of the mother to seek for preventive and curative cares for the children and for her. The death impacts on the family and affects household food, social and economic security. In Yemen it was found that in two third of maternal deaths, infants die within the same year. In Tanzania, low school enrolment in those families has been reported (Murray J. and al., 1998).

2. 1. 4 Care behaviours and practices

Behaviour is an action or set of actions that an individual carries out at a specific time. People's beliefs (what they think) and customs (what they do) are major factors influencing their behaviours. Some are good (e.g. breastfeeding up to 3 years); some are bad (e.g. thinking that it is dangerous to treat the child with measles before the rash comes out, that treatment may push it inside him, hence makes the condition worse) and other make no difference to health or are neither known to be harmful nor helpful (Jelliffe, 1985). It is important to consider them because they are tied to customs, which decide what

mother or caretaker does. Behaviour, that is an action or a practice is emphasised through a program intervention according to its impact on child health. Because children have more than one condition at the same time, it is important to manage all in order to prevent deaths from underlying conditions. Care behaviours refer to provision of time, attention and support, to optimal use of human, economic and organisational resources in order to meet physical, emotional, intellectual and social needs of the individual.

Childcare giving behaviours include breastfeeding, diagnosing illness, determining when a child is ready for supplementary feeding, stimulating language and other capacities, and providing emotional support (Longhurst and Tomkins, 1995). A caretaker is an individual who has the responsibility for care of a child. Often, it is her mother, older sibling, or other members of the community.

Therefore, care behaviours for the young child can be grouped into four:

- i) Feeding behaviours including breastfeeding and complementary feeding especially those related to frequency, amount and density.
- ii) Hygiene behaviours related to food, personal and home
- iii) Psychosocial behaviours including responsiveness, warmth, involvement and opportunity for learning
- iv) Health care behaviours such as health service utilisation and home care.

Feeding practices

Good feeding practices encompass use of appropriate food (quality, quantity and frequency) at the right time in taking into account the stage of development of the child.

Too early complementary foods, before 6 months carries the risk of increased morbidity due to diarrhoea and food allergies, as external challenges are introduced to the immature digestive tract, too late can lead to faltering growth, decreased immune protection and increased diarrhoeal diseases and malnutrition when exclusive breastfeeding become inadequate (ACC/SCN, 2001). Other factors affecting diet and feeding practices are food availability and usage of knowledge and beliefs of caretaker, availability of fuel, acceptability and avoidance of food (Mitzner et al., 1984).

Infant feeding should be considered in three overlapping periods: exclusive breast-feeding (EBF), complementary to weaning period and period of modified adult diet.

a) Breastfeeding practices.

Breastfeeding prevents approximately six millions deaths each year from infection diseases.

Until the end of the twentieth century, exclusive breastfeeding was recommended from birth up to at least four months, and if possible six months of age and complementary foods with continued breast feeding up to two years of age and older (Cameron and Hofvander, 1983, Chem and Taren, 1995, Helsinki and King, 1985, Lawrence, 1994, WHO, 1999; WHO, 2000). But a comprehensive resolution of World Health Organisation assembly adopted on infants and young child nutrition calls for exclusive breastfeeding for six months and for safe and appropriate complementary foods with continued breastfeeding up to two years of age or beyond (ACC/SCN, 2001). The progression from exclusive breastfeeding to solid food is based not only on nutrient requirement of the child but also on developmental maturation and environmental influences. Social network, ethnic factors, demographic factors have a role to play in the variation in breastfeeding

(Lawrence, 1994). For instance in a survey in Mozambique (DHS, 1999), it was found that for infants under five months, 38% were exclusively breastfed, 36% breast milk and water, 19% breast milk and solid food, 8% breast milk and other liquid and 4% weaned.

Referring to Kosovo crisis, Bhattia (1999), senior nutritionist for the office of UNHCR, stated that emergency situations amplify concerns about artificial feeding when 6000 feeding bottles had been donated. Health risks associated in camps with bottle-feeding and breast milk substitute are dramatically increased due to poor hygiene, crowding, limited water and fuel. It is the most cause of diarrhoea.

b) Complementary /weaning feeding practices

From six months of age and not later, the infant is introduced to complementary feeding. A staple food dense in calorie and with good digestibility is given. Other foods are added according to the progress rate of the infant. Initially one meal a day is given, then two times by about the age of six months, and four to six times over six months of age.

c) Complementary feeding period of modified adult diet.

By the time, the child approaches one-year he will be encouraged to feed himself and to receive a variety of both taste and texture, and food in his diet.

Hygienic practices

Care practices involve personal hygiene of the caretaker and the child. Unhealthy environment exposes to outbreak of infectious diseases and parasites dangerous to the child. Water, latrine and refusal disposals are also important for good development. Safe

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preparation of food and storage avoid spoilage of food by microorganisms, which cause gastro-enteritis. For instance high proportion of stunting of children under three years of age has been related to households using well and open water sources in Mozambique (DHS, 1999), 19 times than expected, and to households with no toilet facility. However, there was no correlation with wasting.

Health care practices

1. Use of available facilities

UNICEF estimates that one third of all births are not registered, increasing the likelihood that these children may be denied access to basics services and miss out on care and education, other still die from diseases that could be prevented (UNICEF, 2000). This consists in preventive and curative measures. Good practices consist in attending family planning, antenatal care, growth monitoring and immunisation both to mother and to the child and curative health cares.

2. Home management of child illnesses.

This tends to promote the capacity of the mother or caretaker at home level to recognise that the child is sick and to take appropriate measures before getting outside in order to prevent deterioration of the condition. It involves, for instance in case of diarrhoea of preparation and giving to the child solution of ORT and other home made solution.

When children must get outside home in need of integrated care to reduce their risks of dying from threatening condition, it implies the caretaker recognising that something is wrong with the child and accepting referral if necessary.

Psychological behaviours.

A better caring environment in terms of responsiveness, warmth, involvement and opportunity for learning can promote good health outcomes (Engle, 1992, Zeitlin, 1993). Language stimulation, teaching skills, active feeding and time devoted for watching over the child are some important aspects of good psycho-social care practices. Although many children have behavioural troubles such as bed-wetting, they require support than frustration. Mothers/caretakers also need community emotional support and responsiveness. Some factors like anxiety, lack of confidence, baby refusal etc. have been reported as reason of early discontinuing breastfeeding (Lawrence, 1994). The role of social network to support mothers in provision of care to children is also not negligible.

2.2 Gap in knowledge

In emergency nutrition the problem is often reported as a crisis of food, lack of funds and outbreak of infectious diseases (Longhurst and Tomkins, 1995). But when high discrepancy in health/nutritional status is found between different groups of population living under the same conditions, clear explanations are not always available about the matter. As for the case of Kibondo refugee camps, data on care are scarce and the role of childcare practices in the refugee camps in child survival, growth and development might not be well defined.

3. 1 Study setting

3. 1. 1 The area of study

Kibondo refugee camps are situated in Kibondo district, Kigoma region in northwest of the United Republic of Tanzania. Refugees are settled in five camps, which are along the main road between Mwanza and Kigoma. The farthest camps from the district head quarters are Mkugwa and Karago which are about 45 km north and south of Kibondo village respectively.

The district lies between $3^{\circ}15' N$ and $5^{\circ}00'S$ and $31^{\circ}30' East$ and $30^{\circ}30' West$. Kibondo is humid tropical climate with two seasons, the dry and the wet. The dry season (May to October) can be more or less longer than the wet season (November to April). The soil structure is reddish with good texture and water percolation but with little percent of clay content.

3. 1. 2 Population composition

The majority of populations in Kibondo camps are Burundians. Meanwhile mixed married families of Hutu, Tutsi and Congolese are found in Mkugwa camp, as the cohabitation might be impossible in other camps. Since October 1999, Burundians estimated at 80,000 persons have sought refugee status in Tanzania (ACC/SCN, 2000) adding to 260,000 already living in the camps. These numbers are not constant and depend on the instability in the region.

At the time of our survey, the population in Kibondo camps was estimated at 17,773; 42,760; 1,547 and 41,700 respectively for Kanembwa camp, Karago camp, Mkugwa camp and Mtendeli camp. Local farmers of “Ha” tribe populate villages surrounding the camps’ area.

3. 1. 3 Infrastructure and activities

United Nations High Commissioner for Refugees (UNHCR) and World Food Programme (WFP) are working with different implementing partners (Non Governmental Organisations) which are providing goods and services to refugees. Food items are supplied by WFP. The Tanganyika Christian Refugee Service (TCRS) and the Relief to Development Society (REDESO) manage the camp, food distribution, water and sanitation activities. Health and Nutrition services, in Kanembwa and Mkugwa camps are provided by UMATI while other camps (Karago, Mtendeli and Nduta camps) are serviced by the International Rescue Committee (IRC). Health services are provided free of charge not only to refugees but also to Tanzanians. Other NGOs operating in the camps are the Deutscher Relief Agency (DRA), the Jesuit Refugee Service (JRS) and the United Nation Children’s Fund (UNICEF). The activities carried out by these organisations range from the above mentioned to community services, environmental education and protection, tracing and family reunification for separated children, rehabilitation for physically and mentally disabled and Service for Gender Based Violence (SGBV).

In the camps, infrastructure varies according to the duration of the camp from the permanent construction in bricks to temporary tents provided by UNHCR (UMATI, 2000). Material for construction of latrines (pit latrines) is also provided to refugees.

Each camp has one hospital and two or more out reach posts for provision of health cares; and one or more nursing, primary and secondary schools for children education. Piped water is available in various points of the camp. There are markets in the camps and refugees meet with local population in a common market for exchange of goods once a week. Most of refugees have no access to agricultural land and hence are totally dependent on the ration provided by WFP and its donors.

At the time of the survey, the ration per person distributed every 14 days was approximately as follows: 246 grams of maize grain or 210 grams of maize meal, 96 grams of pulses, 32 grams of Corn Soyaa Blend (CSB), 16 grams of vegetable oil and 80 grams of salt. All the camps were accessible by roads. Table 4 below shows some nutrient contents of the food ration.

Table 4: Approximate nutrients composition of food ration distributed to refugee in Kibondo camps- Tanzania (November 2000 to December 2001) and percentage of fulfilled recommended allowances (RDA) for children aged two years and below.

Maize meal based ration ^a			Maize, whole yellow based ration ^b		
Nutrients	Quantity	% RDA	Nutrients	Quantity	% RDA
Energy	1327.0 kcal	67.8	Energy	1481.1 kcal	75.6
Protein	46.4 g	80.2	Protein	51.5 g	89.0
Vitamin A	214.6 µg	35.8	Vitamin A	381.4 µg	63.6
Vitamin B1	1.4 mg	353.5	Vitamin B1	1.7 mg	417.4
Vitamin B2	0.5 mg	130.0	Vitamin B2	0.5 mg	137.2
Vitamin C	19.1 mg	34.7	Vitamin C	20.2 mg	36.7
Calcium	471.9 mg	118.0	Calcium	478 mg	119.5
Iron	19.6 mg	245.2	Iron	21.1 mg	264.1

a: Maize meal based ration: 210 grams of maize meal, 96 grams of pulses, 32 grams of Corn Soya Blend (CSB), 16 grams of vegetable oil and 80 grams of salt, while in

b: Maize yellow based ration: 246 grams of maize grain is substitute of 210 grams of maize meal.

3. 2 Research methodology

3. 2. 1 Study design

This study was a cross sectional study conducted between November 2000 and February 2001. Both qualitative and quantitative methods were used to collect data and to understand the influences of care practices on the nutritional status, growth and development, morbidity and mortality of refugee children in Kibondo camps.

A pre-tested questionnaire with pre-coded and few open-ended questions was administered to mothers of children aged 6-24 months by trained enumerators followed by one time observation (Appendix 1).

The study population consisted of the children aged 6-24 months in four Kibondo refugee camps and their mothers/ caregivers. The majority of respondents were Burundians of Hutu ethnicity.

3. 2. 2 Method of sampling

Random stratified sampling was used in selecting the study sample. Each camp was taken as a stratum. The number of individuals in each camp derived from the total sample size and was proportionate to the relative prevalence of malnutrition of sampled camps adjusted according to the population of the strata. In each stratum, the selection of households was randomly done.

3. 2. 2. 1 Sample size determination

The sample size was obtained using the formula for cross sectional study (Fisher et al., 1991).

$$n = \frac{z^2 pq}{d^2}$$

Where n= the desired sample size (when population is more than 10,000)

z= standard normal deviate , actually set at 1.96 which corresponds to the 95% confidence interval.

p= proportion of acute malnutrition (wasting) in the four sampled camps of the five existing in Kibondo district. estimated in July 2000 at 3.7%

q= 1-p = proportion of population considered well nourished (weight for height z-score).

d= degree of accuracy desired. actually set at 0.05

After substituting those values in the above formula and multiplying by two, the sample size becomes 364 children-mother pairs inclusive 10 % of extra to cover for attrition that may occur (Fisher et al., 1991). The sub-sample for 24-hour recall was 60 households, which is more than the minimum sample size recommended (Fisher et al., 1991).

3. 2. 2. 2 Sampling procedures

Four camps out of the five existing in Kibondo district were randomly selected for the study. The number of households in each camp was calculated proportionately to the corresponding rate of malnutrition and adjusted according to the total population. The sub-

sample from a camp was calculated from the total sample size (n=364) times prevalence of global wasting in that camp divide by total cumulative proportion of wasting in the four camps. Then the sub-sample was adjusted based on balance of population size and need for statistical analysis i.e. low prevalence of malnutrition needs increase of sample size and minimum reliable sample size for analysis is 60 (Fisher, 1991). Table 4 presents the details showing how the number of sampled households derived from each camp.

Table 5: Sub-sample size of the study population derived from each surveyed camp.

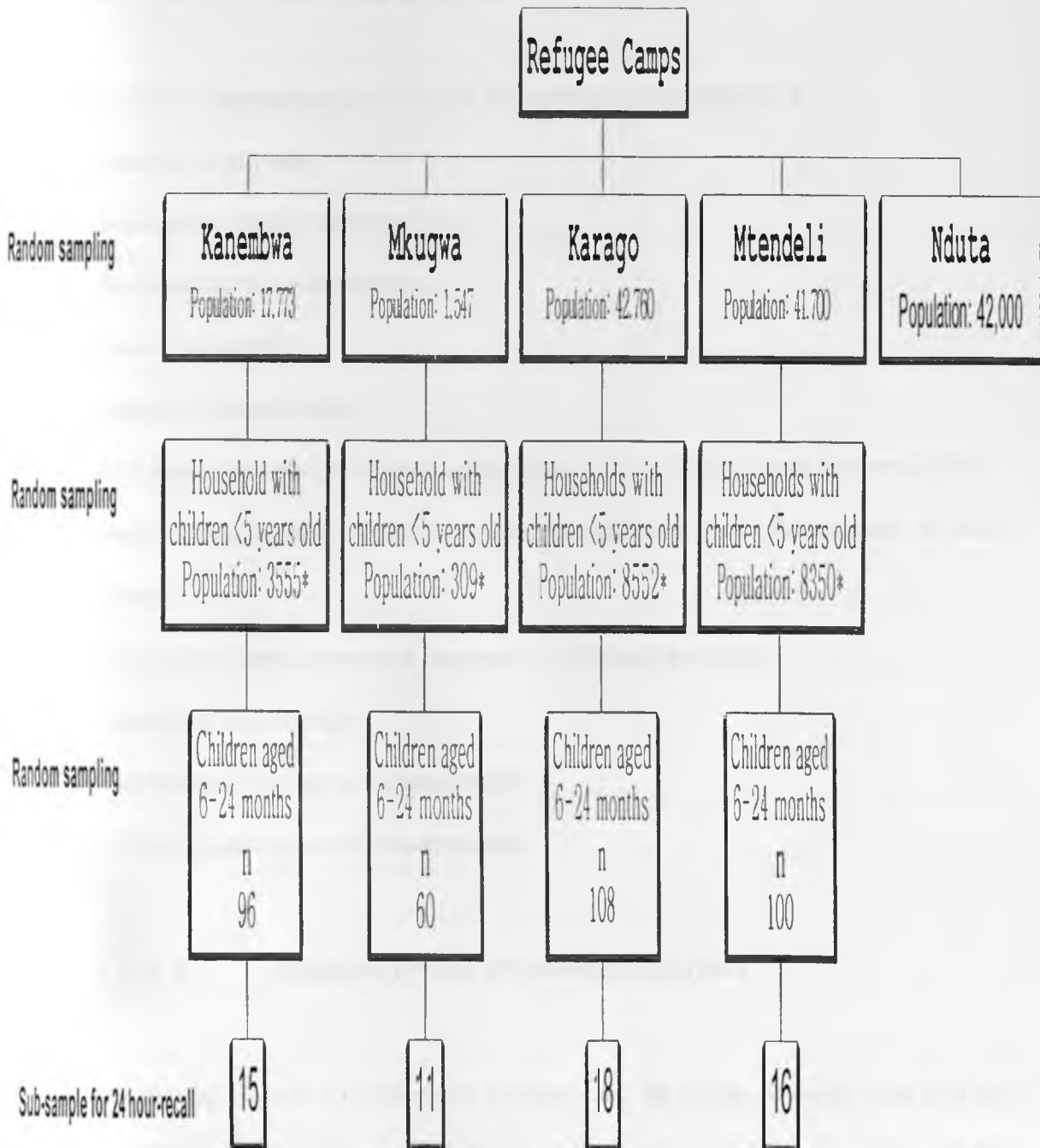
Camp	Global wasting	Cumulative %	Sample size ^a	Adjusted size
Kanembwa	3.6%	3.6%	92	96
Mkugwa	2.0%	5.6%	51.2	60
Mtendeli	3.3%	8.9%	84.6	100
Karago	5.3%	14.2%	135.8	106
Total	3.7%	14.2%	364	364

^a computed from the total sample size (n=364) times global wasting divided by total cumulative%.

During the selection of households, the inclusion criteria were: children aged 6-24 months with their caretakers/mothers who were de facto residents in the camp (i.e. if a child came with the caretaker/mother to visit a family in the camp, he was excluded from the study).

The exclusion criteria: children with physical or mental condition predisposing to malnutrition or children who were attending supplementary or therapeutic feeding within the last month prior to the survey. Households, which did not have children aged 6-24 months were also excluded. Households were selected randomly for interviews in each bloc. The families were contacted and once the consent obtained by the respondent, the observer started immediately the interview. Figure 1 shows the sampling procedure.

Figure 1: Flowchart showing the sampling procedure



* Represents 20% of the total population as under five years old assumed in emergencies when the proportion is unknown.

3. 2. 3 Research instruments

The study used a questionnaire, which had ten sections (see Appendix 1):

1. General survey data
2. Socio-demographic characteristics
3. Socio-economic characteristics
4. Food consumption
5. Maternal characteristics
6. Childcare characteristics (feeding practices, water, sanitation and hygiene, psychosocial characteristics, health care characteristics and home management of child illness)
7. Caregivers identification and frequency of childcare activities,
8. Morbidity and mortality
9. Growth and development characteristics
10. Children anthropometric measurements.

3. 2. 4 Implementation of research activities

The research was cleared at the Ministry of Health and the permit obtained from both the Ministry of Home Affairs Tanzania (MHA) and United Nations High Commissioner for Refugees (UNHCR). During the first visit, the researcher introduced himself to officers of MHA, UNHCR and other agencies working in the camps. Later, contact was made with community leaders and health workers for recognisance and for explaining the purpose of the study.

Recruitment and Training of field assistants

Fourteen enumerators, six females and eight males were recruited from social and community health workers of UMATI- refugee Programme and International Rescue Committee (IRC). They formed four teams for the four camps. The two nutritionist officers of the two organizations (UMATI and IRC) helped to select enumerators among the most experienced, based on prior familiarity with taking anthropometric measurements. They were Burundians with good command of Kirundi, Kiswahili, French and English. The team leaders had completed secondary education and their assistants had between four and six years of post-primary education. All were refugees living in the camps. Each team collected data in its residential camp because of logistic constraints.

The principal investigator trained the field assistants for two days about the purpose of the study, the use of the survey instruments, interview techniques and procedures of data collection. Prior to pre-testing a refresher exercise was done during two days on how to administer the questionnaire, to take recumbent length/height of children and dietary measurements of food intake.

An independent nurse, who was not an enumerator, translated the questionnaire into Kirundi. Then during training and pre-testing, the teams did necessary modifications.

Pre-testing of the study instruments was done to examine the suitability of the questionnaire with the study audience and the appropriateness of scales and height/length measuring boards. The questionnaire was administered to mothers and measurements taken in 20 households in which were found children aged 6 to 24 months. These questionnaires were not included in the final analysis. Then the questionnaire was reviewed and field assistants retrained.

Equipment

Fourteen new hanging Salter scales of capacity of 25 Kg with precision of 0.1 Kg, obtained from UNICEF Kibondo Field office were used for measuring weight of the children.

Fourteen new height/length-measuring boards, obtained from UMATI-refugee programme, with precision of 0.1 cm were used to measure recumbent length and height of children.

Fluid measuring cylinders graduated in millilitres of capacity 1000 ml, 500 ml and 100 ml, were used for assessing food intake.

Data collection

Three different techniques were used: interview, observation and measurements.

The interview was done to the primary caretaker, the one who spend the most time with the child or to the mother. Most data, the socio-demographic, the socio-economic, the childcare activities were obtained by asking questions to the respondent.

For some of the information, a combination of the three techniques mentioned above was necessary to ensure reliability. The age of the child (date of birth), immunization and growth monitoring attendance were recorded from the child's health card. The enumerator counted the total number of teeth the child had and observed general cleanliness of the child and caretaker. Measurements were done for anthropometry (length/height, weight) and for quantitative food intake using appropriate materials and techniques as described below.

Anthropometric measurements:

Length/height

The recumbent length was obtained for all children under 24 months old lying on their back without foot or headwear while vertical height for all children aged 24 months was measured. A special length/height measuring board obtained from UMATI/UNHCR refugee Programme was used to take measurements. The device had a stationary headboard and a moveable footboard. Its measuring scale in millimetres had a zero at the edge of the headboard to allow the length to be read from the footboard.

Two enumerators held the child lying or standing, his/her back against the board. The first enumerator held the child to ensure that the child was placed in Frankfort plane with the crown touching the headboard, the child buttock touching the backboard, and shoulders and hips at right angles to the long axis of the body. While the second enumerator kept the legs straight against the backboard, sliding the footboard against the bottom of the feet with toes pointing upward. He also read the measurements to the nearest 1 centimetre and recorded. Two measurements were taken for each child and the average computed during data processing made the actual height of the child (as described by Lee and Nieman, 1986).

Weight

The weight was obtained by weighing the children in the nude using Salter scales of 25 kg of capacity. All scales with the pants hanging on them were adjusted to zero before weighing the child. The child was suspended on the scale and two readings were done to the nearest 0.1 kg. Two successive readings were recorded and the mean of them determined and considered as child's actual weight. The weighing procedure followed is as described by Lee and Nieman (1986).

Diet intake:

Qualitative food intake was obtained by asking the respondent to remember the frequency of consumption of the main categories of food items by the child (**Appendix 1, section 4**). Quantitative dietary measurement was done for all food consumed by the child. The interviewer asked the respondent to recall in detail all food and drinks consumed by the child during the 24-hour period preceding the survey. The method followed is as described in Lee and Nieman (1986). Mothers/caretakers were asked to recall the time the meal/food was eaten, the name of dish and ingredients in the family meal. Then they were asked to estimate quantities of the mentioned ingredients used to prepare the dishes including water for cooking. The amount of food consumed by child derived from the quantity of food served to the child and leftovers. The ratio of the food consumed by the child and the total amount of the family meal was used to derive the actual weight of an ingredient intake from that food. For instance if 500 grams of flour and 100 grams of sugar were used to prepare porridge of 1500ml which the child ate 300 ml, then the actual amount of intake is 100 grams of flour and 20 grams of sugar respectively (ratio=1/5). In order to facilitate quantity estimate, different measuring cylinders 1000 ml and 500 ml, obtained from UMATI and IRC were used to standardise household measures of food in volumes. Then conversion of volumes of foods into grams was done as described in Mitzner et al., 1984; Cameroon and Hofvander 1983 before computerized analysis aimed at assessing nutrient intakes (protein, energy, vitamin A, vitamin B1, B2, vitamin C, calcium, iron and zinc) and fulfilment of recommended daily allowances was done.

Morbidity and mortality

Data on morbidity was obtained by interviewing the mother/caretaker to recall any incidence of illness of the index child during the two weeks prior to the survey and to indicate the type of illness.

Retrospective mortality data was also obtained by asking the mother about the number of children under five years old who had died in her household since she had been in the refugee camp (see **Appendix 1, Section VIII**). In another section on maternal characteristics (**Appendix 1, Section V**) the mother was asked the number of her children under five years old who had died in her lifetime.

Growth and Developmental traits

Collection of data on weight and height has been already explained in the section on anthropometric measurements. Actually the following details refer to dentition and developmental milestones as shown in **Appendix 1 Section IX**.

The mother/caretaker was asked to recall the total number of teeth that the child had, then the enumerator verified by counting them. The actual milestone of the three selected development skills namely sitting without support, crawling and walking a few steps was observed and retrospective time of achievement recalled by the mothers.

Validity and reliability

The validation of the questionnaire was done through pre-testing. Field assistants were closely supervised during pre-testing and data collection. To reduce errors due to memory lapses, probing questions were asked to the respondent. Before leaving one household for

another, each completed questionnaire was checked to ensure that correct and consistent answer were given. Health cards were used to check the exactness of the reported immunisation status, growth monitoring attendance and date of birth of the child. New height/length boards and scales (adjusted to zero before weighing the child) were used to reduce instrumental errors.

3. 2. 5 Data entry, Cleaning and analysis

Data entry, cleaning and analysis was done using the following software programs:

- a) Epi-Info 2000 (version 1.0) was used to convert raw anthropometric data (weight and height/length of 364 children) into anthropometric indices of z-score, which were used for nutritional status classification. The NCHS/WHO (1977/85) reference values were used. The program was also used to compute the 95% confidence intervals of proportion of different variables of the study.
- b) Nutrition survey software (Update 2000) was used for data entry, plausibility check of data, data cleaning and for conversion of raw data of 24-hours recall food intake to nutrients and to assess the fulfilment of requirements. The international food (FAO/ WHO) database software was selected as a reference for nutrient composition of foods. For local foods consumed, additional foods with reference to East-African food composition Table were added.
- c) The statistical package for social scientists (SPSS, version 8.0) was mainly used for data analysis. Descriptive statistics, comparison between means and proportions of different variables of childcares and attained growth or nutritional in households were done by assessing the significance levels at 0.05 of chi-square test, student t-test. Coefficients of correlation of nutritional indices, developmental skills and

number of deaths as dependent variables with childcare continuous variables (frequency of childcare activities, age and time variables) as independent variables were computed with their level of statistical significance. Odd-ratios were applied to test for the risk estimation of malnutrition and sickness incidence due to poor childcare practices.

Graphs were plotted using SPSS program.

Means and proportions were given with their corresponding 95 % confidence intervals that define range within which the variable that is being estimated is likely to lie.

Variable indicators

Outcome measures (dependent variables).

The outcome measures for the study, also considered as dependent variables, were the nutritional status, attained growth and development, morbidity of the children and mortality experience of the households.

- **Nutritional status**

Anthropometric measurements of weight and length of all children aged 6-24 months were converted into z-score indices of height for age, which measures the status of long term malnutrition or stunting; weight for height, which can reflect acute malnutrition or wasting; and weight for age, which measures both acute and chronic malnutrition or underweight.

- **Attained growth and development**

Selected variables were used as measures of attained growth and development: the length/height and weight of the child, the total number of teeth for age (slope of dental

eruption), and three developmental skills (sitting without support, crawling and walking a few steps). To avoid the confounding effect of age of the child on dental eruption, the slope of dental eruption was computed using linear model referring to Bennett's assumption (1985):

$y = a + bx$ (where y =age in months, a =intercept, x =number of teeth, and b =slope). Therefore the formula for the slope was $b = (a - y) / x$ here i.e. the slope of dental eruption equals intercept minus age of the child (in months) divided by number of teeth.

- **Morbidity and mortality**

The incidence rate and type of illness of the index child and mortality experience of children under five years old in the household were indicators used to characterise morbidity and mortality.

Exposure measures (independent variables).

Proximal independent variables pertained clusters of social demographic and economic characteristics, food consumption, care support niche and components of childcare, which were feeding behaviours, water, sanitation and hygiene, use of health care services and emotional care giving behaviours.

- ***Childcare practices:*** Four clusters of childcare practices were identified.
 - Feeding practices (breastfeeding, complementary feeding and weaning)
 - Hygiene practices (physical cleanliness, water, sewage and garbage disposal).
 - Health care practices (family planning, antenatal care attendance, growth monitoring attendance, immunization, curative health care and home management of child illness).

- Psychosocial practices (teaching skills to the child, emotional support and stimulation).
- **Adequate childcare arrangement** was based on type of arrangement the mother reported as alternative caretakers in case she was away from the child and was considered adequate if the mother worked at home while watching over the child or left the child with an adult caretaker while inadequate care referred to an arrangement when the mother was away from home with the child or left the child with a preteen caretaker (Lamontagne et al., 1998).
- **Household wealth:** The household wealth was computed by considering household durables and items. Selected household assets and items constituted the elements used for calculation. The wealth scale was constructed by giving two points for the bicycle, as it was a means of production in the camp; one point for radio, one point for radio cassette and half a point each for latrine, refuse pit, hanging line and dish rack (see **Table 5a**).

Table 6a: Household wealth scores

Household wealth	Score
Own a bicycle	2.0
Own a radio	1.0
Own a radio-cassette	1.0
Own a latrine	0.5
Own a refuse pit	0.5
Own a laundry hanging line	0.5
Own a dish rack	0.5
Total	6.0

- **Frequencies of childcare activities:** Frequencies of five different childcare activities namely cooking food, washing child's body, washing clothes, changing clothes and

frequency of consumption of food were converted into scores of daily factor's activities (See **Table 5b**). Activity that was performed once per day has a score of 1, twice per day a score of 2, once per week a score of 0.1428 (that is $1/7$ days); never a score of 0 and occasionally a score 0.017 (i.e. the average of never performed and once per week).

Table 6b: Frequency of childcare activities scores

Frequency of childcare activities	Score
Twice per day	2.000
Once per day	1.000
Once per week	0.143
Occasionally	0.017
Never	0.000

- **Physical cleanliness score.** The mother/caretaker and the child cleanliness or appearance was obtained in giving point 1 when the characteristic poor hygiene was found during observation and Zero when it was not observed (1 =yes and 0=No) So that high score meant poor physical appearance and hygiene of the child or caretaker (See **Table 5c**).

Table 6c: Physical cleanliness scores

Physical cleanliness	Score
Dirty clothes	1
Unwashed face	1
Unwept nose	1
Unkempt hair	1
Dirty hair	1
Total	5
Grade:	5
Very dirty	5
Very clean	0

CHAPTER FOUR: RESULTS

4.1 Description of the study population

4.1.1 Socio-demographic characteristics

The study sample consisted of 364 households with a total population of 1,488 in four Kibondo camps of refugees: 26.4% in Kanembwa camp, 16.5% in Mkugwa camp, 29.7% in Karago camp and 27.5% in Mtendeli camp. The majority of residents in the camps were Burundians (93.4%), a small proportion of Rwandans (5.8%) and Congolese (0.8%) were found in Mkugwa camp. They all had lived in the camps for an average time of 38 months (ranging from one to 93 months). Table 6 shows some socio-demographic characteristics of the study sample.

The average household size was 5.2 people with an average of 2.5 children under the age of five years. The average age of the children was 14.6 months with a minimum of six months and a maximum of twenty-four months. The proportion of boys (54%) was not significantly higher than that one of girls.

The majority of mothers (73.9%) were legally married while 15.7% were living together with a male partner not based on legal marriage but in mutual arrangement. The remaining 10.4% were single, divorced or married but not living with the husband.

Table 7a: Some socio-demographic characteristics of the study sample.

Socio-demographic characteristics	Mean \pm SD	Range	Median	
Number of children under 5 years age	2.52 \pm 1.68	1-5	2	
Household size	5.21 \pm 1.78	2-9	5	
Duration in the camp (months)	38.02 \pm 26.70	1-93	37	
Sex of children	N	%	χ^2	p-value
Boy	198	54.4		
Girl	166	45.6		
Total	364	100	2.813	0.093
Sex of household members	N	%	χ^2	p-value
Male	750	50.4		
Female	738	49.6		
Total	1488	100	0.19	0.660

χ^2 : chi square test

The education level was low with less than 20% of adults who have attended one or more years of secondary education. More than half (56.2%) of the females had 1-6 years of schooling and 14 % of them had 7-12 years of schooling. Compared to men, women had significantly (p-value <0.001) higher rate of illiteracy (not attended school) and a lower level of post-primary education (Table 7). Christians comprised the majority of the population (89.8%).

Table 7b: Distribution of adults according to attained education levels and sex.

	%Male	%Female	χ^2	p-value
Education level of adults				
Not attended school	17.6	29.8	41.17	0.00002**
1-6 years of schooling	59.4	56.2	2.10	0.1470 ^{ns}
7-12 years of schooling	23	14	26.27	0.00003**
	100	100	34.629	0.00002**

** significant at 0.01 ns: not significant

4. 1. 2 Socio-economic characteristics

Variables of socio-economic characteristics of the study population are given in Table 8.

About two third (60.7%) of the population's shelters were made of wood-mud wall and grass roof while close to a quarter (22.6%) had bricks wall. The remaining houses were tents or had a mixture of wood-mud-bricks-grass. Assets reported in households were a radio (by approximately half of the households), a bicycle (more than a third of households) and a radio cassette player (less than ten percent of households). Basic items for ideal hygiene observed in the household were present in more than two thirds of households. Those items are hanging line for clothes observed in close to two thirds of households, dish rack in about three quarters of households, refuse pit and latrines observed in higher proportion of households. The source of income in the camp was casual labour and small business in slightly more than a quarter of households followed by employment and subsistence farming.

Only one percent of the population had received gifts (in kind or money) from the other members of the community. About twenty percent of adult household members had been contributing money to the household. The main source of cooking energy (based on what was used on the day preceding the survey) was wood collected. This was reported by about three quarters of the households. The remaining (slightly more than a quarter of households) used wood or charcoal purchased or charcoal collected for cooking.

Table 8: Socio-economic characteristics of the study population

Socio-economic characteristics N=364	n	% Households
Bicycle	139	38.3
Radio	165	45.3
Radio cassette	34	9.4
Hanging line for clothes	223	61.3
Dish rack	276	75.9
Refuse pit	327	89.7
Latrine	358	98.4
Cooking fuel used in the household		
Wood collected	269	74.0
Wood purchased	54	14.7
Charcoal collected	6	1.5
Charcoal purchased	31	8.6
Others	4	1.2
Source of income of the household		
Salaried/employed	56	15.4
Casual labour	104	28.6
Small business	93	25.5
Farming	48	13.1
Others	63	17.4
Quality of shelter		
Wood - mud wall with grass roof	221	60.7
Brick wall with grass roof	82	22.6
Mixed brick and mud wall with grass roof	18	5.0
Tent complete or with mud wall	43	11.7

4. 1. 3 Food consumption in households.

The number of days the food distributed lasted was on average nine days (8.85 ± 2.16). Almost all households (94.4% with 95%CI: 91.3%-96.5%) experienced food shortage during at least the month before the survey. As a coping strategy, a little below two thirds

(59.1%) of the households purchased their food, slightly less than a quarter (20.1%) worked for food, slightly more than ten percent relied on borrowing, while 5.1% and 3.7% respectively reduced the number of meals taken per day and the quantity of food in family meal (Table 9).

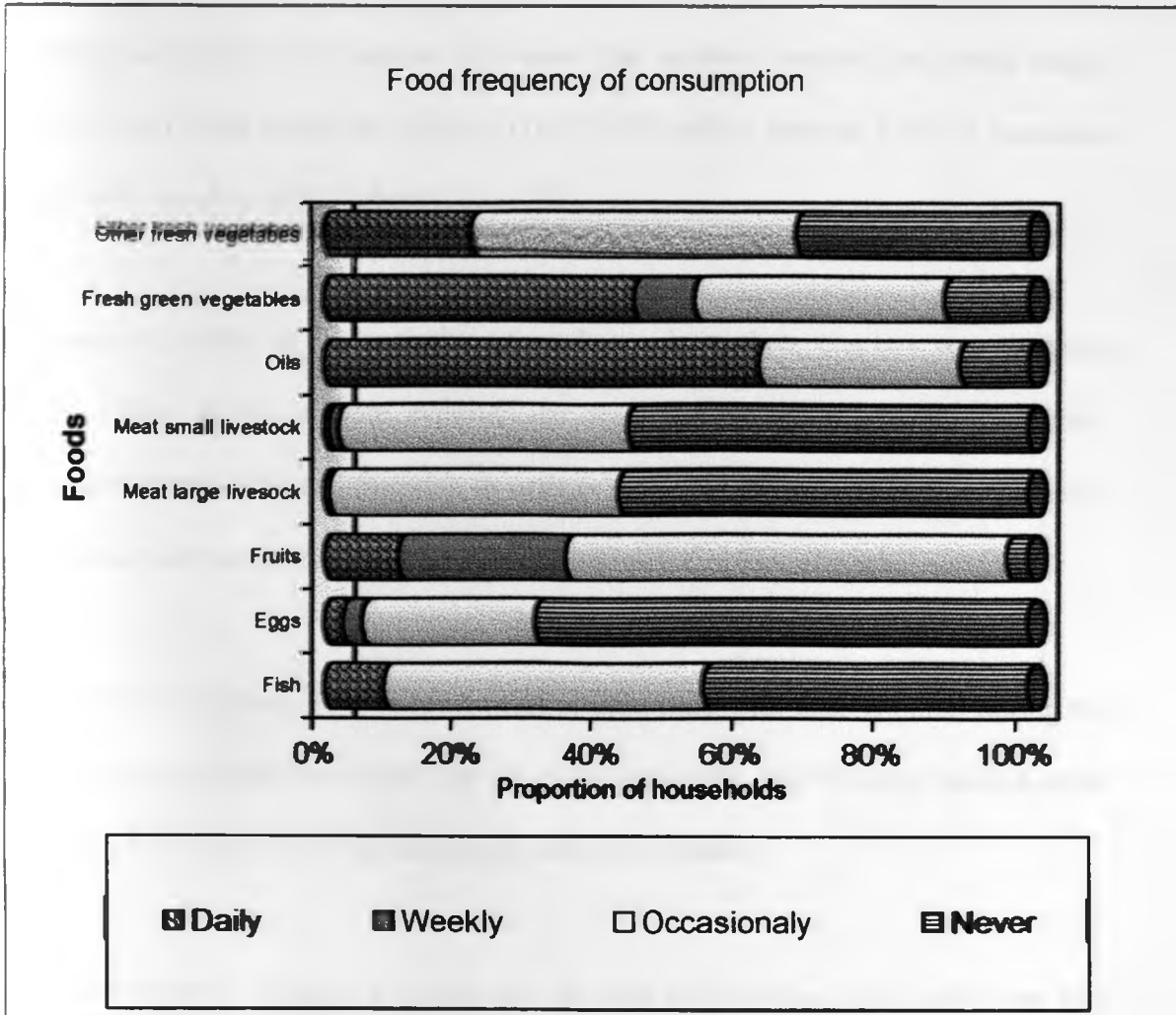
The food score ranged from 0 - 2.0 (never consumed to more than once a day). The frequency of food consumption from animal origin was very low except for fish and seafood. The succession in order of frequency of consumption was as follows: 1) Oils / 2) Fresh green leafy vegetables / 3) Other fresh vegetables / 4) fruits / 5) fish and sea food / 6) eggs / 7) meat small livestock / 8) meat large livestock.

Table 9: Coping strategies during period of food shortage at household level in the camps.

Coping strategy	n	%
Purchase food	215	59.1
Work for food	73	20.1
Reduce number of meals	20	5.5
Reduce quantity of food in the meal	14	3.7
Borrowing	42	11.6
Total	364	100

Figure 3 shows the distribution of households by frequency of food consumption of the index child in Kibondo refugee camps.

Figure 3: Distribution of households by child frequency of food consumption.



4. 1. 4 Maternal characteristics

The average age of the mother was 27.1 ± 6.4 years with an average of 19.6 ± 2.2 years at first birth and an average number of 2.6 ± 1.7 living children per mother. Slightly less than a quarter of mothers (23.8%) had experienced the death of one or more children. Maternal characteristics are presented in Table 10.

Close to a half of mothers (47.3%) received full support from the household head while about a quarter (25.3%) received partial support. A small proportion of households did not have financial support. The amount of money the mothers received per week ranged between 50 and 5000 Tanzanian shillings (10.00 US\$) with a mean of 1261.28 Tanzanian shillings and a median of 500 (about 0.625 US\$).

The principal activity of the majority of mothers, about three quarters was domestic services. Other activities were reported by small numbers of households namely employment, casual jobs and business or artisan works. Mothers worked at home, away from home or combined home and away from home as their place of work.

The majority of mothers (81.6%) spent most of their time with their children during the day. About 15.3% of mothers spent four to eight hours with their children while a small proportion (3.1%) spent less than four hours with their children.

The mother adopted different strategies for the care of the young child while she was working. More than three quarters of the mothers (78.9%) stay at home or take the child at their place of work. Less than a quarter (14.3%) of the children were left under the care of children under the age of thirteen years and less than ten percent (6.8%) were left with adult caretakers. During the time of the survey, 7.1% of mothers were pregnant most of them below five months.

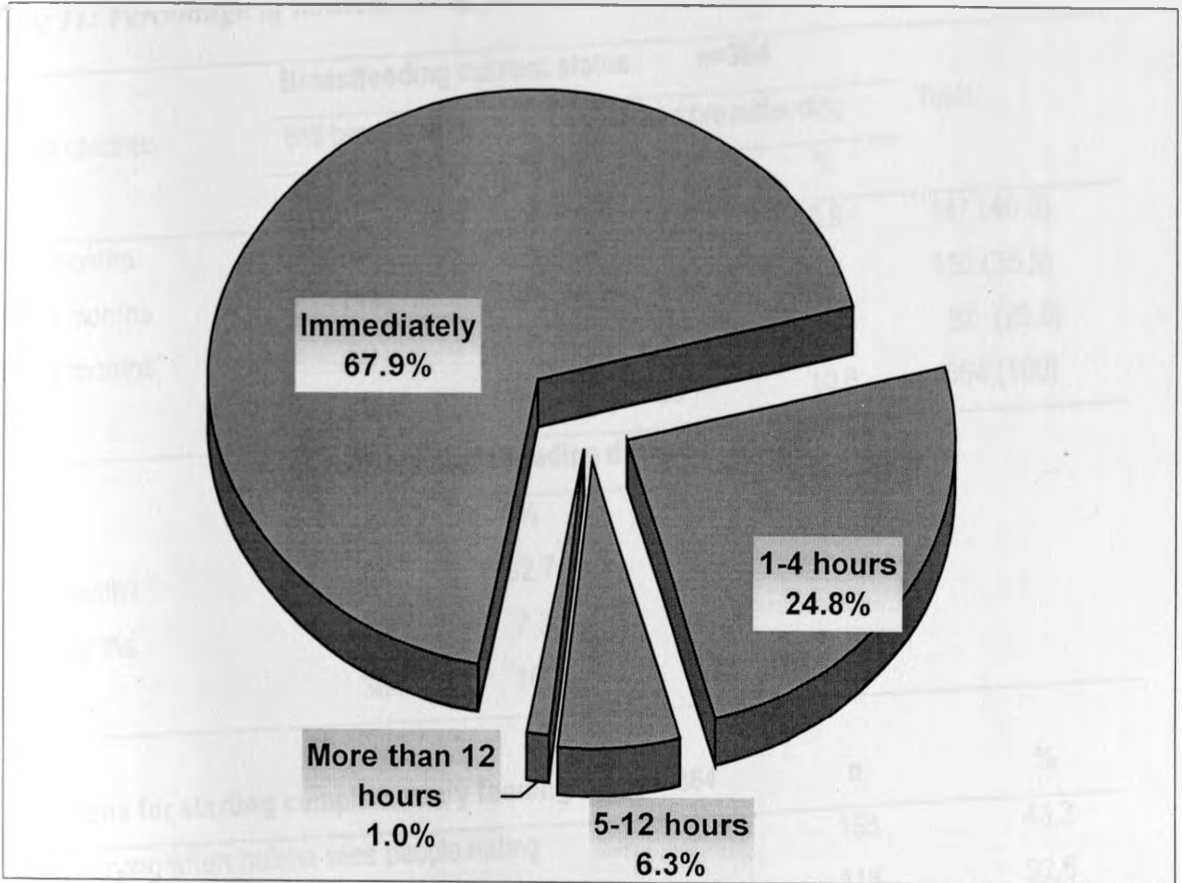
Table 10: Maternal characteristics of the study population

Maternal factors	Mean \pmSD N=364	Min-Max
Age of mother	27.06 \pm 6.39	17-48
Age of mother at birth of her first child	19.55 \pm 2.23	14-28
Number of cases of child birth spacing of less than 2 years	1.38 \pm 0.57	0-3
Amount of money father gives per week (Tanzania Shillings)	1261.28 \pm 1120	50-5000
Proportion of mothers	n	%
Proportion of pregnant women	27	7.1
Experienced death of her children in her life	87	23.8
Father financial support to mother		
Everything	172	47.3
Partial	92	25.3
Nothing	77	21.1
Father absent	23	6.3
Care arrangement of mother if working		
Child stays with mother at home	117	32.1
Take child with at work	170	46.8
Leave child with an adult caregiver	25	6.8
Leave child with a under 13 years child	52	14.3

4. 1. 5 Feeding practices

In this section were examined breastfeeding and complementary feeding practices (Tables 11). The majority (89.2%) of children in the study population were still breastfeeding while 10.8% were weaned. Close to two thirds of the mothers (66.7%) reported that they initiated breastfeeding immediately after delivery (less than one hour), about a quarter (24.5%) between 1-4 hours, 5.8% between 5-12 hours, 1% beyond 1 day while 1.4% did not remember the exact time at which breastfeeding was initiated (**Figure 4**).

Figure 4: Time of initiating breastfeeding after delivery



About 9.1% of the mothers reported to have given some other fluids to their children the first seven days after birth. The types of fluids given were sugary water by slightly more than a half (56%), warm water by about 16%, porridge, 12%, cow milk and others, 16%.

The average time of exclusive breastfeeding was 4.8 ± 1.3 months and the majority of children (92.7%) were exclusively breastfed for a period of 0-6 months. Reasons which led mothers to introduce supplementary feeding were: observing baby crying when he/she saw other people eat that was reported by about half of mothers; habit to introduce other foods at that age to the child, reported by about a third; beliefs that milk is not enough and other reasons (mother sick or at work) reported by 10.4%. The number of meals taken by the child was on average 3 ± 0.9 .

Table 11: Percentage of households by feeding behaviours.

Age of children	Breastfeeding current status n=364				Total
	Still breastfeeding		Stopped breastfeeding		
	n	%	n	%	
6-12 months	146	99.2	1	0.8	147 (40.3)
13-18 months	119	91.6	11	8.4	130 (35.9)
19-24 months	60	69.0	27	31.0	87 (23.8)
Total	325	89.2	39	10.8	364 (100)

	Exclusive breastfeeding duration n=364	
	n	%
0-6 months	337	92.7
>6 months	27	7.3
Total	364	100

Reasons for starting complementary feeding	N=364	n	%
Baby crying when he/she sees people eating		158	43.3
Habitual time to introduce food to the child (habit/custom)		118	32.5
Beliefs that breast milk is not enough (i.e. not yet habitual time)		50	13.8
Mother sick or mother at work		38	10.4

Quantitative food intake of children in refugee camps

The mean energy intake was 835.9 kcal. Almost three quarters (72.1 %) of the children did not meet fifty percent of their daily-recommended allowance (RDA). The mean protein intake was 34.25 g with 26.2% of children who did not meet fifty percent of RDA. The majority of children fulfilled their RDAs of vitamin A, thiamine and iron. About half of them (54.1%) fulfilled their riboflavin RDAs. Only forty percent took enough vitamin C, 34.5% for calcium and 20% for zinc (Table 12). The major source of vitamin A was the Corn-Soyaa Blend distributed as part of the ration. Cereals and pulses constituted the main sources of thiamine and iron.

Table 12: Nutrient intakes and fulfilment of Recommended Daily allowances of children.

Macronutrient intake	n=60	Mean \pm SD	Median
Energy (in Kilocalorie)		835.90 \pm 266.67	858
Protein (in grams)		34.25 \pm 11.52	33.5
Proportion of children who fulfil RDAs	n=60	n	%
Fulfil less < 50% RDA of energy		43	72.1
Fulfil less < 50% RDA of Protein		16	26.2
Fulfil Vitamin A recommended daily allowance		56	93.4
Fulfil Vitamin B1 recommended daily allowance		56	93.4
Fulfil Vitamin B2 recommended daily allowance		32	54.1
Fulfil Vitamin C recommended daily allowance		26	42.6
Fulfil calcium recommended daily allowance		21	36.1
Fulfil iron recommended daily allowance		52	86.9
Fulfil Zinc recommended daily allowance		12	19.7

4. 1. 6 Water, sanitation and hygiene

About a quarter of households reported that they did not have enough water for daily use. The average quantity of water fetched in the 48 hours prior to the survey was 104.5 \pm 66.4 litres with a median of 80 litres. The water was stored in plastic containers by most households, in clay pots and metallic containers by a few (i.e. 6.7% and 1% respectively). The rest (about 10.4%) stored their water in more than one of the types of containers given above. Slightly less than a half of households did not store water for drinking and for other use in separate containers while almost an equal number used different containers to separate not treated water for drinking and for other use. Only 16.2% stored boiled drinking water in containers separated from those for other use. Data on water is presented

in Table 13. Except for metallic containers and some plastic containers, water stored for drinking and for other use was covered.

Most households (94.3%) disposed off garbage and kitchen waste in rubbish pit (94.3%) while 3.8% and 0.8% of the households buried or burned the waste respectively. Sewage (e.g. child's faeces) and related waste were disposed off in the latrine by nearly half of the households (48%). About a quarter (22.8% and 27.5%) respectively disposed off it in a refuse pit or in the garden. Adults who did not have latrine were using the bush for their faecal disposal.

Table 13: Distribution of households by water supply and storage.

Water supply and storage in households	N=364	n	%	95% CI
Water supply and storage				
Households which reported inadequate water supply		91	24.9	20.1-30.2
Households not separating water containers for drinking and for domestic use		155	42.6	36.9-48.5
Households separating treated water from water for other use		59	16.2	12.1-20.9
Types of container for water storage				
Plastic		298	81.9	77.0-86.1
Clay pot		24	6.7	4.1-10.2
Metallic		4	1.0	0.2-2.9
Others		38	10.4	7.2-14.4

Table 14 shows the distribution of households by physical cleanliness selected characteristics. The major aspect of poor cleanliness observed for the majority of both the mothers/caretakers and children (slightly less than half of them) was clothes dirty. The other characteristics were more found in children than in mothers. About a third of children

had their noses unwept and their hair unkempt while slightly less than 20 percent had their faces unwashed and their hair dirty.

Table 14: Distribution of mothers and children by physical cleanliness.

Attributes of physical cleanliness	Mother N=364		Child N=364	
	Yes	No	Yes	No
Clothes dirty	155 (42.5)	209 (57.5)	169 (46.4)	195 (53.6)
Nose unwept/running nose	2 (0.6)	362 (99.4)	110 (30.2)	254 (69.8)
Face unwashed	9 (2.5)	355 (97.5)	70 (19.2)	294 (80.8)
Hair unkempt	64 (17.5)	300 (82.5)	96 (26.4)	268 (73.6)
Hair dirty	48 (13.3)	316 (86.7)	68 (18.7)	296 (81.3)

Figures in parenthesis are percent.

4. 1. 7 Health care practices

The distribution of households by use of family planning methods, antenatal care attendance and by growth monitoring attendance is presented in Table 15.

Family planning

About slightly more than half of the mothers reported that they were using family planning methods. A relatively high proportion did not use any method, while a few proportion practised family planning sometimes. Among their reasons for not practising family planning, more than two third of the mothers reported that they felt they needed not to plan because either they did not have enough children (45% of mothers) or they considered reproduction as a natural phenomenon (20% of mothers). The need to replace dead children was reported by 9.1% of mothers. Slightly close to a quarter of the mothers (13.6%) reported that they have never heard about family planning methods. The rest (9.1%) reported that their husbands do not allow them to use any method.

Close to twenty percent (18.2%) of children had a birth spacing of less than 2 years with an average of less than 1.4 children.

Antenatal care and growth monitoring

The attendance of an antenatal clinic was high. Almost all mothers (99%) started attending antenatal care when about 4.5 months (4.5 ± 1.3 with a median of 5 months) of pregnancy of the index child (Table 14). Almost all children (98%) had attended growth-monitoring session. A large number of children had the weight for age curve increasing while this was constant for 6.7% and decreasing for 10.5% of the children. About half of the mothers/caretaker reported that lack of time was the common reason for not attending growth-monitoring sessions, while the other half reported the loss of the card, mothers' sickness and child's sickness.

Table 15: Distribution of households by use of family planning methods, antenatal care attendance and by growth monitoring attendance.

Preventive health cares	N=364	n	%	95% CI
Use of family planning methods				
Yes, still uses		208	57.1	51.2%-61.9%
No, Never uses		151	41.4	36.7%-47.3%
Used for sometimes before		5	1.4	0.5% - 3.5%
Antenatal care attendance		295	99.0	97.1%-99.8%
Growth monitoring attendance		292	98.0	95.7%-99.3%

Home management of children sicknesses

The majority of the mothers do not use home management of child illness and go directly to health facilities in case the child had diarrhoea, cough and fever as reported by more than three quarters of the mothers (See **Appendix 4**). About a third of households (30.2%) give plenty of fluids during diarrhoea as the most common home treatment.

Very few mothers (reported by between 0.4 and 7.8% of households) give auto-prescribed medicine, herbs in all the cases of illness or sponge the child with water as fever arises.

Meanwhile children who reported incidence of diarrhoea during the previous two weeks prior the survey were given more fluids (61.5%) when they stayed at home than when they went to the hospital (25.7%). This difference in practice was statistically significant (Fisher exact p-value <0.05) as presented in Table 16.

Table 16: Home care management of diarrhoea (with regard to fluid intake) by place of treatment of the child

Place of treatment	Home care management strategy		Total	Fisher's Exact Test p-value
	Give fluids	Not give fluids		
At home	8 (61.5)	5 (38.5)	13 (11.4)	
Hospital	26 (25.7)	75 (74.3)	101 (88.6)	
Total	34 (30.2)	80 (69.8)	114 (100)	0.019

Figure in parentheses are percents

4. 1. 8 Social network and support

The main problems reported in households were: inadequate food (86.4%), poor living conditions and little income reported by nearly two third respectively (68.2 and 66.1%). About half of households (50.4%) cited poor crop yields while close to a half (46.2%) cited lack of land for farming as a problem. Also close to half of the households (47%) reported illnesses as a common problem. About a third (36.4 and 32.9% of households respectively) reported inadequate water supply because of lack of containers for storage and inadequate fuel supply. About 14.2% reported that they had problems of educating children because of lack of school uniform and a small proportion of households (8.4%) had dispute with neighbours.

Close to a quarter of mothers looked for advice from their neighbours, their husbands and family members as reported respectively by 21.5; 20.4 and 27.4% of households. Slightly more than ten percent (11.6%) consulted social and community health workers. Nine percent consulted their friends and 3.2% did not consult anybody when they had problems.

The decision on utilization of household resources was made in slightly more than a third of households (35.7 and 38.1% respectively) by the household head or both the couple. Close to a quarter (23 %) of mother had absolute decision-making power.

In case of taking the child to hospital, the decision was made by both the couple in slightly more than half of households (53.5%). In slightly more than a quarter of households the mother made decisions (28.2%) while the father made decisions in about 16.3% of households.

4. 1. 9 Morbidity and mortality

Slightly lower than two thirds of mothers (65.2%) reported that their children had been ill in the two weeks preceding the survey. The reported types of illness were diarrhoea, which was reported by close to a half of households (48.2%), fever and malaria by close to a quarter of households (24.6%), ARI (18.0%), measles (1.8%) and others (7.5%). Nearly all (84.9%) of sick children were treated at the health centres, 10% treated at home, a few (1.7%) were treated using traditional medicine or not treated (respectively 1.7% and 3.4%).

About 12.2% of the households reported the death of one or two children during their stay in the camp with a median of one child, making a total number of 43 children. More than three quarters (77.2%) of them, reported that they lost one child, close to a quarter (22.9%) two children. In our one-month observation, one child died in Karago camp due to diarrhoea.

The Under five Mortality Rate (U5MR) in the refugee camps was about 0.75/10000 children /day. Children were reported more likely to die at the age of 12 months. About two thirds of mothers (66.6%) lost their children due to malnutrition and diseases.

4. 1. 10 Attained growth and development of children

Selected variables of attained growth and development of children were weight, length (for children aged less 24 months old) or height (for children aged 24 months old), dentition, sitting without support, crawling and walking a few steps as presented in **Table 17**.

The average age of the index child was 14 months. At this age, the child had a median height and weight of 72.5 cm and 8.6 kg. The average number of teeth was 7 and its prediction equation in the rough estimation was " $y = -6.29 + 0.96 x$ ", i.e. given the actual age in months, "the number of teeth = (age x 0.96)-6.29".

The median time of the child achieved developmental skills was respectively five months, seven months and 12 months for sitting without support, crawling and walking a few steps.

The study sample had slightly less than two third of children (61%) who were walking, very few (5.8 %) who were just sitting without support and about a third (33.2%) who were crawling.

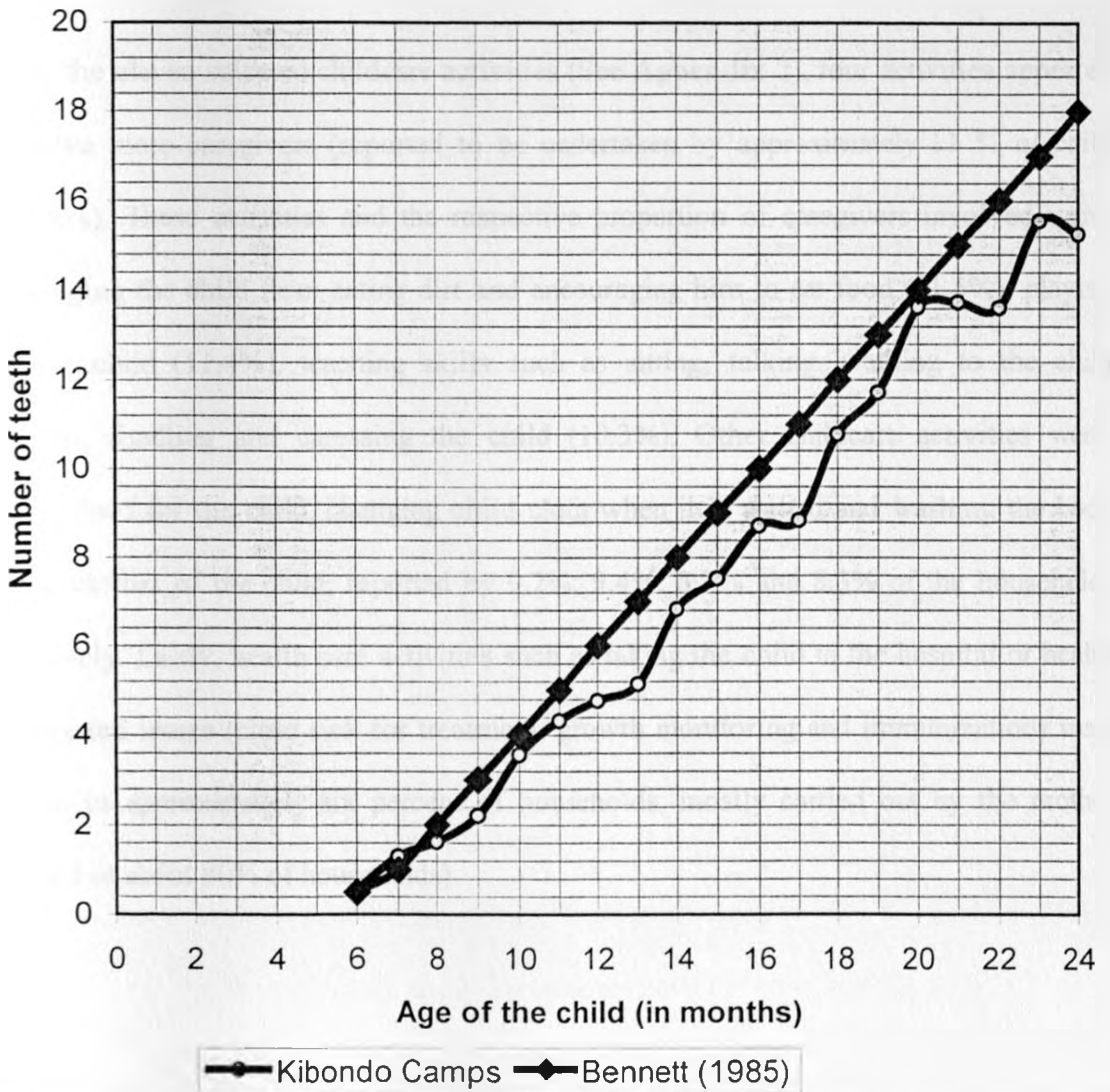
Table 17: Selected variables of attained child growth and development.

Growth and skills variables description	Mean ± SE	Median	Expected median ^a
	N=364		
Age of the index child (months)	14.45±5.04	14	14
Weight (kg)	8.7± 1.52	8.6	9
Length/height (cm)	72.45± 6.12	72.5	75
Number of teeth	7.22±5.03	7	8
Sitting without support (months)	5.18 ±1.01	5	6-8
Crawling (months)	7.06 ± 1.31	7	8-12
Walking a few steps (months)	11.67 ± 2.22	12	12-14
Proportion of households by children attained skill			
		n	%
Children sitting without support		21	5.8
Children crawling		121	33.2
Children walking a few steps		222	61.0

^a Expected average (Toole, 1993)

The slope of dental eruption among children aged six to twenty four months in the refugee camps is presented in Figure 5 that shows no big difference as compared to the rough estimation by Bennett (1985).

Figure 5: Slope of dental eruption of children in Kibondo refugee camps as function age (in months) compared to Bennett's study (1985).

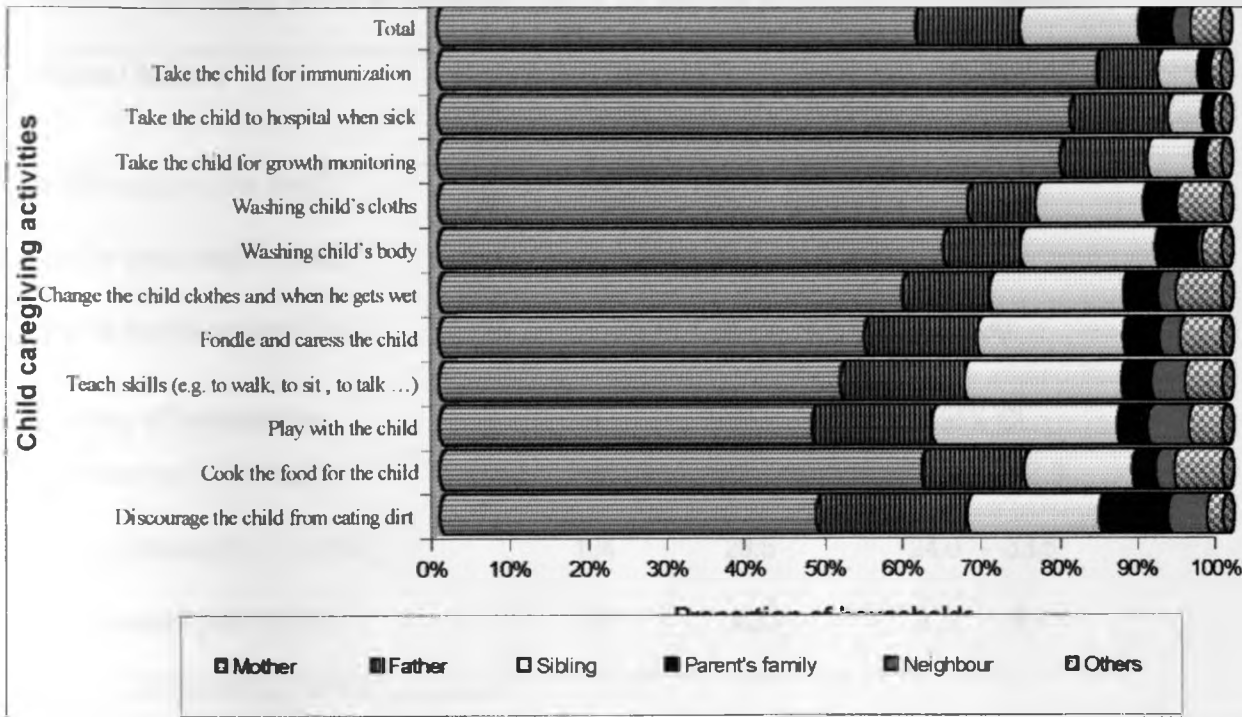


4. 1. 11 Care giving activities and caregivers involved.

The principal caregiver was the mother of the child as reported in close to two thirds (60.9%) of households, followed by the young sibling male or female (reported in 15.4%). The father of the child was mentioned in about 13.2%. Relatives and friends from mother or father's side were reported in approximately 4.1 % of households while 2.4 % of neighbours were also among child caregivers (**Figure 6**).

Among the eleven selected childcare activities (See **Appendix 2**), four activities appeared to involve more caregivers (reported to be undertaken by approximately 11 % of child caregivers). These activities and the respective proportion of caregivers involved were: discouraging the child from eating dirt and encouraging him to eat food (11.5%), playing with the child (11.4%), teaching skills such as sitting, talking, walking to the child (10.84%), fondling and caressing the child (10.3%). Other childcare activities were: cooking food for the child, changing child cloth when it is wetted and washing the body and the clothes of the child; reported by 9.2%; 9.4%; 8.7% and 8.3% of the households respectively. Lastly, health care activities such as taking the child to the hospital or health cares related issues (child sick for treatment, growth monitoring and immunization) were reported in approximately six percent of households, mostly carried out by the mother (reported in about 80% of households).

Figure 6: Child care giving activities and caregivers



4. 1. 12 Nutritional status of children in the camps

The population was moderately undernourished using NCHS / WHO 1977/85 standards, with a mean height for age z-score (HAZ) of -1.71. The mean weight for age z-score (WAZ) was -1.39 and weight for height z-score (WHZ) was -0.33.

Approximately six percent of the children were wasted (95% CI: 4.1-9.4) with 1.6% severely wasted. Almost twenty-nine percent were underweight (95% CI: 24.0-33.5) with 3.6% severely underweight and nearly forty-three percent were stunted (95% CI: 37.6-48.0) with 17% severely stunted (See Table 18).

Table 18: Nutritional status of children aged 6-24 months in the study population.

Nutritional indices ^a	Mean±SD		Median
	N=364		
Height for age z-score (HAZ)	-1.71± 1.32		-1.78
Weight for age z-score (WAZ)	-1.39± 1.02		-1.50
Weight for height z-score (WHZ)	-0.33± 1.18		-0.30
Proportion of malnutrition	n	%	95% CI
Children stunted (<-2 HAZ)	156	42.7	37.6 - 48.0
Children underweight (<-2 WAZ)	104	28.5	24.0 - 33.5
Children wasted (<-2 WHZ)	23	6.3	4.1 - 9.4

^a Based on NCHS/WHO 1977/85 standards

Prevalence of malnutrition in the different camps.

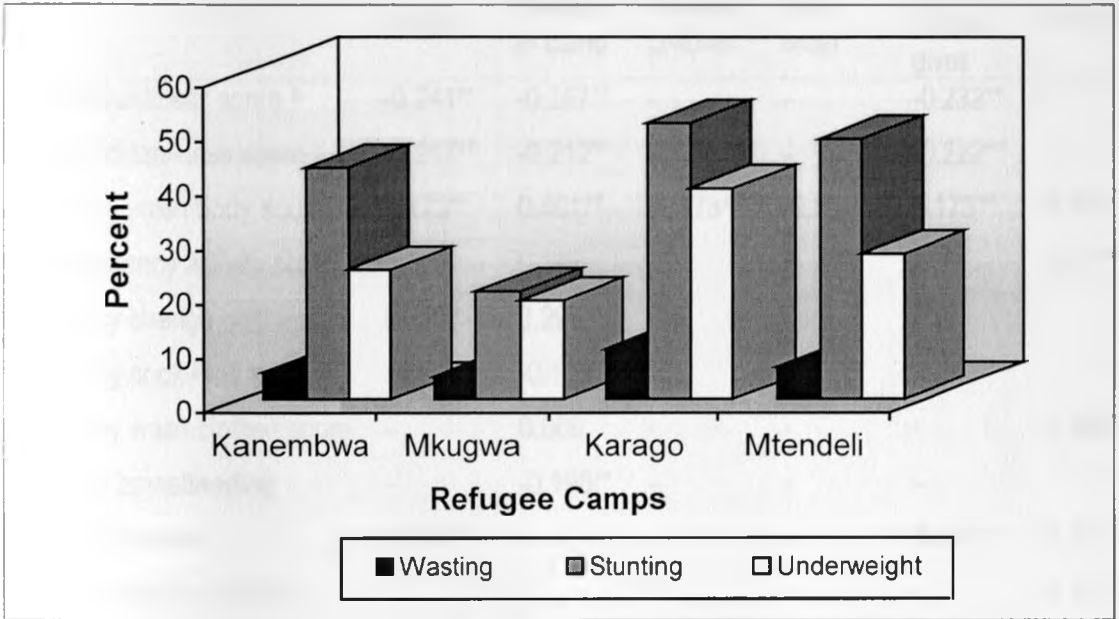
The distribution of children according to the prevalence of malnutrition in different camps is shown in **Figure 7**.

The prevalence of stunting in Karago camps (50.9%) was significantly higher ($p < 0.05$) than in the other camps; namely Mtendeli, Kanembwa and Mkugwa in which the prevalence was of 48; 42.7 and 20% respectively.

There was no significant difference in proportions of wasted and underweight children. The proportion of wasted children in Karago (9.3%) was high but not significantly different from other camps, which had 4.2; 5 and 6 % for Mtendeli, Kanembwa and Mkugwa. More than one third of the children (38.9%) were underweight in Karago camp. Meanwhile in other camps, slightly about or less than a quarter of children were

underweight i.e. 26.9% in Mtendeli, 24% in Kanembwa and 18.3% in Mkugwa camp and the differences were not significant.

Figure 7: Distribution of children by prevalence of malnutrition and by camp.



4. 2. Association between childcare practices, growth and development, morbidity and mortality in the refugee camps.

4. 2. 1 Association between childcare practices, household characteristics and anthropometric indices.

Household characteristics and childcare practices.

Household characteristics (six variables) were tested for correlation with some childcares practices components in order to establish whether they influence caring capacity in households. Other household characteristics that did not show any correlation with care variables are not given in this section. **Table 19** presents the correlation coefficients

components of childcare practices as dependent variables with household characteristics as independent variables.

Table 19: Correlation coefficients for the components of child care as dependent variables with household characteristics as independent variables.

	Wealth	Duration in camp	Number children	Birth order	Money Father gives	Water quantity
Child's cleanliness score ^b	-0.241**	-0.257**	-	-	-0.232**	-
Mother's cleanliness score ^b	-0.217**	-0.212**	-	-	-0.222**	-
Frequency wash body score	0.173**	0.401**	-0.173**	-0.164*	0.173**	0.175**
Total frequency activity score	0.065	0.147	-	-	-	0.273**
Frequency change clothes	0.127*	0.296**	-	-	-	-
Frequency cook food score	-	-0.117*	-	-	-	-
Frequency wash clothes score	-	0.009	-	-	-	0.166**
Exclusive breastfeeding	-	-0.198**	-	-	-	-
Number of meals	0.161**	-	-	-	0.162**	0.130*
Total food frequency score	-	-	-	-	-	0.179**
Time of complementary food	-0.117*	-0.154**	-	-	-	-
Age of starting ANC	0.310**	-	-	-	-0.152**	-
Time spent with child	-	-0.149*	-	-	-0.150**	-0.286**

^a: Based on Pearson coefficient of correlation.

^b: The lower the score the better the physical appearance; the negative relation, the positive the association. -: Not significant ** significant at 0.01 level * significant at 0.05 level.

The score of the physical appearance of the child and of the mother were significantly correlated (p-value < 0.01) with the wealth of the household, the duration in the camp and amount of money that the father provided per week. Children and mother were likely to have better physical cleanliness (personal hygiene) as the wealth of the household, the financial support received from the father of the child increased.

The age at which the mother started antenatal care attendance was negatively related to the amount of financial support from the father.

People who recently settled in the camps spent significantly more time with the child, more time of exclusive breastfeeding with late introduction of supplementary feeding and less frequency of cooking food (p-value <0.05).

The duration in the camp was not only significantly associated with the general physical appearance of the mother and the child but also with the frequency of washing body and clothes of the child.

Large families (with many children) were more likely to have low frequency of washing the body of the child (p-value < 0.05). Also households in which the mother was pregnant presented a poorer hygiene (cleanliness of the mother and the child) than (t-test=7.16, p-value < 0.01) households in which the mother was not pregnant.

The quantity of water fetched during the 48 hours prior to the survey had a significant positive correlation with the frequencies of washing the body and clothes, total frequency of activities, total frequency of food consumption and negatively associated with the time devoted by the mother to spend with the child.

Household characteristics and anthropometric indices

Anthropometric indices of height for age, height for weight and weight for age were tested to find out whether they varied according to different households and child characteristics.

Table 20 shows the major associations found between anthropometric indices and household and child variables.

Table 20: Differences in anthropometric indices associated with child, family and household characteristics.

Child and household factors	N	Test	HAZ	WAZ	WHZ
Gender of child					
Male	198		-1.7228	-1.7707	-0.3488
Female	166		-1.2401	-1.5767	-0.4955
		t	3.541**	1.529	1.008
Amount of money father provides	364	r	0.312**	0.155*	-0.013
Number of months of food shortage	364	r	-0.138*	-0.061	-0.062
Duration in the camp	364	r	0.202**	0.155*	-0.013
Age of child	364	r	-0.063	-0.081	-0.053
Age group of the child					
6-12 months	150		-1.365	-1.487	-0.297
13-18 months	129		-1.670	-1.937	-0.528
19-24 months	85		-1.491	-1.641	-0.455
	364	F	1.876	4.985**	1.022
One or more children had attended supplementary feeding programme					
No	296		-1.325	-1.558	-0.4335
Yes, Supplementary Feeding	31		-1.553	-2.101	-0.8706
Yes, Therapeutic Feeding	37		-2.192	-1.749	0.1549
		F	4.223**	2.599	1.955

* Significant at 0.05 level ** significant at 0.01 level;

t = Student's t-statistic;

r = Pearson's correlation

F = F-test

The Table 20 indicates that male were significantly shorter with a mean height for age z - score of -1.73 than female who had -1.24 (p-value < 0.001).

But they were neither significantly (p -value > 0.05) heavier (means -0.35 and -0.49) nor underweight (WAZ means -1.77 and -1.58).

No association was found between nutritional status and whether the mother of the child often received money from the father or not, but the amount of money that father provided per week and the duration in the camp was significantly correlated to the score of height for age of the child (p -value < 0.01) and the score of weight for age of the child (p -value < 0.05).

The age of the child did not have a linear correlation with the nutritional indices but the observed means were lower for the category aged 13-18 months with significant difference for length for age ($F=4.985$, p -value < 0.01).

In the households where one or more children had participated in a feeding programme (supplementary or therapeutic) in the camp, children were more likely to be stunted (p – value < 0.01).

Childcare practices and anthropometric indices

The association between childcare practices and anthropometric indices are presented in **Table 21**. Households with better cleanliness of the mother and the child reported a higher height for age z-score (p -value < 0.05). The quantity of water in the household was also positively correlated with weight for age and weight for height z- score (p -value < 0.05). Children whose mothers were pregnant had significant (p -value < 0.05) low height for age z-score (means -1.8 versus -1.4) and significant (p -value < 0.05) low weight for age z-score (means -1.9 and -1.6). Meanwhile no association was found for weight for height

(p-value > 0.05). The means weight for age and for height z – scores (WAZ and WHZ), were significantly associated with alternate caretaker, with children under the care of children under thirteen years old scoring lower for WAZ (p-value <0.01) and for WHZ (p-value <0.05). In all these cases, children whose alternate caretaker was an adult scored higher for all anthropometric indices, although not significantly for height for age z- score.

Table 21: Some childcare practices variables and anthropometric indices.

Care practices factors	N	Test	HAZ	WAZ	WHZ
Child cleanliness score	364	r	-0.114*	0.011	0.111
Water quantity	364	r	0.068	0.135*	0.116*
Mother cleanliness score	364	r	-0.124*	-0.012	0.089
Hours spent with child	364	r	0.0875	-0.096	-0.205*
Arrangement care					
At home	117		-1.349	-1.725	-0.621
Home and away	170		-1.558	-1.606	-0.286
With adult caretaker	25		-1.256	-1.094	-0.065
With young < 13	52		-1.677	-2.035	-0.653
	364	F	1.432	4.550**	3.381*
Mother Pregnant					
Yes	27		-1.815	-1.901	-0.414
No	337		-1.403	-1.611	-0.421
	364	t	6.654**	4.020*	0.002

* displayed are variables showing at least one significant association

Relationship between dentition, developmental milestones and childcare practices

The slope of dentition was computed to avoid the confounding effect of age of the child. Developmental milestones variables were considered in terms of achievement and categories were set based on the median time of achievement. Table 22 indicates some relationship between care variables and dentition eruption slope and skills.

Table 22: Relationship between dentition, skills and childcare variables

Care practices ^a	Dentition eruption	Time of achievement of skills		
		Sitting	Crawling	Walking
Exclusive Breastfeeding	-	0.284**	-	-
Complementary feeding	-	0.273**	-	-
Child cleanliness score	-	-	-	-0.126**
Mother cleanliness score	-	-	-	-0.191*
Number meals the child eats/ day	0.156**	-	-	-
Fulfilment of RDA for protein	0.354**	-	-	-
Fulfilment of RDA for Kcal	0.324*	-	-	-
Fresh green vegetable score	0.280**	-	-	-
Fruits frequency score	0.149*	-	-	-
Oil and plant fat score	0.133*	-	-	-

** significant at 0.01 * significant at 0.05 - not significant

^a: care variable is shown if it has at least one significant association with a dependent variable.

As shown in Table 22, there was a correlation between the duration of exclusive breastfeeding and time of initiation of complementary feeding with sitting skills of the child. No relationship between those variables and crawling skill were reported. Meanwhile, children whose intake of vitamin C was inadequate (less than RDA) were five

times more likely to achieve crawling late (more than the median age of six months). The physical cleanliness of the mother and of the child was correlated with walking skill. For given specific age, the number of teeth the child had, was positively correlated with the number of meals, the fulfilment of requirement of protein and energy intake and the food frequency of consumption of fresh green leafy vegetables, fruits and oil and plant fat. Boys were 2.3 times more likely to walk before twelve months of age than girls.

Malnutrition and childcare practices

The risk estimate of malnutrition tested with odds ratio (see Table 23), showed association with stunting (4 variables), wasting (1 variables) and underweight (1 variable).

Table 23: Risk estimate of malnutrition with care practices (Odds ratio)

Risk factors of malnutrition		Stunting	Wasting	Underweight
Sex	Boy/Girl	2.4 (1.49-3.92)**	ns	ns
Breastfeeding	On/off	ns	ns	2.1 (1.02-4.47)*
Exclusive breastfeeding	< 6 months	ns	2.5 (1.14-5.49)*	ns
Mother pregnant	(Yes/No)	1.6 (1.14-3.02)*	ns	ns
Good sewage disposal	(Yes / No)	4.3(2.2-8.50)**	ns	ns
Previous SFP ^b attendance	(Yes/ No)	3.6 (1.96-6.56)**	ns	ns

Figures in parenthesis are 95% confidence interval.

^b SFP: supplementary Feeding programme

* significant at 0.05 ** significant at 0.01 ns: not significant.

Table 23 shows that the gender of the child, the current breastfeeding status and exclusive breastfeeding duration, pregnancy status of the mother, sewage disposal and history of malnutrition in the household were risk factors for malnutrition among children in the camp.

Boys were more likely to be stunted (2.4 times) than girls. Children who were weaned were twice as likely to be underweight than those who were still breastfeeding. Also those who were exclusively breastfed for less than six months were two and half times more likely to be wasted than children who were exclusively breastfed for more than six months.

Children in households where the mother was pregnant were one and half times to be more stunted than children in households where the mother was not pregnant.

Furthermore, it was found that the risk for a child to be stunted was higher in families where the mother was pregnant (about one and half times more), where the sewage disposal was inadequate (four times more) and where one or more children have been enrolled in a supplementary feeding programme in the camp during the past months (3.4 times more).

4.2.2 Relationship between variables of morbidity, mortality, with household characteristics and childcare practices.

Association between household, family characteristics, care behaviours with morbidity

Sickness incidence and types of sicknesses as experienced in households were examined with households and childcare characteristics. Table 24 shows significant associations found between those characteristics and morbidity of children in Kibondo camps.

Table 24: Association between household and childcare characteristics with morbidity incidence of children.

<i>Household and care factors</i>	N	Cases	Incidence rate	Significance χ^2	Odds ratio
<i>Sickness incidence</i>					
Mother pregnant	364	237			
Yes	27	20	78.4		
No	337	217	60.9	0.004	2.33(1.29-4.27)
Growth monitoring trend	364				
Poor (flat or decreasing)	58	45	77.6		
Good (increasing)	290	182	63.0	0.047	2.04(1.01- 4.17)
Mother' s place of work	364				
Home	173	123	67.6		
Away from home	42	36	79.4		
Home and away from home	149	78	49.2	0.001	
Mother physical cleanliness			Mean score	Significance t-test	
Child sick	237		0.879		
Child not sick	127		0.536	0.002	

Figures in parentheses are 95% confidence intervals

Households in which the mother was pregnant, those which reported poor child growth curve trend from health cards and those in which the mother worked away from home, had significantly high incidence of diseases (p-value <0.05). The personal cleanliness of the mother was significantly poorer (p-value <0.01) for the sick child than it was for the healthy child.

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The relationship between household and childcare characteristics with type of illness of the index child is presented in Table 25.

Table 25: Relationship of household and childcare characteristics with type illnesses of children.

Households and childcare factors	% Diarrhoea n=114	%Malaria n=58	%ARI n=18	%Measles and others (n=47)
Duration in camp (months)	36.6	33.3	53.1	20.8
Significance F				0.03**
State of shelter				
Tent	22.5	27.5	2.5	47.5
Brick	37.7	11.7	22.1	28.6
Wood and mud	27.8	13.84	8.5	50.4
Significance χ^2				0.004**
Mother pregnant				
Yes	44.3	14.6	9.1	
No	25.7	15.6	12	
Significance χ^2	0.001**	ns	0.009**	

** Significant at 0.05 ns: Not significant χ^2 : chi square test F: F-test

The risk estimate for the child to get diarrhoea was higher (2.8 times) in the families where mother was pregnant. Malaria was more frequent in houses made of tents. Households, which presented cases of diarrhoea and acute respiratory infections, had a longer duration in the camps than those, which presented cases of malaria and measles.

Association between households, family and care practices characteristics with mortality.

In order to assess the extent to which different family and care variables are related to the mortality experienced by mothers in the camps, partial correlation coefficient was used to control for possible confounding variables namely the household wealth, education level and occupation of the mother. Table 26 indicates association between independent variables with death of under-five year old children experienced by the mother both in her time life and in her stay in the refugee camp.

Table 26: Correlation coefficients of mortality with households, family and childcare characteristics.

Household and care factors	Death in time life	Death in the camp
Duration in the camp	0.1652**	0.2016**
Number of children alive	0.6396*	0.0510 ns
Birth order	0.9345**	0.1895 ns
Age of mother at 1 st birth	-0.0748 ns	-0.1788**
Child spacing < 2 years	0.2002**	0.1879**
Actual age of mother	0.1902**	0.0216 ns
Breastfeeding duration	-0.2272 ns	-0.6159**
Time mother spent with baby	-0.1135 ns	-0.4349 *

ns, not significant

* significant at 0.05

** significant at 0.01

The number of children reported to have died was positively correlated with the number of children born in the household and with the number of cases of children whose birth spacing was less than two years (p-value<0.05). There was a significant negative correlation with the age at which the mother stops breastfeeding (weaning) and the time the mother spends with the baby (p-value <0.05).

Table 27: Summary of findings

FACTORS/ EXPOSURES	OUTCOMES	
1 Household and family characteristics	Childcare practices	
Household wealth	<ul style="list-style-type: none"> + Physical cleanliness, frequency of care activities (washing body and clothes, number of meals) - Time of initiating complementary food. 	
Duration in the camp	<ul style="list-style-type: none"> + Physical cleanliness, frequency of care activities (washing body and clothes, number of meals) - Exclusive breastfeeding duration and time the mother spends with the child. 	
Family size and birth order	- Frequency of washing the body of the child.	
Amount of financial support to the mother	<ul style="list-style-type: none"> + Physical cleanliness, number of meals per day - Time the mother spends with the child 	
Water quantity in the household	<ul style="list-style-type: none"> + Frequency of care activities (washing body and clothes), number of meals - Time the mother spends with the child 	
	Anthropometric indices	
History of malnutrition in the family	- Height for age status	
Financial support to the mother and duration in the camp	+ Height for age status, weight for age status	
Sex of the child (i.e. girls better than boys)	± Height for age status	
Age of the child	± Weight for age status (i.e. lower between 13-18 month old child)	
+ : Positive relationship	- : Negative relationship	± : associated according to the factor's category

FACTORS	OUTCOMES
<p>2 Childcare practices</p> <p>Hygiene: Physical cleanliness of mother and child Water quantity utilisation Inadequate sewage disposal</p> <p>General care: Maturity of alternate caretaker Time mother spends with the child</p> <p>Feeding: Exclusive breastfeeding duration Stopping breastfeeding</p> <p>Health seeking: Mother being pregnant</p> <p>Feeding: Frequency of giving food to the child % RDAs fulfilled for protein and energy Frequency of consumption of green fresh vegetables, fruits and oils. Exclusive breastfeeding duration Fulfilment vitamin C RDAs</p> <p>Hygiene: Physical cleanliness of the mother and child</p> <p>General care: mother working away from home Hygiene: Physical cleanliness Health seeking: Poor growth curve on health card Mother pregnant</p> <p>State of the shelter</p> <p>Age of the mother at the birth of the 1st child Time spent with the child</p>	<p>Growth and nutritional status</p> <ul style="list-style-type: none"> + Height for age + Weight for age - Height for age + All indices (height for age, weight for age and weight for height) + Weight for height + Weight for age ± Height for age ± Height for age <p>Dentition and milestones development</p> <ul style="list-style-type: none"> + Number of teeth for age + Number of teeth for age + Number of teeth for age + Sitting without support + Crawling + Walking a few steps <p>Morbidity</p> <ul style="list-style-type: none"> + Illness incidence - Illness incidence + Illness incidence + Illness incidence, diarrhoea episodes ± Illness type <p>Mortality</p> <ul style="list-style-type: none"> - Number deaths of children under 5 years old - Number deaths of children under 5 years old.
<p>+: Positive relationship -: Negative relationship ±: associated according to the factor's category</p>	

CHAPTER FIVE: DISCUSSION

The study aimed at assessing whether some components of childcare practices are associated with attained growth and development, morbidity and mortality of children in the refugee camps.

Childcare being a complex concept (Engle, 1982) and as previous research on this field and in this area were lacking, the present investigation made emphasis on the overall consideration of childcare components. Therefore the results generate data on childcare and provide an idea on which in-depth study can be projected.

5.1 Childcare practices

Different members of the community were involved in care of the young child. As commonly found in most part of Africa, extended family, including the in-laws, friends and neighbours participate in one way or another in different care activities. Neighbours participated more in emotional support (such as watching out the child from eating dirt, playing, teaching skills) than in physical care (e.g. feeding, washing the body, washing clothes, cooking food). It was not surprising to find that the mother of the child was the principal caregiver. The father and the young sibling of the child were important stakeholders in childcare and hence might be considered as target audience in programmes designed to improve child health in communities as referred to the framework by Murray et al. (1997). These findings on different people involved in care of the young child confirm others studies on how low-income working women find ways to meet childcare responsibilities (OEF, 1979, Cain, 1980, Nieves, 1981, Lommitz, 1978, Davenzo and Lee,

1983, Deere, 1983). Meanwhile there was no cases of child left alone as it was found in Bogota Colombia by Rivera (1979), mothers in the refugee camps opted taking their children at work with them in case there was no alternate caregivers.

5. 2 Factors affecting caring capacity

Household size and birth order

The negative predictive relationship between the number of household members and birth order with frequency of washing the body of the young child confirm other findings which established that the caring capacity is diminished in large families especially those with many preschool children (Jelliffe, 1986, Toole, 1985, Ebrahim, 1985). The first-born children seemed to benefit much attention from their mothers in terms of hygiene care behaviours than the last-born children in the households. This may be explained also by the weakening of the mother especially if the interval between births of children is short (Norderberg, 1978, King and Martodipoero, 1978, Bennett, 1985).

Household wealth, duration in the camps and financial support to the mother

The household wealth, the duration in the camp and the financial support to the mother of the child were associated with childcare practices. The level of physical cleanliness was very low for children especially cleanliness of clothes and the body. Some children were reported having only one dressing item. Whenever this was washed, the child had to wait naked for it to dry. In other households, difficulties in getting soap limited the frequency of its use for washing the child. There was no application of lotion or vaseline or oil on the child.

The observed positive predictive relationship between household wealth with physical hygiene behaviours and the number of meals the child had per day, which was significant even controlling for age of the child, could be understood since resources could be mobilised easily if available at the household level to allow the caretaker to use them. But while examining the financial support to the mother, no significant difference was found between those who received assistance and those who did not. The matter was the amount of support that showed a significant prediction in enabling mother/caretaker to improve the caring capacity. Similarly, the positive influence of the duration in the camp on hygiene behaviours suggests that it may be due to the probable psychological, emotional stability or environmental adaptation that people gain as they stay in the camp (WHO, 1997, ACC/SN, 1999).

Meanwhile the negative predictive relationship that household wealth had on initiation of other food to the baby has been documented even in free-living population (Lawrence, 1969, Mitzner, 1984). But the negative correlation duration in the camp with exclusive breastfeeding duration could not be expected and explains how complicated breastfeeding behaviour change can be.

Although the prevalence of breastfeeding in the refugee camps was considered still high compared to the Tanzanian statistics, the host country it declined as compared to the Burundian statistics, the mother country (UNICEF, 1998). The decline in terms of initiation and duration of breastfeeding has a historical understanding. For instance, in Jamaica this trend has been observed despite deteriorating socio-economic conditions of the population (Melville, 1994). The World Fertility during the 1970s surveys and the earlier 20th century related the causes of changes to the demands of modern life and

industrialisation (ACC/SCN, 1999). In the refugee camps, the coping strategy in case of food shortage for poor mothers was either working for food or for cash. That might be the reason explaining the impact of wealth status in feeding behaviours. It confirms studies carried out in Gambia, Nigeria, Bangladesh, Korea and Tanzania that suggested that reduced suckling and weaning time was observed in wet season because of labour demand (Carloni, 1984).

Similarly, the negative relationship between the duration in the camp with the time allocation of the mother to the child may be explained by the principles of social ways of meeting childcare by delegating responsibilities by the low-income mother (Myers and Indriso, 1995). Since the time spent in the camp widen the informal social network made of non-kin and kin, the mother use it as alternate caretaker as well in the reciprocal exchanges such as information, job assistance, loans (food, clothing and tools), services (farming, cooking, fetching water) and moral support. This confirms the other findings on the role of social network in care behaviours (Lommitz, 1978, Bond, Valente and Kendall, 1999). However, no clear explanation could be drawn from the negative correlation between the amounts of financial support to the mother with her time she allocated to the child during the day.

Household water supply

The adequacy of water supply in the household as reported by mothers did not show any significant difference in care behaviours. However the quantity of water in use in the household was positively predicting the frequency of washing activities (body and clothes) and the number of meals even controlling for the age of the child. Such finding explains direct relationship of water use with its practical needs in the household. The negative

predictive association of water quantity with time the mother spends with the child may be due to the fact that poor living conditions and lack of containers for water storage were households reported problems in daily life. Therefore the mother or caretaker has to fetch water for many times to get the desired quantity; as a consequence the time allocated to the child is reduced. This confirms findings according to which the work-time of the low-income mother, spent for collecting firewood, fetching water, farming or in casual labour has a trade-off with the time allocation for the child care (Evans, 1995)

5. 3 Household factors affecting nutritional status

The prevalence of malnutrition was found to be relatively high as compared to the results of the previous surveys (UMATia and IRC 2000). But this prevalence was for children under five years old children. The prevalence of stunting (42%) was almost the same as compared to the findings in other camps in Ngara, Tanzania in 1997 (ACC/SCN, 2000) where it was reported to be 44% in children aged 6-59 months. This situation of increasing levels of malnutrition must be regarded with much attention since it has been linked in emergencies, with mortality rate to the extent of doubling as wasting arises from 5-10% and quadrupling with the rises of 10-20% (ACCN, 1999). Karago camp had the highest prevalence of malnutrition suggests that was due to the fact that it was the newest camp with poor living conditions, instability and no access to land. At the time of the survey, it was still receiving new arrival refugees in emergency situation. Mkugwa camp had the lowest level of malnutrition. That may be explained by the fact that it had the lowest population, most educated and in a multicultural environment (i.e. Hutu and Tutsi ethnic groups and Congolese).

The positive relationship between amount of financial support and duration in the camp in the camp with anthropometric indices (weight and height) may explain why households with socio-economic instability (i.e. with history of malnutrition in the past) had lower height status. This confirms that socio-economic characteristics of the household are determinant factors of nutritional status as found in other studies in India (Dervi and Geervani, 1994), in Nicaragua (Lamontagne, Engle and Zeitlin, 1997), in Kenya (Kogi-Makau, 1992, Newmann and Harrison, 1994) and in Uganda (Owor et al., 2000).

The association of gender of child with the height status showing girls taller than boys contradict findings in Nicaragua studies in which boys had higher height for age than girls (Lamontagne, Engle and Zeitlin, 1997). The age category of 13-18 months had lower weight for age as compared to children aged less than 13 months and more than 18 months. Similar finding was observed in Thailand and Nicaragua (Oxford Medical Publications, 1985, Lamontagne, Engle and Zeitlin, 1997).

The overall pattern of dental eruption was not bad. The prediction equation of actual number of teeth considering the actual age of the child was almost the same as found by Bennets (1985). The time of skills achievement, which was respectively 5, 7 and 12 months for sitting without support, crawling and walking a few steps was lower than that found in other studies (Bennetts, 1985; Balldin, 1991; Toole, 1993). Generally the child seems achieving development milestones earlier than in those studies.

5. 4 Childcare practices, child nutritional status, growth and development

General care practices

The study found that the risk of malnutrition was higher when the child had an under thirteen-year-old child as alternate caretaker. This significant association between the maturity of the alternate caretaker with nutritional indices (weight and height) confirms many other findings according to which, children cared for by younger people are at higher risk of malnutrition than their peers cared for by older persons (Evans, 1995, Lamontagne, Engle and Zeitlin, 1997). That can be due to the fact that, the younger the child caretaker, the more poorly their charge can be performed (Shah, Walimbe and Dhole, 1979).

The positive correlation of the time allocation of the mother to the child during the day with child weight for height status confirms the principles according to which mother workload and physical care had an effect on child nutritional status (Engle, 1992, Evans, 1995). Although delegating responsibilities for childcare is one of the good ways of coping strategies by the mother when working, the need for management and supervision is always necessary. However, the work effects have been found varying. In Indonesia, Soekirmar (1995) found that the negative effect of mother employment on child nutritional status is only significant if the mother works more than forty hours a week with minimum wage. But according to Engle, Pederson and Smedt (1986), this is limited to domestic workers with poorly paid labour.

Hygiene care practices

The elements of hygiene namely physical cleanliness, sewage disposal and water supply in the household were associated with child nutritional indices. This is in confirmation with different studies showing that poor hygiene practices had an impact on long-term child nutritional status. Unlike in Nicaragua where the effects were manifested at a short term (Lamontagne, Engle and Zeitlin, 1997), these findings confirm the results of the Mozambique Demographic Health survey (DHS, 1999). The positive correlation of the quantity of water with weight for age can be explained since water use in terms of amount reflect also the amount of hygienic childcare practices.

Breastfeeding practices

The results of the study reveal that breastfeeding initiation is a common practice in the population. However variation in its duration showed significant association with nutritional indices. The effects at a short-term on the child (on weight status) were mainly found with short exclusive breastfeeding duration while at a long term (on height status) with short duration of the breastfeeding process. Since the study sample comprised children aged 6-24 months, those who stopped breastfeeding had high prevalence of malnutrition than those who were still breastfeeding. This agrees with others studies that showed that initiation of breastfeeding is not a problem in Africa but the concerns are the early termination of breastfeeding and low quality of complementary food (Tessema and Hailu, 1997. Agnarsson et al., 2001).

The positive correlation of exclusive breastfeeding duration with time of achieving the skill of sitting without support could not find clear explanation but suggests that it may be

due to the fact that improper early introduction of other foods to the baby (which reduce the exclusive breastfeeding duration) may lead to infections and diarrhoeal diseases, consequently impairing both the caretaker process of teaching the skills to the child and the ability of the sick child to practise (ACC/ SCN, 1999, Bennett, 1985, Andrew and Watson, 1993, Hendricks and Badruddin, 1992).

Complementary feeding

The introduction of other foods to the child was progressive and the most common food given was porridge of Corn –Soyaa Blend (CSB) because it was given as food ration. That was good habit given that CSB was the main source of protein, vitamin A, thiamine and iron. Although the score for oil was high during food frequency of consumption, many households did not add it during preparation of special food for the baby. One of the problems was that oil distributed to increase the calorie intake of the ration was the first item subject to selling in the camp. This was reported especially in households where coping strategy was reduction of number or frequency of meals and borrowing to pay debts. Selling or bartering food ration is not an isolated practice to Kibondo camps. It has been observed in many refugee camps in which people live totally dependent on food aid (ACC, 1999; ANP, 1995). Consequently, energy intake was not enough to fulfil child requirement and almost three quarters of children did not meet even 50% of their recommended daily allowance. A part from CSB, other food given to the baby was bulky most consisting of roots and tuber, cereals and legumes. Less food varieties was commonly observed even after controlling for the age of the child. Furthermore protein intake was not enough and was of poor quality. This was due to the fact that the diet itself was of vegetarian type for most of refugees. Complementary feeding process was principally based on the ration received hence CSB. Even though, the content of CSB (USAID/WFP),

unlike other complementary food (e.g. Nutrisano of Mexico) is lower in calcium, zinc and vitamin B12 compared to WHO recommendations (Lutter, 2000). Less than sixty percent of children fulfilled their daily-recommended allowances of those nutrients except calcium. A part from sharing the common pot with adult when they had grown up, children rarely had special rich diet cooked for them.

Significant association of frequencies of giving food, fulfilment of recommended intakes of protein, energy with dentition eruption and milestones development was found. The positive relationship between feeding practices in terms of frequency and quantity of food given to the child and number of teeth given the actual age was not surprising. But unexpectedly, only vitamin C fulfilment of requirement was associated with time of achievement of crawling i.e. those who did not meet requirement were two times more likely to achieve crawling skills beyond 7 months, the median. These can be explained by the fact that diversity and good quality of food are very important for the young child since growth depend on availability of macro and micronutrients for the construction of body tissues (Balldin et al., 1991; Bennetts, 1985; Cameron and Hofvander, 1985).

Although other findings suggest that growth failure for the period of 6-24 months might not be due to inadequate intake (ACC/SCN, 2000), in Kibondo refugee camps factors could be considered as multiple.

5.5 Factors affecting child morbidity and mortality

High incidence of illness was found. Most of the children (about half) suffered from diarrhoeal diseases, malaria and fever like diseases (about a quarter), acute respiratory infections and others diseases. Possible explanations are that the research was carried out during the rainy season (between November to February corresponding to the period of heavy rains) in the area. The incidence of diarrhoea was higher than other illnesses. From documented literature, this can be associated with milestone development of sitting, crawling when the contact of children with the soil starts and with improper introduction to complementary food (Jelliffe, 1985; Bennett, 1985 and ACC/SCN, 2000).

The observed high incidence of illness for children whose mother was pregnant, with poor hygiene practices or working away from home and those whose growth-monitoring trend was poor was expected since all those factors have been documented to result in poor caring capacity. This confirms other findings in India where parental care had strong influence on the control of infectious diseases mainly diarrhoea episodes (Devi, Py and Geervani, 1994).

It was found also a positive relationship between the number of birth spacing of less than two years and child death both in time life and in the camp. The time of stopping breastfeeding, the number of hours mother spent with the baby and the age of the mother at first birth were negatively correlated with the mortality rate in the camp but were not in time life.

6.1 Conclusion

The study aimed at seeking whether different components of childcare practices were associated with child nutritional status, attained growth and development, morbidity and mortality among children in the refugee camps. Different conclusions can be drawn from the findings.

1. Some components of childcare practices do not influence nutritional status, attained growth and development, disease incidence and mortality incidence of children aged less than five years. Those components are breastfeeding initiation and patterns; water supply, storage container types and treatment methods; storage of leftovers, washing hands, garbage disposal, antenatal care attendance, growth monitoring attendance, immunisation status and home management of child illnesses.
2. The following childcare components affect physical growth and developmental milestones among refugee children in Kigoma-Tanzania:
 - Poor hygiene of the mother or the caretaker, poor birth spacing of less than two years of age have a negative impact on height status of children living in the refugee camps.
 - Low maturity (less than 13 years) of the alternate caretaker and exclusive breastfeeding duration of less than six months affect negatively weight status of children.

- Poor feeding practices namely low frequency of food consumption, especially for green fresh vegetable, fruits and oil; low number of meals served per day, failure to fulfil recommended daily allowances for protein and energy, contribute to slowing down of eruption of child's teeth.
 - Adequate vitamin C intake contributes to earlier achievement of crawling skills by the child.
3. The following childcare practices are associated with malnutrition rate, morbidity and mortality incidence of children in the refugee camps:
- Earlier termination of breastfeeding contributes to high incidence of underweight among children in the camps.
 - Exclusive breastfeeding of less than six months contributes to acute malnutrition (wasting)
 - Poor sewerage disposal and poor family planning resulting in close pregnancies (of less than two years interval) contribute to chronic malnutrition (stunting).
 - Poor physical cleanliness of the caretaker or the child, the status of pregnancy of the mother of the young child and working away from home for the mother influence the incidence of disease in the camps.
 - Maternal age has an influence on the mortality rate of children aged below five years.
 - The time mothers spend with their children is a factor that influences the mortality rate among refugee children aged below five years.

6.2 Recommendations

The study found that environmental problems to childcare are contrasted at the community level where health care services are provided and food ration distributed by international agencies; and at household where poor living conditions, socio-economy, culture and self-reliance are common problems. The recommendations consist in managing more effectively the existing services to maximize good outcomes on one hand and in designing new interventions that tend to improve the conditions of women and children in the camps on the other hand.

a) Maximizing utilisation of existing services

Nutrition and health situation of refugees must be considered according to the reality of their home country. Any behaviour change had to be based on that. Appreciation of improvement of quality of services might be compared with past home statistics and socio-economic, demographic, nutrition and health indicators. Therefore, some recommendations are suggested:

1. In MCH, emphasis must be made toward application of knowledge of home management of child illnesses. Since hospital can be over crowded especially in new camps, to get emergency services is not easy and might result in risking the child to die before or just after medical intervention.
2. To challenge negative individual or cultural behaviours towards family planning in reproductive health so that the incidence of getting pregnant before the child reaches two years old decreases.
3. To encourage the population to maintain habit of exclusive breastfeeding up to six months and continuation after the child reaches twenty months of age. This is feasible

since it can be incorporated as teaching topic during MCH education session with aid of IEC materials for illustration.

4. Emphasize on general hygiene, the physical and the environmental even if living conditions in the camp are very hard.
5. More counselling for unstable household presenting cases of past malnutrition and situation analysis to detect possible risk factors to it, than simply rehabilitating the child that does not end malnutrition but shifts it from acute to chronic.
6. Negotiate with the host government toward cultivation land allocation for refugees as that can improve not only the economy of refugees themselves but it can be a potential main-power for enhancing agricultural productivity in the region. Interaction of refugee population and local population always exists.
7. Encourage negotiations between belligerent parties to end conflicts and war in the Great Lakes regions.

b) **More intervention programmes for maternal and child well-fare**

In order to improve the conditions of women and children, new intervention programs are needed. This might consist in increasing the opportunity to the woman to earn or generate income that can help her to break limitations to care giving for the children.

Concrete recommendations to this point are:

1. Inviting donors or other Non Governmental Organizations who can provide non-food items for children in the camps (clothes, shoes, soap etc.)
2. Creating a child well-fare programme to provide optimum conditions of growth and childcare for this vulnerable group.
3. Inviting organisations that can work with women toward improvement of their living conditions and empowerment of their caring capacity.

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APPENDICES

Appendix 1. Questionnaire for Kibondo survey

SECTION 1: GENERAL SURVEY DATA

- 1 Household number identification NO){ Inomero y'inzu} ____ - ____ - ____? ____
- 2 Camp name: {Izina ry 'ikambi 1] Kanembwa 2] Karago 4] Mtendeli 5] Nduta} ____
- 3 Name of survey Team {Izina ry'uwubaza} 1] A 2] B 4] D ____
Name of the interview
- 4 Date of survey {Italiki yo kubarizwako} (day, month, year e.g. 1-1-1998) ____
- 5 Respondent name {Izina ry'uwubazwa}__ Sex {Igitsina} 1] Male 2] Female. ____
- 6 Relation to household head {Ico bapfana w'uwuryango}..... ____
1] Husband 2] parent 3] relative 7] Other (specify) ____ 8] Don't know
- 7 What is your country of origin? { Wavuye mugihugu ikihe?}..... ____
1] Rwanda 2] Burundi 3] DRC 7] other (specify)____ 9] No answer
- 8 Since how long have you settled the camp? {Uri ngaha mwikambi kuva ryari?}
(e.g. 1 for one year, 1-4 for 1 year 4 months.....) ____

SECTION 2: SOCIO-DEMOGRAPHIC CHARACTERISTICS

Fill in provided space or circle if applicable

9 Record the following information for all the household members (see codes below)

Sno	Relation to index child	Name	Sex {Igitsina}	Age Inyaka	Religion -code- Idini	Education -code- Amashure	Occupation -code- Icoakora	Brings money Kimuzarura 1]yes 2]NO	Civil Status

Education

- 1] completed primary school
- 2] not completed primary school
- 3] completed secondary school
- 4] Not completed secondary school
- 5] not attended school
- 6] attending secondary school
- 7] informal education (specify _____)
- 8] Can read only
- 9] Can read and write

Religion

- 1] Christian
 - 2] Islam
 - 3] others
- Relation to the index child*
- 1] HHH other than parent.
 - 2] Mother
 - 3] caregiver
 - 4] father
 - 5] other

Occupation

- 99] preschool children
- 1] House-wife
- 2] casual labourer
- 3] salaried employed
- 4] business
- 5] Artisan
- 6] student

SECTION 3: SOCIO-ECONOMIC CHARACTERISTICS

10. What are your main sources of income other than the ration distributed in the camp?
 { Nihibe bintu bibinjiriza ubutunzi kireste ibiribwa muronka?} _____
 0] Nothing 1] employed 2]business 3]casual labour 7]others (specify) _____
11. Do you receive gifts { Muraronka infanyozivuye ngaha mubanyanzihugubo mw'ikambi?} _____
12. If yes, from who and how much? {Nimba arivyo, ziba zivuye kwande kandi ziba zingana gute _____
13. Record items found in household. { N'' akuhe karanga kinzu babamwo?}

Item	Codes 1] Yes 2] No
40. Radio	
41. Bicycle	
42. Cassette radio	
43. Hanging line	
44. Dish rack	
45. Refuse pit	
46. Latrine	

14. What is the quality of the housing? {n'akuhe karanga kinzu babamwo?} _____
 1] Tent intact 2] Tent with mud 7] other (specify) _____

SECTION 4: FOOD CONSUMPTION

15. What are the common sources of the food other than WFP? _____
 Mukura ikibiribwa hehe kiretse birya muhabwa na WFP (PAM)
 1] NGOs donations 2] purchase 3] farming 7] others (specify)
16. How long does the food ration distributed last _____
 {Ibirimwa mufata vyoba bimara iminsi ingahe?}

7. If the food finishes before the next distribution, what is done in the household to cope with the shortage? {Lyo bishitse ibiribwa bigahera yuko mutega ibindi muvjifatamwo gute kugirango muhebo?} 1] Work for food 2] work for cash 3] borrowing 4] purchase 5] reduction of the number of meals 6] reduction of the quantity of the food eaten _____ 7] others (specify) 9] No answers
8. Did you experience food shortage during the last months? 1] yes 2] No
 {India zoba zaraheze imbere yuko musubira gutega mu kwenzi guheze?}
9. If yes which month? {Nimba arivyo, ni mukuhe kwezi}(give No e.g. 12 for December). _____
20. What form of energy was used for cooking yesterday?
 (N'ubuho buryo bwogutekesha mwakoresheje wakoresheje n'ijiro.....
 1] Charcoal bought 2] Wood, bought 3] Wood free collection
 4] Charcoal free collection 5] Petroleum 6] charcoal and wood collected 7] Other
 (specify)_____

21 Please let me know all food consumed in the 24 hours in the household, their amounts, ingredients and their amounts served to the child and the leftovers. 24-Hour recall { Nagomba kumenya indya zose mwafunguye mumasaha 24, ngaha munzu, ingene zingana-ibizigize-ivyo mwagaburiye umwana nivyo mwasigaje.

Time Umwanya	Dish Izina y'indwazariwe	Total Vol.Of Dish Ingene isahani ingana	Name of Ingredients Ibwokobw'ibir Bwaingene Ingana	Amount of ingredients in the family meal	Amount Served Tochild	Amount Of food Leftover	Amount Food Consumed
Bk/fast Mugatondo							
Snack Kamusase							
Lunch Sasita							
Snack Kamusase							
Supper Mwijoro							

22 Please let me know how often the child eats the food listed below {Woshobora kumbwira incuru umwana yoba arya ibiribwa twadondaguye aho muni}. Food frequency

Codes 0] Never 1] Monthly once 2] Weekly, once 3] Daily once
4] Daily more than once 5] occasionally 7] other (specify)

Food {Ibiribwa}	Frequency of consumption {Incuribiribwa}	Observation {Icotubivugako}
Meat (large livestock, e.g. cow, pig, sheep) {Inyamaz'ibikokobininibinini}		
Meat (small livestock, e.g. poultry, rabbit) {Inyama z'ibikoko bitayi}		
Fish, seafood {Amafi}		
Egg, egg products {Amagi}		
Milk, milk products {Amata}		
Oils {Amavuta}		
Plant fats {Ibinure vyo mubitegwa}		
Animal fats {Ibinure vyo mubikoko}		
Sugars {Isukari}		
Fresh green leafy vegetables		
Other fresh vegetables		
Fruits		

SECTION 5: MATERNAL CHARACTERISTICS

23. What is the amount of financial support that the father of the child provides? {Niyihe ntererano y'umushingantahe kuvyerekeranye n'anmahera mu muryange} 1]nothing 2]partial 3]everything 4]father absent/no father 7]other (specify)
How much per week does the father provides? {Umushingantahe yoba yinjinza, atanga, kimahera anganiki mundwi?}..... _____
- 24 Occupation of the mother { Ibikorwa vy'umuvyeyi (umunarugo)} _____
1] Salaried/employment 2] Casual job 3] domestic services 4] Nothing 7] others
- 25 Location where the mother works {Aho umunarugo akora} _____
1] Home 2] away from home 3] home and away from home 7] Other (specify)
- 26 How many hours does the mother work per day? {umunarugo akora amasaha angahe ku muni}. 1] One to three hours 2] four to eight hours 3] more than eight hour _____
- 27 How many hours does the mother spend with the child? { Umuvyeyi yoba amarana amasaha angahee n'umwanawiwe _____

- 28 What arrangement does the mother take for the care of the young child when she works? {Umuvyeyi yitwararika gute gufasha umwana mu gihe arikukazi?} _____
 1] at home with working mother 2] bring with mother to work elsewhere
 3] leave with adult caregiver 4] leave with child caregiver under thirteen years
- 29 What was your age when you gave birth to your first child?
 {Wibarutse umwana wambere ufuseimyaka ingahe?} _____
30. How many children alive did you give birth? {Mubana wavyaye abariho ni bangaha?} _____
- 31 How many children did you give birth who are deceased?
 {Mubana wavyaye abapfuye ni bangaha?} _____
- 32 How many cases exist with birth spacing < 2 years
 {N'izihe mvyaro zskurikiranye mu kirongo kirimunsi y'imyaka 2?} _____
- 33 Are you (the mother) pregnant? {Woba wibungenze. Ku ugore} _____
 0] No 1] Yes, 0-2 months 2] Yes, 3-5 months 4] Yes 7 months 5] Yes, 8 months
 6] Yes, 9 months 8] Don't know 9] No answer
34. please let me know relatives you have in the camp and how support (moral and financial) is shared between you. {Nagomba menye incuti ufese ngaha mw'inkambi n'ingene mufashanya).

Relative {incuti}	How you help him, her {Ingene vyifasha}	How he/she help you {Ingene igufasha}

Codes: Relatives: 1] nuclear family 2] extended family 3] family in law
 Support: 0] nothing 1] advice 2] visit 3] food 4] money 5] farming
 6] Fetching water 7] other (specify) __ 10] Full assistance

SECTION 6: CHILDCARE PRACTICES

Feeding Practices

- 35 How many hours after birth did you start breastfeeding? {Watanguye konsa haheze amasaha angaha uvyaye? 1]Immediately 2]1-4 hours 3] 5-12 hours 7] other.
 _____
- 36 Did your child receive any other fluids in addition to breast milk during the first days after birth? {Hari ikindi kinyobwa (binyoba)woba warahaye umwana muminsi yambere inyuma yo kwibaruka _____
 1] Yes 2] No 8] Don't know 9] No answer

- 37 If yes, what fluids did you give to the child immediately after delivery before the first breastfeeding? {Nimba arivyo nikihe kinyobwa wahaye umwana akivuka imbere y'uko atangura konka} 1] warm water 2] porridge 3] sugary water 4]none 7]other _____
- 38 Are you still breastfeeding? {Aracabandanya wonsa} 1]yes 2]No _____
- 39 If no, when did you stop breastfeeding? {Nimba utonsa, wahagaritse ryari?} _____
- 40 How long have you exclusively breastfed your child? {Wonkoje umwana iminsi ingahe atakindi umugaburira?} _____
- 41 At what age did you introduce other foods to the baby? {Watanguye kugaburira umwana ibindi bintu afese amezi angahe?} _____
- 42 Why did you introduce those foods at that time? {Kubera iki watanguhe kumugaburira murico iringo?} 1] the baby was crying when people eat 2] mother did not have enough milk 3] mother sick 4] mother at work 5] habit 6] proper time for introducing food 7] others (specify) _____
- 43 Do you find that the child is eating enough food ? _____ {Woba ubona yuko umwana aryaneza} 1]Yes 2]No 8] Don't know 9]No answer
- 44 If no, Why? {Nimba atarivyo vyoba biva kuki?} _____ 1] Child is capricious 2] child often sick 3] child don't enjoy meal 7] Other
- 45 How many meals do the child receive per day? {Umwana yoba afungura kangahe ku munsu} _____
- 46 Do you give the leftovers to the child? {Woba ugaburira indwazaraye umwana?} 1] Yes 2] No 3] Sometimes _____
- 47 Has one or more children enrolled in a feeding programme during your stay in the camp? {Murizondwi, hoba hariho umwana yari muri fidingi kungaburo} 1] Yes in SFP 2] Yes in TFP 3] no 4] No answer _____

Water, sanitation and hygiene

- 48 Do you have enough water for daily needs in the household? _____ {Moba muronki amazi akwiye mukeneye gukoreshe ku munsu?} 1] Yes 2] No 7] Don't know
- 49 How much water did you fetch in the last 48 hours ? _____ {Muraya masaha 48 arangiyew mwoba mwanvomye amazi angana gute?}
- 50 Where do you store your drinking water? {Amazi mukoresha muyabika muki?} 1] Plastic 2] clay pot 3] metallic 7] others (specify) _____

51 If you store water in separate containers, please let me know why. {Nimba muyabiha muyabika mukindi kintu, ndasavye ndabimenye igituna? _____
 1] Separate drinking boiled water 2] separate not treated drinking water
 3] no separate containers 7] others (specify) _____

52 How do you store the leftovers?..... _____
 1] Warm and cover 2] refrigeration 7] others (specify) _____

53 Observe the physical appearance of the child and the caretaker and tick.
 {Ihweze ingene umwana n'uwumureze ku mubiri ba meze ushireho ikimenyetso}

Observation {Ivyo ubana}	Child {Umwana}	Caretaker {Uwumureze}
Clothes dirty {Umpunzu zicafuye}		
Nose unwept/running {arekereza imiseru}		
Face unwashed {Ntiyoze mu maso}		
Hair unkempt {imeshatsi fuye}		
Hair dirty {imeshatsi icafuye}		
Others specify {Ibindi bivuye}		

56 How was washing of baby's clothes contaminated with faeces disposed of yesterday? {Inyuma yo kumesa impuza umwana yitumyemwo musesa he? _____
 1] Garden 2] Field/woods 3] Latrine 4] River 5] refuse pit 7] Other

57 How was garbage/household waste disposed of yesterday? {Imyanda yanijoro musanze bayishinguye gute? (Atari amazi) _____
 1] Public garbage collection 2] Disposed of openly (street,..)
 3] Burned 4] Buried 7] Other 9] No answer

Psycho-social characteristics

Answer to the following questions on any problem on (codes: 1] Yes 2] No)

58 No or little land {Ntasi na ntoya cante isi ntoya yo kurima?} _____

59 Low yield from the land {Umwimbu mukeyi uvuye mu burinyi?} _____

60 Little income _____

61 Poor living conditions {Ubuzima / imibereho mibi} _____

62 Disputes with neighbours {Gutata n'ababnyi} _____

- 63 Educational problems for the children {Ingorane zo gusomesha abana}..... _____
- 64 Frequently ill {Kwama agwaragurika} _____
- 65 Little food {Ibifungugwa bikeyi} _____
- 66 Poor or inadequate water supply {Amazi adakwiye canke mabi} _____
- 67 Inadequate energy supply (wood, charcoal etc.) {Kutaronka umucanwa ukwiye} _____
- 68 Other problems {Izindi ngorane} _____
- 69 No problem { Nta ngorane} _____

70 Who do you consult for advice in case of problems? {Ninde witurako gusaba impanuro iyo ugize ingorane? _____
 1]mother 2]father 3]sister 4]brother 5] cousins 6]Aunts 7]maid
 8]grand parent 9]neighbour 10]friend 77]others (specify) _____

71 Who make decision of utilization of household resources? {N'inde afata ingingo y'ikoresha ry'ivyo umuryango utunze? _____
 1] Household head 2] mother 3] father 4] both the couple
 5] Both house hold members 7] other (specify) _____

Who make decision to go to the health facility? {ninde afata ingingo yo kuja kwa munganga?} _____
 1] Household head 2] mother 3] father 4] both the couple 7] Other (specify)

Health care practices

72 Do you attend any program of family planning? {Woba ukurikiza umugambi wo wo gutandukanya imvvaro? 1]Yes 2] No 3] Sometimes _____

If No, why? {Nimba atarivyo.ni kuberiki} _____
 1] Natural gift of God 2] No enough children 3] Replace dead children
 4] No knowledge of methods 5] happens naturally after 2 years
 6] No husband 7]husband refusal 77] others

73 Did you attend antenatal care before giving birth to this index child? {Woba warapimishije imbanyi imbere y'uko wibaruka uyo mwana 1] Yes 2] No _____

74 At what age of gestation did you start antenatal care? {Woba watanguye kwipimisha inda imaze amezi angahe} _____

- 75 Are you attending growth-monitoring (show card){Woba ujana umwana kurupimo(erekana ikarata} 1]Yes 2]No 7]others (specify) _____
- 76 If no, why? {Nimba atarivyo,ni kuberiki}..... _____
1] child sick 2] mother/caregiver sick 3] no time 4] child >9months 7] Others
- 77 If yes, how was the weight during the last session? {Nimba arivyo, yapimye ibiro bingane kurupimo ruheruka?} 1] Normal 2] Decreasing 3] Constant _____
- 78 Is the child immunized (show card)? {Yoba umwana yaracandazwe {erakana ikarata) 1] Yes 2] No 3] interrupted 4] child less tha 9 months _____ ... _____

Home management of child illness

- 79 Please let me know what is first done in household when the child sick of:
{Nagomba menye ivyo mukora ngaha muhira iyo umwana arwaye}
- Diarrhoea? {gucimbwamwo} _____
- Cough {Inkorora} _____
- Fever {Umururumbo}..... _____
- Codes: 1] prepare oral salt solution 2] give fluids 3] prepare an ORS
4] do nothing and go to hospital 7] others (specify) ____ 9] nothing

SECTION 7: CAREGIVERS' IDENTIFICATION

82 Please let me know how often these activities are performed and who do them.

{Nagomba menyene incuro moba mukora ibintu bikurikira n'uwubikira}

Codes of caregivers: 1] mother 2] father 3] sister 4] brother 5] cousins 6] Aunt 7] Maid 8] grand mother 88] Don't know 77] others (specify) 9] Anyone in the household 10] neighbour

Codes of How often: 1] once a day (every day) 2] twice a day 3] three time a day 4] once two days 5] once a week 6] twice a week 7] three times a week 77] others (specify)

Childcare activities {Ibikorwa vyo kwitaho umwana}	How Often {Incuro}	Caregivers {uwubikora}		
		1st	2nd	After
Discourage the child from eating dirt or encourage him to eat food Kubuza umwana kurya imyanda canke, kumuhimiriza kurya indya	xxxxx			
Cook the food for the child {Guteka ibiribwa vy'umwana}				
Play with the child {Gukina n'umwana}	xxxxx			
Teach skills to the child (to walk, to sit, to talk etc. {Gucisha ubwenge umwana (gutambuka, kwichara n'ibindi}	xxxxx			
Fondle and caress the child {Guhendahenda umwana}	xxxxx			
Change the child clothes and when he gets wet {Guhindura impunzu z'umwana iyo ya zisovyemo}				
Washing child's body {Kozza umwana}				
Washing child's clothes {Kumesha impunzu}				
Take the child to growth monitoring {Kujana umwana kugipimo}				
Take the child to hospital when sick {Kuja na umwana kwa muganga iyo arueye}				
Take the child to immunization and other measures {Kujana umwana ku gicandago na kubindi bipimo}				

SECTION 8: MORTALITY AND MORBIDITY

81 For the last 14 days, has the child had any illness? {Muriyo muni 14 heze umwana yoba yaragwaye indwara? 1] Yes 2] No _____

82 If Yes which one? {Nimba arivyo, yandwaye indwara iyahe?} _____
 1] Malaria 2] cough 3] diarrhoea 4] Fever 5] measles
 7] other(specify) _____ 8] Don't know

- 83 Where was the child treated? {Umwana yavurewe hehe ?..... _____
 1] Home 2] Health centre 3] traditional 7] others (specify) _____
- 84 Since you are in the camp, how many children under five years old have died?
 {Kuva uje mwikambi, umaze kubura abana bangahe bari muni y'imyaka 5}

Child name {Izina ry'umwana}	Age at death {Imyaka yapfuye afise}	Cause(s) of death. {Icatumye apfa}	
		Perceived Ivyo wibaza	Health report Ivyavuye kwa muganga

Cause(s) Codes: 1] diseases 2] environment and climate 3] sanitation
 4] Not enough food 7] other (specify) _____ 8] don't

know

SECTION 9: GROWTH AND DEVELOPMENTAL MILESTONES

- 85 Let me know when the child achieved these steps of growth and development.
 {Nagomba kumenya aho umwana yatanguye kugira intambuko zikurikira mu
 bwenge no mugukura}

Dentition {Kumenya amenyo}		Milestones development {Kumenya ubwenge}	
Teeth	Number	Skills	Age at achievements
Upper jaw		Sitting without support	
Lower Jaw		Crawling	
Total		Able to walk a few steps	

SECTION 10: OTHER CHILD'S CHARACTERISTICS

- 86 Anthropometric measurements of the Child: weight, Length/height
 Household No _____ Date of birth (DOB): ____/____/____
 Date of weighing ____ / ____ / 2000

Sno	Cno	Child name	Sex	Age in Months	Weight		Height	
					1st	2nd	1st	2nd

Appendix 2: Caregivers and child care giving activities

Care giving activity	Mother		Father		Sibling		Parent's family		Neighbour		Others		<i>Total</i>	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Discourage the child from eating dirt or														
encourage him to eat food	356	47.8	145	19.5	124	16.6	66	8.86	38	5.1	16	2.2	745	11.52
Cook the food for the child	364	61.38	77	12.99	83	14	17	2.87	14	2.36	38	6.41	593	9.17
Play with the child	348	47.3	113	15.4	175	23.7	28	3.80	39	5.3	33	5.8	736	11.38
Teach skills e.g. to walk, to sit, to talk	357	50.9	112	16	141	20.1	26	3.71	30	4.3	35	4.9	701	10.84
Fondle and caress the child	361	54.1	97	14.5	124	18.6	30	4.50	18	2.7	37	5.4	667	10.32
Change the child clothes and when he gets wet	358	29.1	68	11.2	103	17	26	4.29	14	2.3	37	6.1	606	9.37
Washing child's body	361	64.2	55	9.8	98	15.7	29	5.16	4	0.7	15	6	562	8.69
Washing child's cloths	363	67.5	45	8.4	76	14.1	21	3.90	1	2	32	5.9	538	8.32
Take the child to growth monitoring	355	79.1	51	11.4	27	6	7	1.56	0	0	9	2	449	6.94
Take the child to hospital when sick	357	80.4	56	12.6	20	4.6	6	1.35	0	0	5	1.13	444	6.87
Take the child to immunization	356	83.8	34	8	22	4.9	7	1.65	0	0	6	1.41	425	6.57
<i>Total</i>	3936	60.87%	853	13.19%	993	15.36%	263	4.07%	158	2.44%	263	4%	6466	100%

Appendix 3: Morbidity and mortality experienced in the camps

	Camp				Total
	Kanembwa	Mkugwa	Mtendeli	Karago	
Morbidity	n (%)	n (%)	n (%)	n (%)	n (%)
Incidence of illness	71 (74.7)	36 (60.0)	54 (55.1)	73 (68.9)	234 (65.2)
Chi-square (χ^2)					9.553 *
Illness type					
Diarrhoea	34 (49.3)	15 (41.7)	39 (55.7)	22 (41.5)	110 (48.2)
Fever and malaria	11 (15.9)	10 (27.8)	17 (32.1)	18 (25.7)	56 (24.6)
ARI	21 (30.4)	5 (13.9)	10 (18.9)	5 (7.1)	41 (18)
Others	3 (4.3)	6 (16.7)	4 (7.5)	8 (11.5)	21 (9.3)
Chi-square (χ^2)					23.27*
Place of treatment	n	%	95% CI		
Home	18	10.1	6.2-15.7%		
Health centre	152	84.9	80.4-91.1%		
Traditional	3	1.7	0.4%-4.9%		
Not treated	6	3.4	2.7%-5.3%		
Mortality	n	%	Mean±SD		
Number U5 in the camp	298	100			
Number children alive	298	100	2.63±1.67		
General U5 death	71	23.8	0.38 ± 0.80		
U5 death in the camp	35	12.2	0.16±0.50		

Appendix 4: Home care management practices of child illnesses

Home care and illness	Diarrhoea	Cough	Fever
Giving plenty fluids	110 (30.2)	0	0
Giving medicine	3 (0.7)	20 (5.4)	7 (2.0)
Giving herbal	1 (0.4)	5 (1.4)	1 (0.3)
Sponging with water	0	0	13 (3.5)
Cover the child against cold	0	45 (12.5)	28 (7.8)
Nothing	250 (68.8)	294 (80.7)	255 (86.4)
Total	364	364	364

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