

**UTILIZATION OF NATIONAL GUIDELINES FOR FOOD,
NUTRITIONAL SUPPORT AND CARE FOR PEOPLE
WITH HIV/AIDS IN RWANDA IN THE CAPACITY
PROJECT SUPPORTED HEALTH CENTRES**

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FOR THE DEGREE OF MASTER OF SCIENCE IN
APPLIED HUMAN NUTRITION.**

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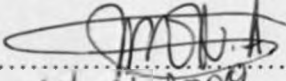
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DECLARATION

I, NYIRAHABINEZA ALPHONSINE, hereby declare that this is my original work and has not been presented for a degree in any other university.

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Date 11.02.2009

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DEDICATION

This work is dedicated to the Lord Almighty, whose intervention and control has been of great importance during all my studies, to my dear husband for his unceasing care and support as well as to my dear children Gracieuse, Promise and Providence, with whom we have been struggling together throughout!

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ABSTRACT

Rwanda has engaged in the fight against HIV/AIDS by addressing malnutrition among people with HIV/AIDS through adoption of the guidelines for food and nutritional support and care of people with HIV/AIDS since 2005. The objective and purpose of this study were therefore: a) to evaluate the utilization of the national guidelines for food and nutritional support and care for people with HIV/AIDS in Rwanda in the Capacity project supported health centres and b) determine their food and nutrition situations. This was investigated under six specific objectives, two research questions and three hypotheses as reflected in the results. The specific objectives were to establish the extent to which the national guidelines for food and nutritional support and care for people with HIV/AIDS are being utilized, challenges encountered by health providers and clients in the service delivery, perceptions of the clients to the services given, their socio-demographic characteristics, nutritional status, dietary diversity and other food related factors. The sample consisting of twelve (12) service providers and one ninety two (192) (one sixty five females (165) and twenty seven (27) males) people with HIV/AIDS was drawn from those participating in food and nutrition programmes in Capacity project supported health centres. Selection of Capacity project supported health centres and providers were purposive while selection of people with HIV/AIDS at the health centres consisted of all the clients who were present at the time of interview. Data were collected using structured questionnaires and anthropometric measurements. Data management, entry, cleaning and analysis were done using the statistical Package for Social Sciences software (version 12.0.1) and analysis of results done by simple descriptive statistics, bivariate analysis (chi-square), correlation and tests of equality of means.

The results showed that the national guidelines were used to an extent of 27.9%; which led to the rejection of the hypothesis that "the utilization of guidelines for food and nutritional support and care of people with HIV/AIDS in Capacity project health centres is adequate". It has also answered the research question that was addressing how the guidelines were being utilized. The clients' satisfaction to the service offered in food and nutrition programme was rated as 61.1% while the main challenge of both providers and their clients (90.1%) is lack of food expressed either as insufficient food aid (62%) and/or

lack of income generating activities (28.1%). This also answered the second research question that was determining the challenges faced by both clients and providers in the programmes. The age of the respondents ranged between 19 and 74 years with a mean of 35.4 and a median of 35. Their main occupation was farming (93.2%) with a level of education not exceeding primary education (94.3 %). It was found that the nutritional status showed that 8.4% were underweight, 83.1% had a healthy weight, and 8.5% overweight; hence a total of 16.9% that were not of a good nutritional status. The mean individual dietary diversity score of the respondents was three (3) food groups per individual. Further analysis showed that gender was the only socio-demographic characteristic that was statistically different between both the individual dietary diversity and nutritional status ($p < 0.05$): this led to the decision to partially reject the second hypothesis that “there is a positive relationship between the socio-demographic characteristics and both the individual dietary diversity and the nutritional status of the respondents”. The third hypothesis that “there is a positive relationship between the respondents’ dietary diversity and nutritional status” was also rejected as the findings showed a negative correlation even if it was not significant ($r = -0.075$ and $p = 0.325$).

The data led to the conclusion that: in Capacity project supported health centres, national guidelines for food, nutritional support and care of people with HIV/AIDS were inadequately utilized, people with HIV/AIDS are moderately satisfied with the service given, they are food insecure and nutritionally at risk of both under and over nutrition and they have a low mean individual dietary diversity.

It is recommended that the Capacity project ensures that food and nutrition activities are fully and adequately included in the management package for the control of HIV/AIDS disease by offering services recommended in the guidelines, initiating productive income generating activities, offering food aid to those people who are food insecure (based on fixed entry and exit criteria to avoid dependency) and emphasizing on nutrition education of the targeted People with HIV/AIDS. The last recommendation but not least is that the Ministry of Rwanda conducts a national evaluation on utilization of the national guidelines for food and nutrition for People with HIV/AIDS.

ABBREVIATIONS

ACC/SCN	Administrative Committee on Coordination Sub-Committee on Nutrition
AED	Academy for Educational Development
AFASS	Acceptable. Feasible. Affordable. Sustainable and Safe
AIDS	Acquired Immune Deficiency Syndrome
ART	Anti Retro Viral Therapy
ARV	Anti Retro Viral
BMI	Body Mass Index
CD4	Cluster Designation4
Cm	Centimetres
FANTA	Food and Nutrition Technical Assistance
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
HDDS	Household Dietary Diversity Scores
HIV	Human Immunodeficiency Virus
IDDS	Individual Dietary Diversity Score
IGA	Income Generating Activities
ISAE	Institut de Sciences Agronomiques et Elevage
ISAR	Institut de Sciences Agronomiques du Rwanda
Kg	Kilogram (s)
MAP	World Bank Multi-Country HIV/AIDS Program
MINAGRI	Ministry of Agriculture and Animal Ressources
MOH	Ministry of Health
MUAC	Mid Upper Arm Circumference
NGO	Non Governmental Organization
NUR	National University of Rwanda
PMTCT	Protection of Mother to Child Transmission
PS	Purposive Sampling
PWHA	People with HIV/AIDS
RDHS	Rwandan Demographic Health Survey
RTUF	Ready-to-Use Therapeutic Food

SARA	Support for Analysis and Research in Africa
SPSS	Statistical Package for Social Sciences
TB	Tuberculosis
USA	United States of America
USAID	United States Agency for International Development
VCT	Voluntary Counselling and Testing
WHO	World Health Organization

OPERATIONAL DEFINITIONS OF TERMS

- Adult PWHA:** All PWHA involved in the program aged over 18 years
- AIDS:** Acquired Immunodeficiency Syndrome: a group of diseases caused by HIV.
- Anorexia:** Loss of appetite for food.
- Beneficiaries:** PWHA involved in the Food and Nutrition programs
- Cachexia:** A profound state of ill-health, malnutrition and wasting
- Caregiver(s):** The person who cares for a PWHA: he may be a member of the family or, if the person lives alone, he may be a neighbour, a relative or a friend.
- CD4 cells:** A type of T cell involved in protecting against viral, fungal, and protozoal infections. These cells normally orchestrate the immune response, signaling other cells in the immune system to perform their special functions.
- Client:** PWHA involved in the Food and Nutrition Program of the Health Centre (those who are shown by the host Health Centre).
- Counselling:** Dialogue between a client and a care provider aimed at enabling the client to cope with stress and take personal decisions relating to their condition, i.e., HIV/AIDS. The counselling process includes the evaluation of personal risk of HIV transmission and the facilitation of preventive behaviour
- Dietary Diversity:** The number of foods or food groups (in this study) consumed in the reference period.
- Extent of Guidelines utilization/ utilization of guidelines:** level or degree of utilization of the guidelines:
- i. 0-49%: inadequate utilization
 - ii. 50-74%: moderate utilization
 - iii. 75-100%: adequate utilization
- Food and Nutrition assistance:** Any assistance given to PWHA; either food aid or income generating initiative

Food Diversity	Term used to mean variety in the foods taken by an individual.
Food insecure individuals:	Those individuals PWHA who are not able to get enough food or no food at all in a given period of time.
Food insecurity:	Situation of those individuals PWHA who are not able to get enough food or who do not have it at all in a given period of time
Food security:	A situation whereby every person, at all times, have physical, social and economical access to sufficient, safe and nutritious food to meet their nutrient needs for an active and healthy life.
Guidelines for Food, Nutritional Support and Care for People with HIV/AIDS:	Document containing instructions about food and nutrition of People Living with AIDS (It is only one document including all the guidelines on food and nutrition of people with HIV/AIDS). Protocol can also be used as it is a summary booklet of the guidelines document.
Head of household:	Person who is in charge of the household: a person who is answerable to all the household needs.
Health/Service Provider:	The person who is in charge of food and Nutrition programs of the health centres or even the health centre itself.
Household:	All the people who live together in one house as a family.
Income Generating Activities:	Activities that allow for diversification of sources of income in small-scale, self-employment business schemes e.g. supporting population in management, supervision and implementation of their businesses.
Malnutrition:	Failure of body functions which occurs when intake of nutrients falls below certain minimum requirement.
Nutrition:	The science of food and how it is utilized by the body for growth, work, play, sustain health and resist diseases.

Perceptions of clients/ Satisfaction of the clients to the services: level or degree of satisfactions defined by guidelines related indicators and are as follows:

- i. 0-49%: low satisfaction
- ii. 50-74%: moderate satisfaction
- iii. 75-100%: high satisfaction

PWHA: A general term for people infected with HIV, whether or not they are showing any symptoms of infection.

Rural: Relating to the countryside; not the city

Wasting: Refers to low body weight relative to height. Usually results from acute shortage of food and/or severe disease.

X²: Chi square value (s)

CHAPTER ONE

General Introduction

1.1 Background information

***General Overview of Rwanda**

Rwanda is a largely mountainous and landlocked country of 26 338 km² in the Great Lakes region of central Africa. According to the provisional estimates of the Census of 2002, Rwanda population is estimated at 8,162,715 inhabitants. Rwanda, with her 310 inhabitants per square kilometre, is among the countries of Africa with the highest population density. The climate is temperate tropical type with an average temperature of 19°C and an annual rainfall ranging between 900 and 1,600mm. The Country experiences a short rainy season from September to November and a long rainy season from February to May. The short dry season runs from December to January and the long dry season from June to mid-September. Agriculture is the main national source of foreign currency and survival for the population (Rwanda MINAGRI, 2004). The country consists of four provinces: North, South, East and West, in addition to the City of Kigali.

***HIV/AIDS in Rwanda**

Current health indicators reveal the precarious situation exhibited by the majority of Rwandan households which restrict the ability of the population to participate fully in the economic development of the country (Rwanda MOH, 2005a). The situation is worsened by other macro economic factors related to poverty in general as characterized by the low Gross Domestic Product (GDP) resulting into low capacity to manage the diseases; and in particular transmissible diseases, malnutrition and AIDS. The devastating effects of those conditions have kept on increasing instead of decreasing.

The HIV/AIDS prevalence in Rwanda is 3% with a 7.3% and 2.2% in urban and rural areas respectively (RDHS, 2005). A part from malaria, AIDS places the greatest burden on the health system and economy of the country. It is estimated at 13.2% in Kigali town, 6.3% in other urban areas and 3.1% in rural zones (Rwanda MOH, 2005a).

Malnutrition is another burden on the population of Rwanda with 9% of women aged between 15 and 49 years with a BMI<18.5, anaemia affecting 32.8% of women of reproductive age (RDHS, 2005) and 7% of pregnant women suffering from night blindness. The Rwandan population is also affected by over nutrition: according to the Rwanda Demographic and Health Survey 2000, 12.5% of women between 15 and 49 years old were overweight (BMI > 25), with higher rates in urban areas (24.5%) compared to rural areas (9.9%)(Rwanda MOH, 2007). Being overweight or obese is a risk factor for diseases such as diabetes, gout, cardiovascular diseases, etc (Rwanda MOH, 2007).

Like HIV/AIDS, malnutrition compromises the immune function and thus increases susceptibility to severe illness and risk of death. Since HIV/AIDS weakens infected individuals resulting in reduction of productivity, agricultural production and household income which in turn result in household food insecurity. It limits the capacity of affected households to acquire adequate food for quality care, and to adopt appropriate health and nutritional responses to the disease. As infection rates rise, the effects of the pandemic have negative impact on food security, nutrition and household coping strategies. Good nutrition is essential for increasing the efficacy of medications, such as antiretroviral drugs, and plays a critical role in the strategies for the prevention, treatment and care of HIV/AIDS.

To address problems and mitigate the effects of HIV/AIDS, effective strategies that include: providing care and treatment (ARV drugs), education, nutritional care and support for PWHA (people with HIV/AIDS) need to be put in place. Rwanda has adopted policies and guidelines related to HIV/AIDS prevention and treatment including guidelines addressing issues of nutritional care and support for people with HIV/AIDS as part of management of the disease.

1.2 Statement of the Research Problem

Given the magnitude of HIV/AIDS in Rwanda, its high prevalence: 3% of the population: 7.3% in the urban areas and 2.2% in the rural areas. (RDHS, 2005) and negative impact on the population health, food and nutrition status, different intervention strategies and supportive guidelines have been put in place. They include guidelines for food and nutritional support and care for PWHA. The guidelines were adopted in 2005 and disseminated in 2006. Providers of food and nutrition services have been trained on the utilization/application of guidelines in order to implement them successfully.

Despite all these efforts, nutrition care and support in the fight against HIV/AIDS in Rwanda have been limited in coverage, scope and not harmonized for a long time and also a missing dimension in the package of treatment and care for PWHA (Rwanda MOH, 2006). There is concern that these guidelines are not being adequately applied especially due to a low budget allocation to nutrition, insufficient human and material resources allocated to nutrition. In 2000, the Government budget allocation to nutrition was very low at 2% of the Health budget which, in turn, represented only 0.5% of GDP (Rwanda MOH, 2006). These can negatively affect the application or utilization of the guidelines; which in turn will affect the health, food and nutritional status of the PWHA; this last statement leading to justify the need of investigating the food and nutrition situations of the targeted population by determining their nutritional status and individual dietary diversity.

1.3 Justification of the Study

Malnutrition and HIV compromise the immune function, by increasing susceptibility to severe illnesses, (opportunistic infections) and reducing survival. This necessitates taking action in the fight and treatment of AIDS; by providing food, nutritional care and support of PWHA. In response to this, the Government of Rwanda has made substantial progress in the fight against AIDS by mobilizing its own resources and those from partners (The Global Fund, World Bank, MAP, USA government and others) in providing the necessary support and care. This has led to the adoption of guidelines for food and

nutritional support and care for PWHA to ensure better quality support services in food and nutritional care to PWHA.

These Guidelines, which were adopted in 2005 and disseminated in 2006, address different nutritional needs for different population groups of people infected and affected by HIV/AIDS. Such groups include adults, adolescents, pregnant and lactating women, children, and antiretroviral therapy (ART) clients within households and health facilities. From 2006, health providers are supposed to adopt and apply them in the food and nutrition services offered to PWHA in their facilities. For this reason, evaluation/monitoring of their utilization is highly desirable in order to generate information on the extent of their utilization and the level to which their objectives are being achieved in improving food and nutrition status of PWHA. In addition to that, nutrition services have been for long missing or not integrated in HIV/AIDS. This therefore justifies the need of evaluation of the utilization of the established protocols and guidelines on nutritional care and support of PWHA as well determination of the food and nutrition situations (nutritional status and individual dietary diversity) of the PWHA that are being given such services.

1.4 Aim of the Study

The aim of this study is to contribute towards the improvement of the interventional strategies put in place for purposes of mitigation of HIV/AIDS infections rates and prevalence.

1.5 Purpose of the Study

The purpose of the study is to establish the level or extent of utilization of national guidelines for nutritional support and care for PWHA in the Capacity project supported Health Centres and determine the food and nutrition situations of people with HIV/AIDS.

The findings from the study shall be used to give recommendations to decision makers and health service providers, in order to improve their efficiency in service delivery of nutritional care and support given to PWHA in Rwanda.

1.6 Objectives

1.6.1 General Objective

The general objective of this study is "to evaluate the utilization of the national guidelines for food and nutritional support and care for PWHA in Rwanda and to determine the food and nutrition situations of people with HIV/AIDS who are involved in the food and nutrition programmes at the Capacity project supported health centres"

Specific Objectives

Paper 1: Chapter 3

1. To determine the extent of utilization of national guidelines for food and nutritional support and care of PWHA by health service providers in the Capacity project supported health centres;
2. To determine the level of satisfaction (perceptions) of clients/PWHA on the food and nutrition services being given to them;
3. To determine challenges encountered by service providers and their clients at health facility based nutrition programmes as well as suggestions given to solve them.

Paper 2: Chapter 4

4. To determine the socio demographic characteristics of PWHA involved in the food and nutrition programmes at the Health centres;
5. To determine the nutrition status of PWHA supported by the food and nutrition programmes of the health centres;
6. To determine the individual dietary diversity and other food related factors among PWHA supported by the food and nutrition programmes of the health centres.

1.7 Research Questions

The study addressed the following questions:

1. How are the national guidelines for food and nutritional support and care for PWHA being utilized in Capacity project supported health centres?
2. What are the challenges encountered by service providers and their clients (PWHA) in utilization of the national guidelines for food and nutritional support and care for PWHA?

1.8 Hypotheses

Paper 1: Chapter 3

1. The utilization of national guidelines for food and nutritional support and care for PWHA in the Capacity Project supported health centres is adequate.

Paper 2: Chapter 4

2. There is an association between socio-demographic characteristics and both the individual dietary diversity and nutritional status of the PWHA enrolled in food and nutrition programmes of the Capacity project supported health centres.
3. There is a positive relationship between the nutritional status of PWHA and their individual dietary diversity score.

1.9 Benefits of the Study

1. This particular study was supposed to provide information on the extent to which the objectives of guidelines for food and nutritional support and care of PWHA are being met and thus help decision makers and health providers to carry out necessary adjustments in quality services delivery towards achievement of the objectives.
2. The new knowledge/ information provided by the study findings shall contribute to improvement of service delivery by health service providers, extension

workers. those involved in testing. counselling. diagnosis. treatment. home-based care as well as health planners. those offering social. educational and nutritional services. international and national agency staff and research and training institutions interested in the community and national programs for PWHA.

3. PWHA will also benefit from the findings by receiving improved service, their households and caregivers; thus improvement in their food and nutritional status. In addition to that. they will be able to solve their food and nutrition related problems.

CHAPTER TWO

Literature Review

2.1 What Is HIV/AIDS?

AIDS (Acquired Immune Deficiency Syndrome) is a disease of the immune system caused by a retrovirus known as the Human Immunodeficiency Virus (HIV). It makes individuals highly vulnerable, giving opportunity to viruses, bacteria, fungi and other parasites to further weaken the body and cause many illnesses and conditions such as pneumonia, tuberculosis (TB), oral herpes sores and muscle wasting. Such infections and conditions found in HIV infected individuals are called opportunistic since under normal circumstances they would not be cause for alarm but arise due to weakened immunity as a result of HIV and become life-threatening (FANTA, 2004). A person is said to have developed AIDS when he/she starts having opportunistic infections or when the CD4 count is below 200 cells per millimetre in the presence of HIV infection. The time taken for HIV to develop into AIDS depends on the type and strain of the virus and host factors including age, co-infections, some genetic factors as well as the general health and nutritional status of the individual before and during the time of HIV infections. (FANTA, 2004)

Currently there is no cure for HIV/AIDS or vaccine to prevent it. Some therapies can however prevent, treat or even cure several of the opportunistic infections and relieve the symptoms associated with it. A group of drugs referred to as antiretroviral drugs (ARVs) directly attack the HIV and significantly reduce the rate of its replication in the body of the infected person by decreasing the viral load and thus slowing down the progression of the disease (FANTA, 2004).

Recognized in 1981(Pratt, 2003), HIV/AIDS has become, a global pandemic of concern and instead of decreasing, it keeps on increasing its incidence every year, throughout the world. As a result, life expectancy in a number of African countries has actually fallen since the late 1980s, after a steady rise from the 1950s to 1985 (Gibney et al., 2004).

HIV is a blood-borne virus and it has been isolated from blood, semen, pre-ejaculatory fluid, saliva, tears, breast milk and cerebrospinal fluid. It can be transmitted from one person to another in different ways such as: sexual transmission, injecting drug use, mother to infant, iatrogenic transmission and occupational exposure among others (Pratt, 2003).

2.2 Link between Food, Nutrition, Malnutrition and HIV/AIDS

In Africa, where more than 25 million people are living with HIV/AIDS, malnutrition and food insecurity are endemic (Piwoz and Preble, 2004). Nutrition and HIV/AIDS are strongly interdependent and thus malnutrition can both contribute and be a result of HIV progression. The relationship results to a vicious cycle where HIV weakens the immune system leading to more infections. Infections increase energy needs and at the same time cause anorexia. Heightened infections (in number and severity) lead to loss of appetite; which result to inadequate food intake and eventually malnutrition. Malnourished persons are at a greater risk of infections, creating more vulnerability to HIV, and so the cycle continues as illustrated in figure 2.1.

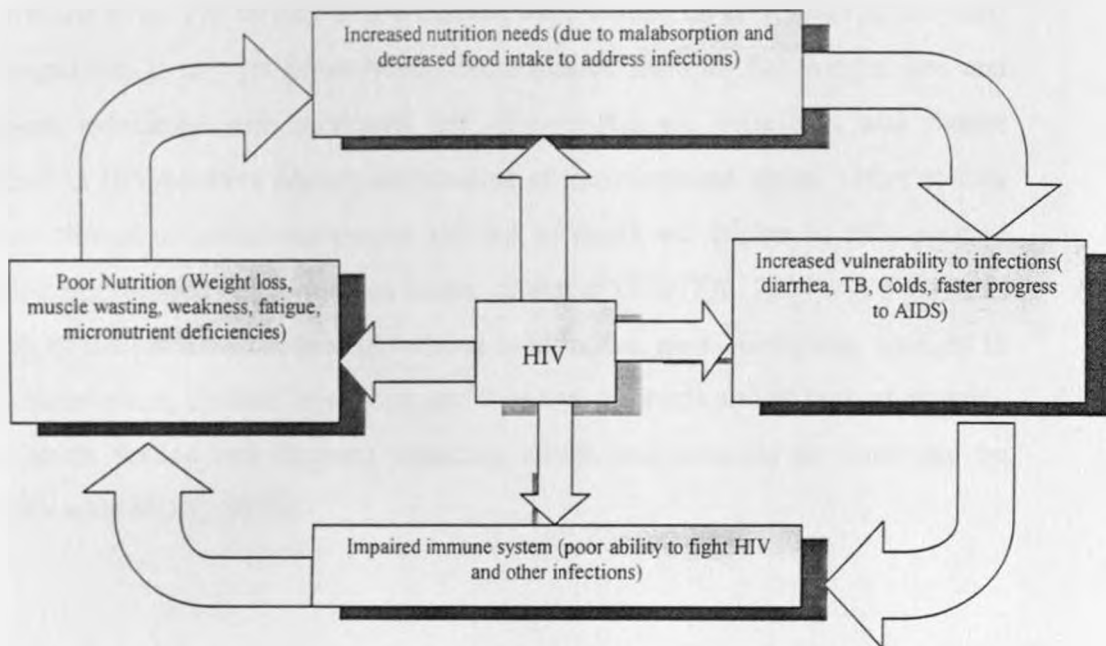


Fig.2.1: The cycle of Malnutrition and Infection in the context of HIV/AIDS.

Source: FANTA, 2002 (Rwanda MOH, 2006)

Whilst HIV may take years to progress to full blown AIDS, the negative effects of the virus on nutritional status can occur early in the course of the disease. Weight loss, a decrease in lean muscle and damage to the immune system, are more common for adults but they are also prevalent in children infected with HIV. The primary causes of under nutrition are well defined and are associated with deficiencies of one or more nutrients, due to inadequate ingestion, absorption or utilization and/or increased excretion or requirements. All the forms of malnutrition can be seen in HIV disease: Protein –Energy Malnutrition, Acute Phase Response and Cachexia "(Pratt, 2003). HIV infection affects nutrition through increases in resting energy expenditure, reductions in food intake, nutrient malabsorption and loss, and complex metabolic alterations that culminate in

weight loss and wasting common in AIDS. The effect of HIV on nutrition begins early in the course of the disease, even before an individual may be aware that he or she is infected with the virus. The impact of pre-existing malnutrition on HIV susceptibility and disease progression is not yet understood: Early studies showed that weight loss and wasting were associated with increased risk of opportunistic infections and shorter survival time in HIV-positive adults, independent of their immune status. Other studies showed that clinical outcome was poorer and risk of death was higher in HIV-positive adults with compromised micronutrient intake or status"(FANTA, 2004). A PWHA is more at risk of malnutrition because of reduced food intake, poor absorption, changes in the body's metabolism, chronic infections, and illnesses, anorexia and/or lack of appetite, diarrhoea, fever, nausea and frequent vomiting, thrush and anaemia as illustrated by figure2.2 (Rwanda MOH, 2006).

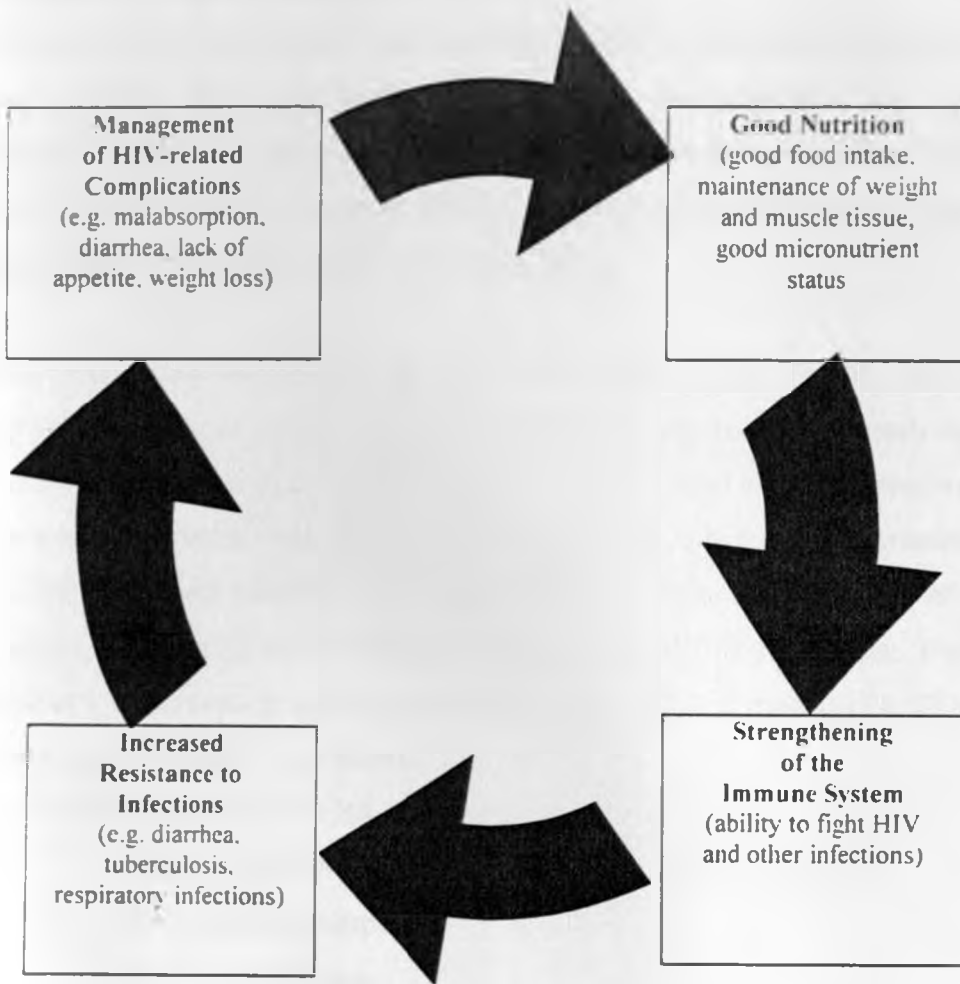


Fig. 2.2: Cycle of good nutrition and resistance to infection in the context of HIV/AIDS

Source: FANTA, 2004 (Piwoz and Preble, 2000)

In conclusion, adequate nutrition cannot cure HIV infection but is essential to maintain a person's immune system, to sustain healthy levels of physical activity, and for optimal quality of life (WHO, 2005).

2.3 Nutrient Requirements for PWHA

Good nutrition for all individuals and especially PWHA requires the consumption of an adequate amount in the appropriate proportions of macronutrients (e.g., proteins, carbohydrates, fats) and micronutrients (e.g., vitamins and minerals). Many people in resource limited settings are experiencing pre-existing malnutrition and that HIV infection simply worsens the situation (FANTA, 2004).

A PWHA needs more food to recover from illness because when the body does not get enough food, it uses energy and protein stored in fat and muscles. This leads to weight loss, muscle weakening and malnutrition from which it takes longer to recover. Once weight loss has occurred, it is difficult to regain it in case of HIV/AIDS (Rwanda MOH, 2006). The nutritional needs of HIV-infected persons depend on the stage of disease progression. The recommended intake levels are suggested based on the absence or presence of symptoms such as fever, diarrhoea, weight loss, and wasting (FANTA, 2004) and summarized in table 2.1 as follows:

- ❖ According to WHO, PWHA have extra energy requirements as a result of:
 - Energy used for HIV infection and opportunistic infections;
 - Nutrient malabsorption;
 - Altered metabolism.
- ❖ Protein, fat and vitamins requirements do not change: they remain as for healthy non-HIV-infected persons of the same age, sex, and physical activity level.

Table 2.1: Energy needs by phase of disease (Rwanda MOH, 2006)

Population Group	HIV phase	Energy requirement
Adults	Asymptomatic	10% increase
	Symptomatic	20-30% increase
Pregnant/ Lactating women	Asymptomatic	10%increase
	Symptomatic	20-30% increase
Children	Asymptomatic	10% increase
	Symptomatic(with no weight loss)	20-30% increase
	Symptomatic (with weight loss)	50-100%increase

2.4 HIV/AIDS and Food Security

Household Food security is a situation whereby every person, at all times, have physical, social and economical access to sufficient, safe and nutritious food to meet their nutrient needs for an active and healthy life. To achieve this, households must have the ability to produce and/or purchase, preserve food and have knowledge on how to use it (Rwanda MOH, 2006).

HIV/AIDS increases the risk of food insecurity through its impact on household productivity, labour, income, food stores and dependency ratios. People become weak and unable to work and produce due to the burden of the sickness. As a result, the three elements of food security namely availability, accessibility and utilization of food are affected in a negative way increasing vulnerability to HIV progression in the infected person's body (Piwoz and Preble, 2000). Apart from this, food insecurity may also lead people to adopt risky behaviours (i.e. sex for money/food) which in turn may increase the spread of HIV/AIDS.

The socioeconomic impact of the AIDS epidemic in African countries that are already struggling with conditions of extreme poverty has been disastrous (Piwoz and Preble, 2000), resulting to:

- Diversions of scarce resources meant for development, promotion of food security, health services, education and economic productivity to meeting costs for HIV prevention and management of AIDS at the national level;
- Affected family well being, including caregivers' ability to ensure adequate food and nutrition to the family due to illness and death from AIDS at family level.

In parts of Africa where farming is a primary occupation and nutritional requirements are met through local food production, HIV/AIDS in agricultural workers affects incomes, food productivity, and nutritional status. A study done by FAO in Malawi, Rwanda and Tanzania had predicted that by the year 2000, up to 25% of farm households could be affected by AIDS (Piwoz and Preble, 2000). As such, addressing food security is a prerequisite to improving livelihoods, preventing risky behaviours and malnutrition (Rwanda MOH, 2006).

2.5 Nutrition Status of PWHA

HIV/AIDS and nutrition are closely related: Malnutrition is both a contribution and consequence of the disease leading to most common signs of weight loss and thinness. These signs are common in all stages of HIV disease and specifically weight loss and emaciation associated with diarrhoea and are some of the most frequent manifestation of the disease in Africa (Pratt, 2003). If good nutrition is not considered for a PWHA, various types of malnutrition can result from it (nutrient deficiency specifically vitamins and mineral as well as protein energy malnutrition; in both adult and children. In turn, malnutrition has a negative impact on immune function, morbidity and mortality in PWHA. Iatrogenic factors (e.g. drugs used in the treatment of HIV disease) may also adversely affect nutritional status and the efficacy of drug therapies used in HIV disease management due to resulting weakened immunity arising from poor nutritional status; this is illustrated in figure2.3:

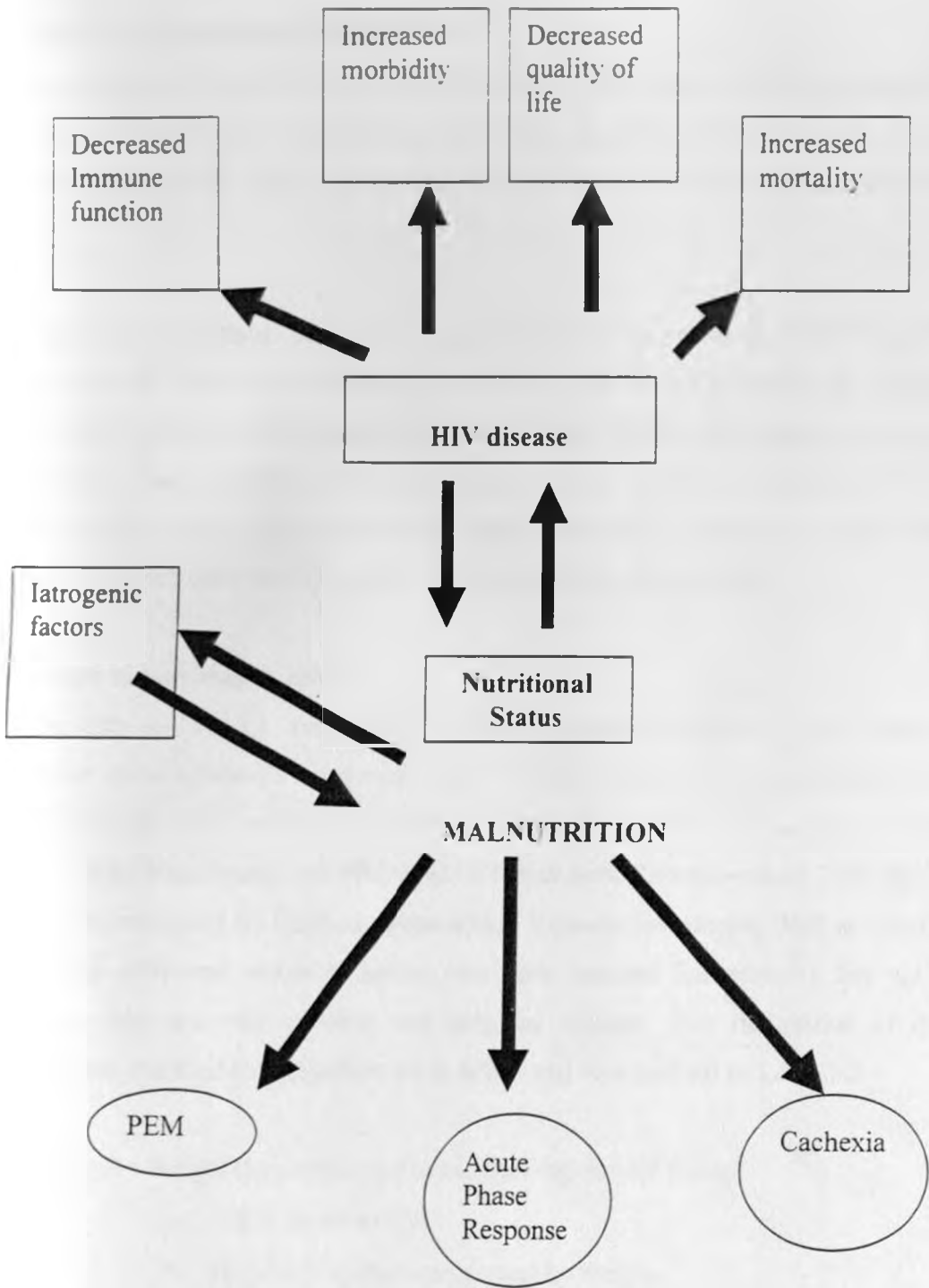


Fig.2.3: The relationship between HIV disease and nutritional Status (Pratt, 2003)

2.6 Nutrition Assessment for PWHA

Good nutritional status is of a great importance for the well being of everyone, especially for PWHA. This includes adults and adolescents, as well as the birth outcomes of pregnant women and for the survival and development of children as well as lactating mothers.

Assessing nutritional status of PWHA is important for their health as it helps in giving them nutritional advice and additional food (when needed) to minimize the negative impact of HIV/AIDS on their health. Thereby, delaying disease progression and maintain productivity (Rwanda MOH, 2006). The assessment of nutritional status is done by assessing body weight and micronutrient status especially vitamin A, Iron, iodine, selenium and zinc; these ones being key micronutrients that affect health.

Assessment of nutritional status

Measurements of weight and height, when considered together, give important information about a person's nutritional status. There are several different anthropometric measures, but the most common for adults (for both HIV positive and negative persons) are BMI (Body Mass Index) and MUAC (Mid Upper Arm Circumference). Although the cut-off points are based on European populations, Rwanda has adopted BMI as a method of assessing nutritional status of adults who have reached full maturity but not for adolescents who are still growing and pregnant women. The definitions of these measurements and their cut off points are as below and summarized in Table 2.2:

a) BMI= $\text{Weight (kg)/height (m}^2\text{)}$ has following cut-off points:

- <18.5: underweight
- 18.5-24.9: normal range/ healthy weight
- 25.0-29.9: overweight
- >30: obesity

Table 2. 2: BMI References for adults, including PWHAs (MOH Kenya, 2007)

CLASSIFICATION	BMI (KG/M²)	RISK OF CO-MORBIDITY
Severe malnutrition (Grade III)	<16.0	Very high
Moderate malnutrition (Grade II)	16.0-16.9	High
Mild malnutrition (Grade I)	17.0-18.49	Moderate
Underweight	<18.5	Risk of Clinical complications increased
Normal range	18.5-24.9	
Overweight	25.0-29.9	Mildly increased risk of co-morbidity
Obese	>30	Risk of co-morbidities associated with weight

b) MUAC: measurement taken at the midpoint of the upper arm, between the acromion process and the tip of the olecranon, using a flexible, nonstretch tape made of fiberglass or steel, or a fiberglass insertion tape (Gibson, 2005). The cut off points for MUAC are illustrated in Table 2.3.

Table 2.3: MUAC references for adults (PWHAs included)

Type of malnutrition	Average levels (male and female) in cm	Intervention
Normal	≥23	Education and counselling (if HIV+)
Mild malnutrition	18.5-23	Nutrition education/counseling (if HIV+); treatment and prevention of infection
Moderate malnutrition	16-18.5	Refer for Food supplementation. If also bilateral pitting oedema, inability to stand, or apparent dehydration, then refer for therapeutic feeding and/or admission for therapeutic care
Severe malnutrition	<16	Irrespective of clinical signs, admit for stabilization and/or therapeutic rehabilitation

(MOH Kenya, 2007)

In a given population (PWA included) when BMI is less than 18.5: that is an indicator of Chronic Energy Deficiency (FANTA, 2004) and the levels of prevalence and related mortality rates are illustrated in Table 2.4.

Table 2.4: Categories of Nutrition/Mortality Situation (FANTA, 2004)

	Wasting %	Crude Mortality Rates(deaths/10,000/day)applies to all adults and children
Low (Acceptable)	<5	<1
Medium (Poor)	5.0 to 9.9	1 to 1.9
High (Serious)	10 to 14.9	2 to 4.9
Very high (Critical)	≥15	≥5

BMI <18.5 is considered as wasting.

2.7 Dietary Diversity for PWA

Good dietary practices play an important role in maintaining a healthy lifestyle and healthy body. An HIV-infected person already has a weakened immune system. A nutritious diet can help maintain the proper functioning of the immune system and provides needed energy, protein, and micronutrients during all stages of the HIV infection. Maintaining adequate nutritional status means consuming a variety and adequate quantity of foods to meet energy, protein, and micronutrients (vitamins and minerals) needs (FANTA, 2004). A balanced diet will ensure that the individual consumes sufficient nutrients to maintain energy, normalize weight, and ensure the body's proper functioning. The main types of food people need to be healthy include energy-providing foods (carbohydrates and fats), body-building foods (proteins and minerals), and protective foods (vitamins and minerals). HIV-infected people have increased energy requirements because of HIV disease and co infections. Consuming a variety of foods from each of the main groups of energy sources on a daily basis is important to maintaining good nutritional status to help fight illness. In addition, good nutritional status may ensure that a person is able to survive an opportunistic infection such as Tuberculosis or pneumonia without further compromising health and nutritional status (FANTA, 2004).

Dietary diversity is a qualitative measure of food consumption that reflects household access to a wide variety of foods, and is also a proxy of the nutrient adequacy of the diet of the individuals (FAO, 2007). Dietary diversity can be measured using the dietary diversity tool of FAO (Appendix 3) which is a standardized questionnaire developed with the intention of universal applicability. As such, it is not culture, population or location specific (FAO, 2007). Studies have shown that an increase in dietary diversity is associated with socio-economic status and household food security (household energy availability). Studies done by Hoddinot and Yohannes (2002); and Hatloy et al. (2000) in several different age groups have also shown that an increase in individual dietary diversity score is related to increased nutrient adequacy of the diet (FAO, 2007).

Measurement of Individual Dietary Diversity

Individual dietary diversity can be measured using a questionnaire that has been developed by FAO (FAO, 2007). This one can aid in understanding if and how diets are diversified, and can also assess if households or individuals consume foods of special interest. The individual dietary diversity questionnaire includes all foods eaten by the individual of interest, consumed inside or outside the home, no matter where they were prepared. It includes 14 food groups: Cereals, vitamin A rich vegetables and tubers, white tubers and roots, dark green leafy vegetables, other vegetables including wild vegetables, vitamin A rich fruits, other fruits including wild fruits, organ meat (iron-rich), flesh meats, eggs, fish, legumes, nuts and seeds, milk and milk products, oils and fats. FAO uses a reference period of the previous 24 hours. According to Savy et al (2005), this does not provide an indication of an individual's habitual diet; however, it provides an assessment of the diet at the population level and can be useful to monitor progress or target interventions (FAO, 2007).

Measurement of dietary diversity can be affected by consumption patterns. The consumption patterns may be atypical during feast and celebration periods. It is therefore, not recommended to measure dietary diversity during national holidays/celebrations or during periods like Ramadan when consumption does not reflect the usual diet.

Analyzing dietary diversity data

Dietary diversity scores are calculated by summing the number of food groups consumed in the household or by individual respondent over the 24 hour recall period (FAO, 2007). Currently, there is no international consensus on which food groups to include in the scores in order to create the household dietary diversity score (HDDS) and individual dietary diversity score (IDDS). Work is however underway to determine the best set of food groups for IDDS as an indicator of adequate micronutrient intake.

HDDS and IDDS are calculated differently since the scores are used for different purposes. HDDS is used as an indication of Household economic access to food; thus items required for households such as condiments, sugar, and sugary foods and beverages are included in the score while IDDS reflects the nutrient adequacy of the diet and the food groups considered place more emphasis on micronutrient intake. In the IDDS questionnaire, sweets and spices, condiments and beverages are not considered but can be considered as additional data including bio-availability of micronutrients (consumption of coffee/tea) but not considered as part of the IDDS.

Using and interpreting dietary diversity

The population-level statistics of interest for dietary diversity are the *Mean Dietary Diversity Score and measure of distribution of the scores*. The dietary diversity scores facilitate the assessment of changes in diet before and after an intervention (improvement expected) or after a disaster such as failed crops (decline expected). The mean dietary diversity score allows comparison of sub-population: for example: communities undergoing a nutrition intervention compared to control communities, or HIV-affected households compared to others.

When interpreting the dietary diversity score, it is important to keep in mind the following:

- a) The dietary diversity score does not indicate the quantity of food consumed:
- b) Diet varies across seasons and some foods can be available in large quantities and at low cost for short periods:

- c) There may be urban/rural differentials in dietary diversity: variety is often much greater in urban and peri-urban centres where food markets are vastly supplied and easily accessible.

Creating indicators of special interest from specific food groups

At the population level, percentages can be calculated for households or individuals who consume food groups that are good sources of specific micronutrients, such as vitamin A or iron. This is calculated as follows:

$$\frac{\text{"Sum of individuals (or households) who consumed the specific food group"} \times 100}{\text{Total number of respondents"}}$$

From qualitative dietary diversity data, it is not possible to establish thresholds below which populations are not consuming sufficient vitamin A or iron. In general, low percentages of households or individuals consuming such food groups containing these micronutrients on a given day may be indicative of serious inadequacy for these diets that can lead to morbidity related to the micronutrient deficiencies. Percentages of those consuming special micronutrient rich food groups can also be used as one-time measure of a population or sub-populations, for on-going monitoring or to assess changes in diet such as before and after an intervention.

Assessing dietary composition at different dietary diversity levels

It is important to know which food groups are predominantly consumed at different levels of the dietary diversity score. This provides information on the foods eaten by those with lowest dietary diversity and those with a higher score of dietary diversity. Table 2.5 shows an example of what diets look like in Central Mozambique during mango season

Table 2.5: IDDS in Central Mozambique during mango season

Lowest dietary diversity (≤3 food groups)	Medium dietary diversity (4 and 5 food groups)	High dietary Diversity (≥6 food groups)
Cereals	Cereals	Cereals
Green leafy vegetables	Green leafy vegetables	Green leafy vegetables
Vitamin A rich fruits	Vitamin A rich fruits	Vitamin A rich fruits
	Oil	Oil
		Other vegetables
		Fish
		Legumes, nuts and seeds

Source: FAO, 2007

Conclusion

Dietary Diversity as a measure of household food access and food consumption can be triangulated with other food-related information to contribute towards providing a holistic picture of the food and nutrition security status in a community or broader locations.

2.8 Antiretroviral therapy and nutrition

Antiretroviral drugs (ARVs) are medications used to treat HIV/AIDS and are normally given to HIV positive people based on CD4 decline, high viral load and clinical symptoms of AIDS. These medications do not cure the HIV virus, but reduce the amount of virus in the blood and help delay the progress of the disease: hence improve quality of life and increase life expectancy. If the medications are able to raise the CD4 count, it means that they are working (FANTA, 2004).

Interactions between Anti Retroviral Therapy (ART) and food can significantly influence its success by affecting drug efficacy, adherence to drug regimens, and the nutritional status of PWHA. There are four principles for interactions between ARV drugs and food (FANTA, 2004):

- a) Food can affect medication absorption, metabolism, distribution, and excretion.
- b) Medications can affect nutrient absorption, metabolism, distribution, and excretion.

- c) The side effects of medication can negatively affect food consumption and nutrient absorption.
- d) Combination of medication and certain foods can produce unhealthy side effects.

Therefore, managing ART and food interactions is a critical factor in the extent to which ART is effective in slowing the progression of HIV/AIDS and improving the quality of life of the PWHA. Taking all of these into consideration, nutrition of PWHA on ARV drugs should be followed and ensured by health providers as well as giving them (PWHA) enough nutrition information on the drug they are taking.

2.9 Food aid approach in PWHA

In Africa, where there is a pre-existing situation of malnutrition and food insecurity due to shocks, such as drought, poor harvests and conflict that strain the ability of fragile households to function, HIV/AIDS further reduces their capacity to cope with these traditional stresses (FANTA, 2004). Food aid can play an important role in bridging short-term food gaps thus protecting the income and livelihood capacity of households affected by HIV/AIDS, and consequently supporting both short- and long-term food security.

The broad objectives of food aid programming in the context of HIV/AIDS include:

- a) Prevent malnutrition and mortality among the general population due to deteriorating food security, where HIV is one of the critical determinants of vulnerability: through provision of a general food ration integrated with complementary inputs;
- b) Prevent nutritional deterioration among individual PWHA, by providing general food rations and specialized foods with specific nutrient profiles and promote acceptance to treatment adherence by managing gastrointestinal side effects of ARVs by the patient;
- c) Provide incentives as a form of income in-kind to increase participation in the prevention of mother-to-child transmission, and promote other prevention.

treatments, or palliative care programs: as well as partial motivation for care and increasing enrolment in schools for orphans and vulnerable children:

- d) Protect livelihoods through supporting safety net programs, asset protection and food-for-work or training programs such as skill enhancement: targeting communities and households affected by HIV/AIDS.

Food can be obtained from external donations or locally. But as food aid is not a sustainable resource, it can be used as a short term solution based on set criteria with community involvement; especially PWHA. In the long term, sustainable strategies should include local ownership, skills development, infrastructure development, income-generating activities, and sustainable agricultural and natural resource development particularly focused on locally available resources and foods.

2.10 Institutional and Home-based Care for Severely Malnourished

PWHA

Severe acute malnutrition occurs once AIDS has developed but these adults or children with AIDS are often underweight and stunted even before AIDS symptoms are evident: this being the indirect impact of HIV on nutrition by underlying poverty which also results in acute malnutrition events.

Usually severe acute malnutrition is treated using therapeutic milk (F100) and special pastes such as Plumpynut produced by Nutriset in addition to medical care. In addition to centre-based therapeutic care, home-based care or community therapeutic care (CTC) can be used to deal with rehabilitation of severely malnourished adults and children by use of ready-to-use therapeutic food (RTUF) such as Plumpynut that have been successfully used for treating outpatients suffering from uncomplicated severe malnutrition in resources limited settings. It is a high energy nutrient dense food that meets strict formulations and all safety requirements for home-based care and is administered by trained providers including caregivers (FANTA, 2004).

2.11. Food supplements among PWHAs

Food supplements refer to any food or nutritional product that is provided to supplement or add to the daily diet (FANTA, 2004). Three types of supplements should be considered:

1. Food to manage HIV related symptoms and secondary infections, maintain weight and treat mild weight loss, manage the nutrition related side effect of ART and address nutritional needs in food insecure areas. These can be that are enriched, easy to prepare and digest and palatable like Corn-Soya Blend (CSB), vitamin A fortified vegetable oil and lentils;
2. Nutrition supplements for specific HIV positive groups at risk of malnutrition (dietary supplements);
3. Therapeutic foods for rehabilitation of moderate and severe malnutrition in HIV positive adults and children like BP100, F100 therapeutic milk, plumpynut (a peanut based paste) and other locally produced nutrient-dense foods.

2.12 National Guidelines for Food and Nutritional Support and Care for PWHAs in Rwanda

Guidelines are documents containing official instructions about the best way to do something (Longman, 1995). It is in that line that the Government of Rwanda has developed guidelines for food and nutritional support and care for people living with HIV/AIDS in Rwanda. These Guidelines are adopted and developed from the international guides for nutrition care and support for PWHAs for application and use in the Rwandan situation (Rwanda MOH, 2005b). They have been adjusted to enable programs and services provide consistent and sound recommendations to PWHAs and their caregivers, and contribute to the greater awareness of the importance of nutritional care and support in mitigating the impact of HIV/AIDS. The guidelines and protocols are in one document where nutritional recommendations and information are in the guidelines while the procedure on their use and application by service providers are summarized in the protocols.

The purpose of the guidelines outline actions that service providers need to take in order to provide quality care and support to PWHAs at various contact points. They address the specific food and nutrition needs of different categories of HIV/AIDS infected and affected people such as adults, adolescents, pregnant and lactating women, children and clients of antiretroviral therapy.

Food requirements of PWHAs are described and recommendations given on foods, feeding and eating practices to meet these requirements. Explanations on addressing nutritional aspects of HIV-related conditions and recommendations on practical nutritional care and support at the household, hospital as well as in other health facilities are also in the guidelines. It also provides aspects on the monitoring and evaluation systems for nutritional components of HIV interventions/programs. These guidelines are developed as a part of worldwide response to combat HIV/AIDS as it figures in goal number 6 of the Millennium Development Goals by 2015 when spread of HIV/AIDS is expected to have been stopped and reversal of its effects to have begun.

In Rwanda, the users expected to benefit from the guidelines are:

- a) Health service providers and extension workers, including those involved in testing, counselling, diagnosis, treatment and home-based care;
- b) Community-based organizational staff working with PWHAs;
- c) Planners in health, social, educational and nutrition services, who will develop local guidelines for nutritional care and support for PWHAs;
- d) International and national agency staff, who support national and community-based programs for PWHAs;
- e) Research and training institutions.

The message and information conveyed by the guidelines are on:

- i. Advocacy for good nutrition for all, but particularly for PWHAs;
- ii. More detailed and specific operational guidelines and materials to communicate to caregivers and PWHAs;

- iii. Provision of nutritional and dietary counselling to PWHA;
- iv. Design for monitoring and evaluation systems for nutrition systems for the nutritional components of HIV/AIDS programs/interventions.

These Guidelines provide a general approach to meet a variety of situations found in Rwanda. Each service provider is expected to adapt the recommendations to suit the local situations.

2.12.1 Areas addressed in the national guidelines for food, nutritional support and care for PWHA in Rwanda

Different areas have been addressed to ensure good nutrition and healthy life of PWHA; these are the main activities/ objectives to be met by all providers involved in the food and nutritional programmes in Rwanda:

2.12.1.1 Nutrition counselling for PWHA: this relates to counselling on nutrition related behaviour, which can improve the quality of life of PWHA.

The goals expected to be achieved in this area are to:

- i. Enable the client assess his/her nutrition and food needs clearly in the context of his/her living situation,
- ii. Empower the client to identify the alternatives she/he has for correcting a problem or meeting a need.
- iii. Enable the client address the constraints that may affect choice of alternatives,
- iv. Enable the client make the best choice depending on his/her circumstances.
- v. Empower the client to understand the pros and cons of each option and take responsibility for choices made.
- vi. Sensitise the client to express his/her innermost fears/feelings or concerns and develop the confidence to address them.
- vii. Help the client develop a positive attitude towards achieving behavioural change.

Counselling can be either *Individual* (through one-to-one contact) or *Group* (of value if the HIV status of most members of the group is unknown).

2.12.1.2 Nutritional Care and Support for PWHA: The area addresses different categories of PWHA according to their age and physiological status in how to maintain good nutritional status and how to prevent illness or other complications common with the HIV disease.

The need for nutritional advice and additional food to minimize the negative impact of HIV/AIDS on their health in order to delay disease progression and maintain productivity is emphasized.

Specific recommendations provided in the guidelines are on:

- a) Infant and young children feeding of children with or born to HIV positive mothers;
- b) Nutrition of pregnant and lactating mothers who are HIV positive;
- c) Nutrition of adults and adolescents with HIV/AIDS;
- d) Food and nutritional care and support for PWHA on medication.

These recommendations include:

- a) Regular monitoring of the nutritional status of the clients and implies availability of basic equipments such as balances, height meters and MUAC tapes for both adults and children;
- b) Regular recording of food and nutrition activities at facility level;
- c) Nutritional Rehabilitation of:
 - i. Severely malnourished PWHA; these ones are referred and treated to the hospital level;
 - ii. Moderately malnourished PWHA should be referred and followed up at a community based nutrition programme;
- d) Initiating productive IGA to improve food and nutritional status of the clients;
- e) Provision of food aid to the clients that are found to be food insecure; but this should be based on the criteria mentioned in the guidelines;
- f) Provision of dietary supplements to those clients that are found in need of them and based on an existing policy.

2.12.1.3 Food Security for PWHAs: the guidelines provide information on importance of good nutrition and maintenance of healthy and active life through being secure in food. Guidelines on improvement of food security through strategies that are aimed to increase food access and/or production like income generating activities initiatives and food aid strategies are provided.

The Government of Rwanda has developed a minimum food package for nutritional care and support of PWHAs (including children) in food insecure households as its options for the integration of nutrition as an essential package in the programmes; this is done by offering food aid to the participants who are found to be food insecure and based on guidelines criteria. This is in recognition of the fact that adequate nutrition may delay progression of HIV, decrease clinical symptoms and optimize the benefits of ARVs.

The package is divided into two parts namely:

Part I: Minimum Food Package for Nutritional Care and Support of PWHAs in food insecure Households.

Here the target clients are the malnourished PWHAs and HIV-positive pregnant and lactating women from households that are determined to be food insecure or with an HIV-exposed child. Admission criteria into this package are:

- a) BMI for adults ≤ 18.5
- b) Weight loss of 5% or more of body weight
- c) HIV-positive pregnant and lactating women
- d) HIV-exposed children between the ages of 0-24 months (or beginning at the time their mother ceased exclusive breastfeeding and HIV-infected children between the ages of 6-24 months.

The above indicators for admission can be complemented by community specific factors developed with local community social workers/leaders for the identification of food insecure households. Other indicators can be having eaten less than 2 meals on the day preceding the interview, having reduced the portion (size) of food served or having resorted to borrowing/bartering for food in the week preceding the interview.

Part II: Replacement Feeding and Complementary Feeding Packages for Nutritional Care and Support for HIV-exposed and infected children aged between 0 to 24 months in food insecure households

1. Eligibility: Assess the AFASS (Acceptable, Feasible, Affordable, Sustainable and Safe) conditions for mother (household) before recommending replacement feeding for HIV-exposed children between 0-6 months of age. Inclusion of the mother into the programme should be based on indicators of food insecurity.

AFASS conditions are conditions that an HIV positive mother has to meet before opting for replacement feeding or breast milk substitutes and means:

Acceptable: mother perceives no barrier to choosing replacement feeding for cultural or social reasons, or for fear of stigma and discrimination.

Feasible: mother (or family) has adequate time, knowledge, skills, resources, and support to correctly prepare breast milk substitutes and feed the infant 8 to 12 times in 24 hours.

Affordable: mother and family, with available community/or health system support, can pay for the cost associated with the purchase/production, storage and use of replacement feeds without compromising the health and nutrition of the family.

Sustainable: a continuous, uninterrupted supply and a dependable system for distribution of all ingredients (for example micronutrient supplements, fuel) and products needed to safely practice replacement feeding are available for as long as needed.

Safe: replacement feeding are correctly and hygienically stored and prepared and fed with clean hands using clean cups and utensils – no bottles or teats:

2.12.1.4 Monitoring and Evaluation: Implementation of the guidelines is subject to monitoring and evaluation to ensure successful utilization and effective application by service providers at all levels. Monitoring and Evaluation also generate information on the extent to which the main objectives of the guidelines are being met and improvements necessary to make them more efficient.

Those people or organizations charged with responsibilities of carrying out the monitoring and evaluation are:

- i. Ministry of Health at the national level;
- ii. Health district officers at district level;
- iii. Nutritionists, PMTCT/VCT heads at Health centre levels and
- iv. Health animators, PWHAs networks, NGOs, community-based organizations and other partners at community levels.

Monitoring is carried out by carrying out the following tasks:

- a) Develop a monitoring tool in a participatory manner;
- b) Interview people with HIV/AIDS to assess at what level the service providers were able to utilize and implement the guidelines;
- c) Hold a follow-up meeting with key persons in agencies using the guidelines in order to evaluate their experience with its use;
- d) Set up a system of periodic reporting to assess progress on the use of the guidelines.

2.13 Gaps in Knowledge

From the time the national guidelines for food and nutritional support and care for PWHAs have been adopted and disseminated in Rwanda (2005-2006), no evaluation has been done to provide information regarding their effectiveness and the level of achievement of their set objectives. It means that, from the time that they were supposed to have started being utilized, there is no information regarding their utilization or applicability by different providers involved in the food and nutrition programmes among which is the Capacity project.

In addition to these, there are few data on food and nutritional situations of adult PWHAs in Rwanda and as the guidelines are supposed to have a positive effect on the nutrition situations of the targeted PWHAs and specifically in the area covered by the Capacity project and as there is not yet such information since the guidelines have been adopted: there is need of finding it out. The study has looked at them by determining the nutritional status and individual dietary diversity of the targeted population.

2.14 References

1. FANTA, AED (2004). HIV/AIDS: A Guide for Nutritional Care and Support. 2nd Edition. Washington DC, USA. P10-106.
2. FAO (2007). Guidelines for Measuring Household and Individual Dietary Diversity. Version 2. (Prepared by FAO Nutrition and Consumer Protection Division with support from EC/FAO Food Security Information for Action Programme and the Food and Nutrition Technical Assistance (FANTA) Project. Rome, Italy. P1-17.
3. Gibney M.J., Margetts B.M., Kearney J.M. and Arab L. (2005). Public Health Nutrition. 1st edition. Blackwell Science, Noida, India. P7.
4. Gibson R.S. (2005). Principles of Nutritional Assessment. In: Anthropometric assessment of body composition. 2nd Edition. Oxford University press, New York, USA. P290.
5. Longman group limited (2005). Dictionary of Contemporary English. 3rd Edition. Great Britain, Bungay, Suffolk. P633.
6. Ministry of Health/ Kenya (2007) Nutrition and HIV/AIDS, A Tool Kit for Service Providers in the Comprehensive Care Centre. Ry- Park Services. Nairobi, Kenya. P31-34.
7. Piwoz E.G (2004). Nutrition and HIV/AIDS: Evidence, Gaps and Priority Actions. P1.
8. Piwoz E.G and Preble E.A (2000). HIV/AIDS and Nutrition: A Review of the Literature and Recommendations for Nutritional Care and Support in Sub-Saharan Africa. Washington DC, USA. P1-10.
9. Pratt R.J. (2003). HIV and AIDS, A foundation for nursing and healthcare practice. 5th Edition. Malta, UK. P2-231.
10. Rwanda Ministry of Health (2005a). National Health Sector Policy. Kigali, Rwanda. P3-6.
11. Rwanda Ministry of Health (2005b). National Guidelines for Food and Nutritional Support and Care for People with HIV/AIDS in Rwanda. Kigali, Rwanda. P1-75.
12. Rwanda Ministry of Health (2007). National Nutritional Policy. Imprimerie Papeterie Nouvelle, Kigali, Rwanda. P9-19.

13. Rwanda National Institute of statistics and ORC Macro (2006). Rwanda Demographic and Health Survey 2005. Calverton, Maryland, USA. P232.
14. USAID. FANTA. AED (2006). Categories of Nutrition/Mortality Situation. www.fantaproject.org. Email: fanta@aed.org
15. WHO (2005). Consultation on Nutrition and HIV/AIDS in Africa. Durban, South Africa. 10-13 April 2005

CHAPTER THREE

Utilization of national guidelines for food, nutritional support and care for people with HIV/AIDS in Rwanda in the Capacity project supported health centres

3.1 Abstract

In order to ensure effective nutrition interventions for people living with HIV/AIDS, the Government of Rwanda, in 2005, adopted the guidelines for food and nutritional support and care for people with HIV/AIDS to guide and harmonize food and nutrition activities. Since then, there have been no data confirming to what extent the set objectives are being met by the providers, and there is lack of information on food and nutrition situation of the target people with HIV/AIDS. The aim of the study was to evaluate the utilization of the national guidelines for food and nutritional support and care for people with HIV/AIDS in Rwanda in health centres that are supported by the Capacity project. Its purpose was to establish to which extent the national guidelines for food and nutritional support and care for people with HIV/AIDS are being utilized, the challenges that health providers and clients are facing in the service delivery as well as perceptions of the clients to the services. This was investigated under three specific objectives, two research questions and one hypothesis.

The study was cross-sectional and undertaken in seven health centres supported by the Capacity project. A sample size of twelve (12) health providers and one hundred and ninety two (192) people with HIV/AIDS was used to collect information from both health providers and their clients. Two different questionnaires were used: one for the service providers and the other for the clients. Sampling of the health centres and providers was purposive while selection of respondents per health centre consisted of all the clients who were present at the time of interview.

The findings showed that only one out of the twelve providers was a nutritionist, four of them agreed to be referring to the guidelines during their daily activities and only three

had the guidelines documents with them. All the providers agreed to be initiating income generating activities for the clients although 61% of the clients reported that they do not benefit from them. The national guidelines for food, nutritional support and care for people with HIV/AIDS in the Capacity project were being utilized at the extent of 27.9%; this led to the rejection of the hypothesis that the utilization of national guidelines for food and nutritional support and care for people with HIV/AIDS in the Capacity Project supported health centres is adequate. It also answered the research question that addressed utilization of the guidelines in the health centres. The results also showed a statistical difference in the utilization of guidelines between districts ($f=22.3$ and $p=0.000$) but no statistical difference between the nutritionists and the other service providers. Majority of the respondents (90.1%) had a problem of lack of food; this was reported by 90.1% of clients and confirmed by eleven of the twelve providers; which answered the second research question that was addressing the challenges faced by both providers and clients in the food and nutrition programmes. Satisfaction of the clients to the services offered was rated as moderate (61.1%).

It is thus concluded that the national guidelines of food and nutritional care and support in the Capacity project supported health centres are inadequately utilized. A food insecure situation with respect to clients was also established as explained by the lack of food confirmed by both clients and providers; this is a challenge to the satisfaction of the clients in the programme.

It is recommended to the Capacity Project and the Government of Rwanda in particular to ensure the implementation of guidelines recommendations in order to improve the health status of the people with HIV/AIDS by: training of service providers on the utilization/application of the guidelines, dissemination of guidelines documents to the providers, initiation of productive income generating activities as well as provision of food aid and dietary supplements; based on guidelines entry and exit criteria. It is lastly suggested to the Ministry of Health of Rwanda to carry out a national evaluation on the utilization of national guidelines for food and nutritional support and care for people with HIV/AIDS.

3.2 Introduction

Nutrition, Food and HIV/AIDS in Rwanda

HIV/AIDS pandemic affects approximately 3% of the Rwandan population (7.3% in the urban and 2.2% in the rural area respectively (RDHS, 2005). This situation is aggravated by poverty which affects 60% of the population and a high prevalence of malnutrition (more than 30%); (Rwanda MOH 2005a). The HIV/AIDS pandemic has worsened the already deteriorating nutritional situation.

The government of Rwanda has made enormous efforts in the fight against HIV/AIDS. Among them features the creation and adoption of national guidelines for food, nutritional support and care for people with HIV/AIDS with the aim of including nutrition as an integral component of a comprehensive package of the treatment and care strategy for people with HIV/AIDS so as to break the vicious cycle caused by the virus. These Guidelines were adopted in 2005 and disseminated in 2006 for utilization and implementation by service providers at all points of delivery of food and nutritional services of the country.

3.3 Methodology

3.3.1 The Study area and the people

(A)The Study Areas

The study was conducted in Rwanda, in Capacity project supported health centres located in three districts namely: Rulindo, Gicumbi and Nyagatare. These districts previously belonged to Byumba province but with the ongoing administrative reforms, they have been located in different provinces: Rulindo and Gicumbi are in the north province while Nyagatare is in the Eastern province (Appendices 4, 5 and 6).

Nonetheless, the three districts have some common characteristics since they border each other: they are in a rural setting and majority of the population are farmers. The main crops are beans, banana, sorghum, vegetables and fruits that are mainly produced as

subsistence for household consumption and industrial plantations of tea and coffee in the districts of Gicumbi and Rulindo.

The districts health care services in the three districts are based on the World Health Organization's Primary Health Care principles and are offered at health centres which are well distributed among the population. HIV/AIDS and malnutrition are amongst the main health problems of the country in general and also of those districts.

(B)The Capacity Project

The Capacity Project has been funded by the United States Agency for International Development (USAID) and implemented by Intrahealth International and partners. It helps developing countries strengthen human resources concerned with health to better respond to the challenges of implementing and sustaining quality health programmes.

In Rwanda, Capacity project supports health centres in different health fields including HIV/AIDS in the three districts. These health centres are: Tumba, Kinihira, Muyanaza, Rukozo, Kiyanza, Kajevuba and Rwahi in Rulindo. The health centres in Gicumbi are: Byumba, Rutare, Mukono, Rwesero, Kigogo, Munyinya, Gisiza and Giti, while the ones in Nyagatare are: Rukomo, Ntoma, Matimba, Karangazi, Cyabayaga and Rurenge. However, only nine of them are supported in VCT, PMTCT, ARV, Food Aid and Income Generating Activity programmes. Those health centres are: Kinihira, Muyanaza, Kiyanza, Rutare, Rwesero, Rukomo, Ntoma, Matimba and Rurenge.

3.3.2 Study Design

The design was cross-sectional and sought to assess the extent of utilization of national guidelines for food and nutrition support and care of PWHAs as well as determine the perceptions of the clients on the programme in Capacity Project supported health centres. Data collection was done by survey rounds whereby information was collected from each health centre that was selected.

3.3.3 Sample size determination

1. Twelve (12) health service providers involved in the food and nutrition care and support for PWHA per health facility were identified for collection of information needed on the use of guidelines in the seven selected health centres. Service providers involved in the food and nutrition programmes are usually one or two per health centre. Since there was selected a total of seven health centres with an expected total of fourteen (14) service providers where Capacity project offers food and nutrition support and care, a total of twelve (12) service providers gave the needed information (Fig 3.1).

2. One hundred and ninety two (192) PWHA were interviewed to determine their perceptions on the service delivery in the food and nutrition services of the health centres.

The calculation of sample size for the PWHA interviewed considered the following statistics: According to Rwanda Demographic Health Survey 2005, 2.2% of Rwandan rural population is affected by HIV/AIDS pandemic and this prevalence was used in the determination of the sample size.

- The sample size was calculated with a confidence interval of 95% and a power of 95%.

- The formula used was adopted from Fisher *et al.*, 1991 as follows: $n = z^2 (p q) / d^2$

Where:

n: the desired sample size

z: the standard normal deviate which is 1.96 for the 95% confidence interval

p: proportion of estimated PWHA in rural areas

q: 1 - p

d = the degree of accuracy desired, set at 0.05

- The calculated sample size equalled to $1.96^2(0.022)(0.978)/(0.05)^2 = 33.06$
rounded at 33
- Catering for attrition = $33 + (33 * 10 / 100) = 36$ **per survey round (or more); per each health centre.**

- From these calculations, a minimum of 36 PWHA was expected to be interviewed per each survey round/ per each health centre but with a high respondents rate the sample size was higher than 36: The total number of respondents that was expected to be 108(=36*3) became 192 as the respondents rate increased at every health centre as follows: Kinihira: 62, Rutare: 69 and Rukomo: 61. This was allowed as it makes the sample appears more representative of the universe (Majumdar, 2005).

3.3.4 Sampling Procedure

a. Sampling for Service Provider

The sampling procedure of providers is illustrated in Fig.3.1.

From the information provided by health providers, only nine out of twenty one health centres supported by the Capacity project were offering food and nutrition services to PWHA, but only seven of them were selected to be included in the study due to their accessibility. Meanwhile, all the service providers involved in food and nutrition assistance that were present at the time of interview were interviewed.

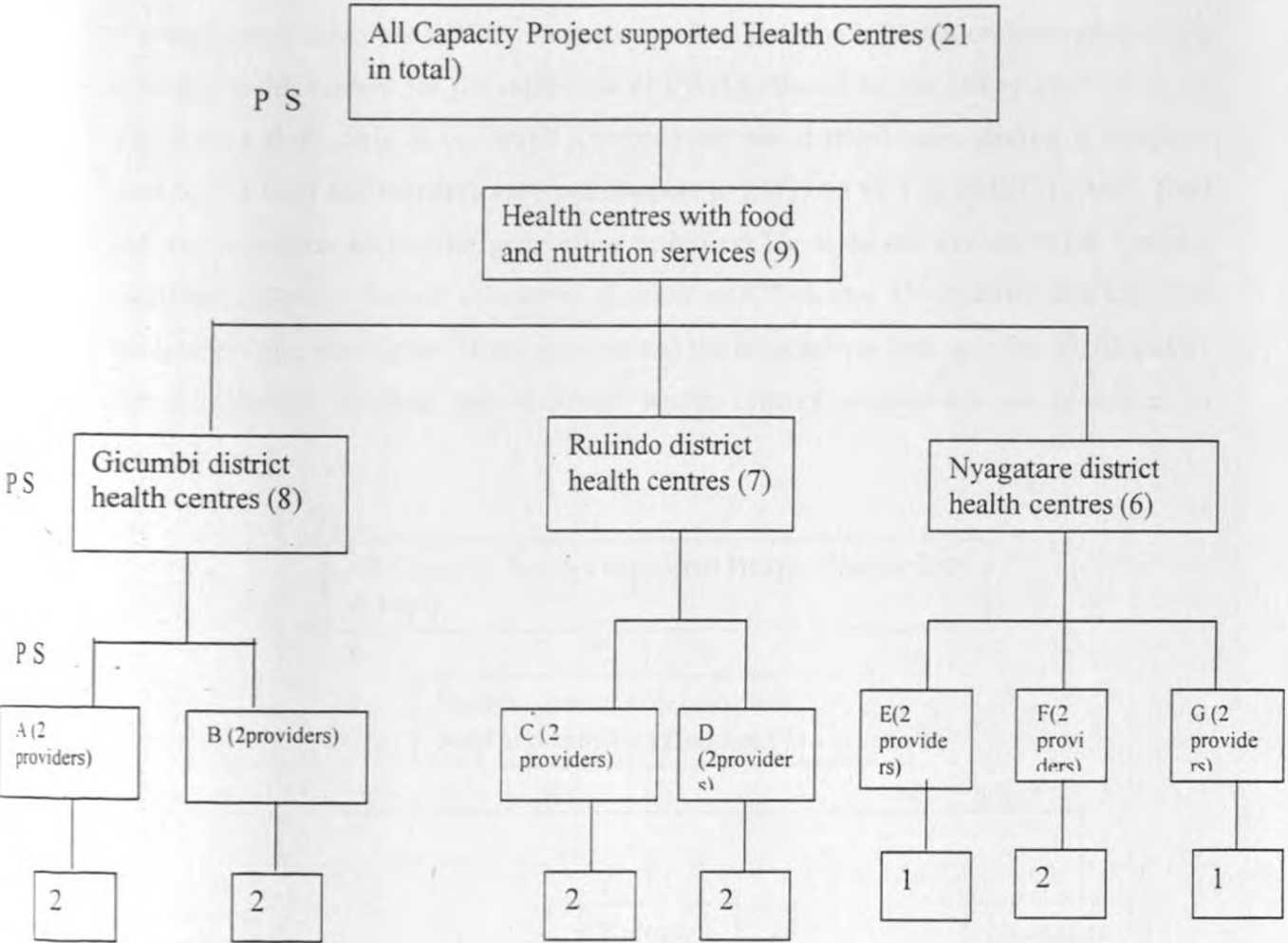


Fig. 3.1: Sampling procedure chart for providers

A=Rwesero; B=Rutare; C= Kinihira; D=Muyanaza; E=Ntoma; F=Rukomo; G=Rurenge

P S: Purposive Sampling

b. Sampling of the clients/PWHA

A minimum of thirty six PWHA were expected to give the information from each of the selected health centres for the interview of PWHA. Based on the information given by the project staff, only three health centres (one per district) were giving a complete package of food and nutrition care and support to PWHA (VCT & PMTCT, ARV, food aid and initiation to income generating activities). Those health centres were Kinyihira (Rulindo district), Rutare (Gicumbi district) and Rukomo (Nyagatare district). The respondent rate was higher than expected and the respondents turn out was 69, 62 and 61 for the Rutare, Kinyihira and Rukomo health centres respectively as illustrated in Fig.3.2

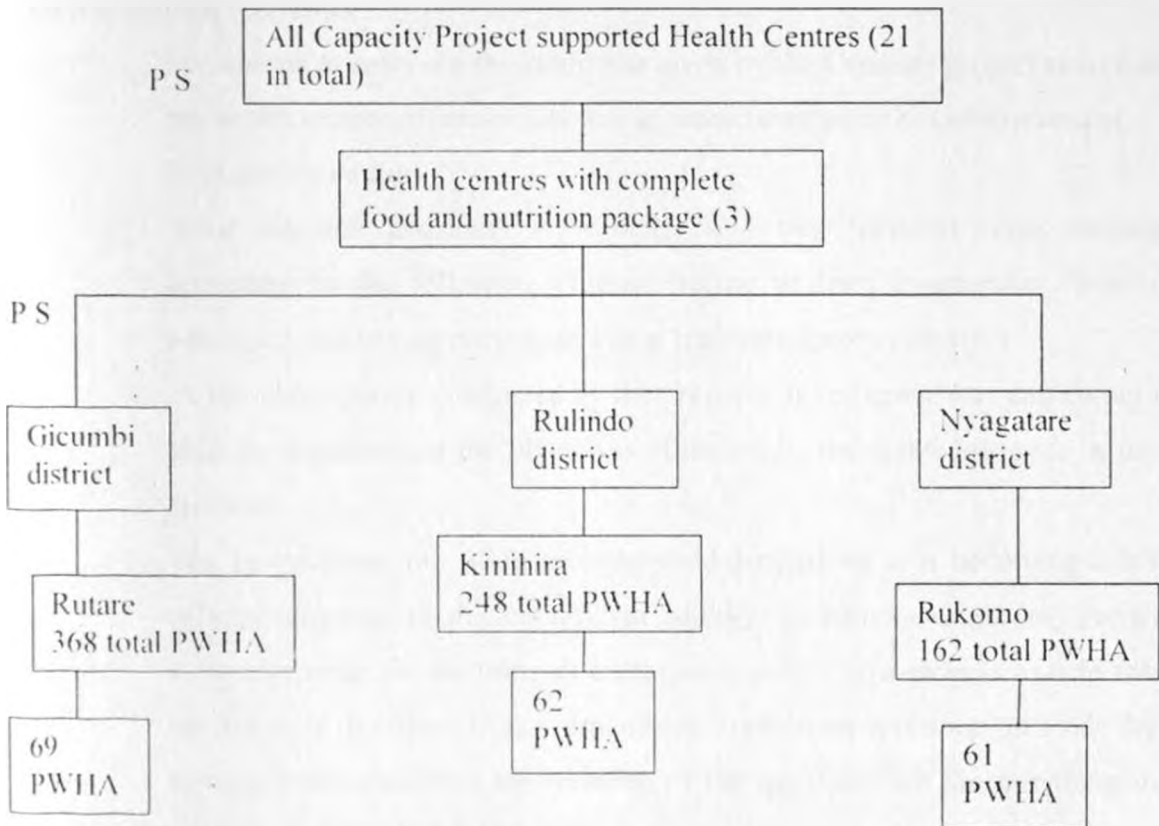


Fig. 3.2: Sampling procedure chart for PWHA

PS. Purposive Sampling

c. Inclusion and Exclusion Criteria

- Service providers included all health providers involved in the food and nutrition services of the health centres supported by Capacity project and who were available at the time of interview;
- PWHA included every PWHA aged from 18, currently involved in the food and nutrition programme of the health centres, who were available at the time of interview and willing to participate. Those who did not meet the above mentioned criteria were excluded from the study.

3.3.5 Research Activities

1. Permission to carry out the study was given by the Capacity project as well as the health centres officials; this was in accordance with the Government of Rwanda regulations.
2. Four research assistants (two males and two females) were recruited according to the following criteria: having at least a secondary level of education and having participated in at least one survey activity.
3. A two day training conducted by the principal investigator was carried out to help them understand the objectives of the study, the methodology to be used and tools.
4. The enumerators (all of them understood English as it is becoming a third official language of the country; in addition to Kinyarwanda and French) were explained the meaning of each question in Kinyarwanda to help them ask the right questions to the respondents; translation was done on a side draft to help them remember the meaning of the questions but the questionnaires were being filled in English.
5. To ensure that research assistants understand the questionnaires, they have been role playing the questions among themselves and on the second day of training, and a short session on pre-testing the questionnaires was conducted among six PWHA involved in food and nutrition programme in Gitega Health

centre which was not among those selected for the actual study. The main purpose of the pre-test was to ensure that the respondents understood the questions and answer them usefully; then adjust the questionnaire accordingly to ensure correct collection of the needed information.

3.3.6 Data Collection Tools

1. Questionnaires

Semi structured questionnaires were used to collect information on the extent of utilization of guidelines by the health service providers involved in the food, nutritional support and care of PWHA as well from PWHA themselves.

Two different questionnaires were used: one for the providers and another one for the service receivers (PWHA).

a) The provider's questionnaire (Appendix1) collected information on: background characteristics of the provider (qualification), awareness and utilization of the guidelines and challenges encountered in the use of Guidelines as well as suggestions given to solve them.

b) The clients' questionnaire (Appendix2) on the other hand collected information on clients' perceptions towards the service given in the food and nutrition programme.

2. Scaling Measurements

a) The extent of utilization of the guidelines was measured using a scale, based on a tool developed by the investigator as described in Table 3.1. It is tool adopted from Likert's scales usually known as summated rating scales (Majumdar, 2005).

This tool contained various indicators aspects of utilization found in the guideline document. Those aspects consisted of different services described in the guidelines document to be offered to PWHA by a service provider who is involved in the food and nutrition programmes of PWHA. However, this assessment did not consider the aspect of nutrition education or nutrition information given to the clients.

The assessment was done based on the answers that were given by the providers and each answer was ranked based on evidence: an indicator that was seen by the investigator or evidently put in place by the health centre was graded 5 points while the one that the answer was only relying on the provider's answer was graded 1 point. The sum of all the indicators made 76 points per each provider, and then the mean percent was calculated for the total for all the providers as reflected in Table 3.1. The order in which indicators appears in the table is random and does not have any weight in the measurement. The mean percentage was to be considered as the extent of the guidelines utilization and categorized into three based on the "three point scale" (Baipai, 1960) where:

75-100% = adequate utilization

50-74% = moderate utilization

0-49% = inadequate utilization

Table 3.1: Assessment form on utilization of guidelines for food, nutritional support and care for people with HIV/AIDS in Rwanda

	Aspect of utilization	Yes	No	
1	The provider knows/is aware of the existence of the Guidelines	1	0	
2	The provider uses the Guidelines/refers to it during his food and nutrition services to PWHA	1	0	
3	The provider has the Guidelines/Guidelines are seen by the researcher	5	0	
4	The provider has been trained on the use of the Guidelines	5	0	
5	The provider gives nutrition counselling to the PWHA	1	0	
6	The provider gives nutrition counselling to the Caregivers of the PWHA	1	0	
7	The provider does a regular monitoring of the nutritional status of the PWHA	1	0	
8	Nutrition assessment equipments	Height meter seen	5	0
		Balances seen	5	0
		MUAC tapes seen	5	0
9	Is the nutritional rehabilitation of moderately malnourished PWHA followed up at community level?	5	0	
10	Does the provider follow Guidelines indicators of food insecurity in food aid provision to PWHA?	5	0	
11	Does the provider follow the following Guidelines criteria in offering food aid?	BMI ≤ 18.5 for adults from food insecure households	5	0
		Weight loss of 5% or more of body weight if the PWHA is from a food insecure household	5	0
		HIV-positive pregnant and lactating women from food insecure households	5	0
		HIV-exposed children aged 0-24 or 6-24 months from food insecure households	5	0
		PWHA beginning ART from food insecure households	5	0
12	Does the provider initiate Income Generating Activities for PWHA in the programme?	1	0	
13	Does the provider offer dietary supplements to the clients according to their nutritional needs/requirements/deficiencies	5	0	
14	Indicators of food and nutrition seen in the provider's records	5	0	
TOTAL			76	

b) Perceptions of the clients on the services given to them in the food and nutrition programmes were also measured in a similar way that the extent of guidelines was measured; based on Likert's summated rating scale. It was done using a tool (table 3.2) and the indicators were also based on the guidelines contents.

Each indicator was given 5 points for yes and 0 for no. The sum of all the indicators made 45 points per each client, and then from the total for all the clients was calculated the mean percent. The mean percentage was to be considered as the level of satisfaction of the clients in regards to the service given to them and also categorized into three as above:

75-100% = clients are highly satisfied by the services

50-74% = clients are moderately satisfied by the services

0-49% = clients are poorly satisfied by the services

Table 3.2 Assessment tool for measuring clients' perception on the food and nutrition services

No.	Indicator	Yes=5 No=0
1	Does the provider give you information on how you have to feed yourself?	
2	Do you know how your weight has been progressing from when you have joined this program?	
3	Does the provider ask you if you have a nutrition related problem?	
4	Do you feel the provider understands you?	
5	Does the provider suggest to you solutions to your problem?	
6	Are you satisfied with the advice you are given by the provider?	
7	Does the provider visit you at home?	
8	Has your food security status improved from when you were enrolled in this program?	
9	Do you find the IGA of this program productive helpful can they sustain you?	
Total		45

3.3.7 Data Quality Control

The data collection tools were well designed and pre-tested. Questionnaires were reviewed by the principal investigator to confirm the validity, and were well kept till the time of data entry and analysis.

SPSS (Statistical Package for Social Sciences) version 12.0.1 for windows was used for data entry, cleaning and storage. During data entry, cleaning was done to rectify errors by running frequencies, tabulations and checking for outliers to avoid possible mistakes and obtain quality data. During the analysis, some data had to be further categorized for the analysis to be valid.

3.3.8 Data Analysis

The data from the questionnaires were entered, cleaned and analysed using SPSS software and Microsoft Excel, a spreadsheet package; the latter was used for creating tables and graphs charts.

1. Descriptive analysis involved statistics such as means, frequencies and tables the extent of utilization of the guidelines and perceptions of the clients.
2. Statistical tests that have been applied included:
 - i. Chi- square to measure probabilities of association between attributes;
 - ii. Test of equality of means to measure statistical difference of means for some variables;
 - iii. Correlation analyses used to determine associations between variables.

3.4 Results

3.4.1 Utilization of Guidelines by service providers

Table 3.3 provides data on utilization of guidelines by service providers. The information was obtained from 12 providers of whom were nine nurses (75%), two social workers (16.7%) and one nutritionist (8.3%). Apart from the nutritionist (8.3%) who is the only one with a post graduate level in nutrition, all the rest had a secondary level of education (91.7%). Ten out of the twelve providers knew were aware of existence of the guidelines; eight had been trained on their utilization application during their daily activities in food and nutrition, four agreed to apply them refer to them in their food and nutrition services and only three had the documents of guidelines with them.

All the providers accepted to give nutrition education information to their clients and as it will be seen latter, this was confirmed by the majority of the PWHA but this did not go further as it was not the objective of the study to determine the level of nutrition information given by the providers and nutrition knowledge of the respondents. All the providers reported to be offering nutrition counselling education to their clients while nine of them give counselling to the care takers of the beneficiaries. They all give both individual and group counselling.

All the providers agreed that they had initiated IGA for their clients although majority (61%) of the clients declared that those activities were not productive/ not helpful to them; they don't benefit from them

Monitoring of the nutrition status of the clients is generally done by only taking the weight of the clients as by the providers and as it was also reported by the clients (98.4%); few of the providers had height meters (six providers) and 75% had MUAC tapes.

Table 3.3 Utilization of Guidelines by service providers

Aspect of utilization		N=12	Score Mean	Standard deviation	
1	Providers who know are aware of the existence of the Guidelines	10	.83/1	.389	
2	Providers that have been trained on the utilization of the Guidelines	8	.33/1	.492	
4	Provider that use the Guidelines refers to it during their food and nutrition services to PWHA	4	1.25/5	2.261	
4	Provider that have the Guidelines Guidelines are seen by the researcher	3	3.33/5	2.465	
5	Providers that give nutrition counselling to the PWHA	12	1/1	0.000	
6	Providers that give nutrition counselling to the Caregivers of the PWHA	9	.75/1	0.452	
7	Providers that do a regular monitoring of the nutritional status of the PWHA	10	.83/1	.389	
8	Nutrition assessment equipments seen	Balances	11	4.5/5	1.4
		Height meter	6	2.5/5	2.6
		MUAC tapes	9	3.75/5	2.2
9	Providers that have nutritional rehabilitation of moderately malnourished PWHA followed up at community level	0	0/5	0	
10	Providers that follow Guidelines indicators of food insecurity during food aid provision	0	0/5	0	
11	Provider that follow the following Guidelines criteria in offering food aid?	BMI <18.5 for adults from food insecure households	0	0/5	0
		Weight loss of 5% or more of body weight if the PWHA is from a food insecure household	0	0/5	0
		HIV-positive pregnant and lactating women from food insecure households	0	0/5	0
		HIV-exposed children aged 0-24 or 6-24 months from food insecure households	0	0/5	0
		PWHA beginning ARI from food insecure households	0	0/5	0
12	Provider that initiate Income Generating Activities for PWHA in the programme	12	1/1	0	
13	Providers that offer dietary supplements to the clients according to their nutritional needs requirements deficiencies	0	0/5	0	
14	Providers that have the indicators of food and nutrition seen in the provider's records	12	1/1	0	

3.4.2 Extent of Utilization of the Guidelines by the Health Service Providers

a. Extent of utilization

Using the tool developed by the principal investigator to measure the extent of utilization of the guidelines following results were obtained out of a total of 76 points that were expected to be scored by the providers to be adequately utilizing the guidelines. The computed extent of utilization of guidelines by the interviewed providers ranged between 9 and 32 with a mean of 21.1, a median of 23 and a standard deviation of 7.2. The mean extent of utilization of guidelines was further calculated out of 100 and the mean extent of utilization was 27.9%, a median of 30.2% and a standard deviation of 9.6. Based on the set indicators, the mean extent of utilization of the guidelines was ranked as inadequate.

b. Tests of equality of means by f tests on extent of guidelines between different variables

a) There was a statistical significant difference ($P < 0.05$) between mean utilization of guidelines among:

- 1. Districts: Nyagatare (16.4%) had lower extent of utilization than Rulindo and Gicumbi which had 30.9% and 36% respectively ($f=22.3$; $p=0.000$).**
- 2. The providers who had the documents of guidelines had also better extent of utilization (37.2%) than those who did not have them (24.7%) ($f=5.49$; $p=0.041$).**

b) There was no significant difference ($P > 0.05$) between:

- 1. The nutritionist' extent of utilization and the others ($f=0.13$ and $p=0.911$);**
- 2. Those that have been trained on the utilization application of guidelines and the others ($f=1.158$ and $p=0.307$).**

Whether there was a statistical difference or not, all the providers' extent of utilization were inadequate (between 0 and 49%).

c. Hypothesis testing on utilization of guidelines

Further calculations have been done to test the hypothesis that: “The utilization of national guidelines for food and nutritional support and care for PWHA in the Capacity project supported health centres is adequate”: that means the utilization is above 75%. A one-sample t test has been used to test the stated hypothesis at 95% confidence as shown in Table 3.4: it was just to test if 27.85 % (calculated extent of utilization) is equal to 75%.

Table 3.4: Results on hypothesis testing on utilization of guidelines

Variable	Observation	Mean	Std. Error	Std. Dev.
Extent	12	27.85	2.75	9.55

Mean = mean (Extent percent) $t = -17$

H_0 : mean > 75 degrees of freedom = 11

H_a : mean < 75 H_a : mean! = 75 H_a : mean > 75

From that the null hypothesis was rejected as t calculated was falling in the rejection area. This is also supported by the calculations done as the computed mean extent percent was 27.9% that falls in the range of 0 to 49% which is inadequate.

3.4.3 Socio-demographic characteristics of the respondents

Majority of respondents shared almost same Socio-demographic characteristics: they are farmers (93.2%), Christians (95.3%), level of education not exceeding primary level (94.3%) and majority of them being women (85.9%).

3.4.4 Perceptions of PWHA on the Programme.

The perceptions of the clients on the service given to them in the food and nutrition programmes were measured by interviewing PWHA on various issues related to the guidelines' objectives in order to assess the quality of service given to them as it is summarized in Table 3.5 with the score mean and standard deviation of each indicator.

Table 3.5 Perceptions of the clients on the programmes' services

No.	Indicator	% of clients (N=192)	Score mean out of 5	Standard deviation
1	Clients that reported to be given nutritional information	91.1	4.5	1.4
2	Clients that know how their weight has been progressing from when they joined the programme	98.4	4.9	1.6
3	Clients that reported that the provider ask them if they have a nutrition related problem	80.2	4	1.9
4	Clients that find the provider understanding their situation	91.1	4.5	1.4
5	Clients that agreed the provider suggest them a solution to their problem	93.2	4.6	1.2
6	Clients that are satisfied with the advices given by the provider	93.2	4.6	1.2
7	Clients visited by the provider at their home	37	1.8	2.4
8	Clients who has their food security status improved from when they are enrolled in this program	10.4	0.5	1.6
9	Clients who found the IGA of the program productive helpful	38.4	1.9	2.4

i. Level of satisfaction of clients to the services given to them: Based on the indicators of perceptions of the clients to the service given, the mean perception of the clients was computed with a mean of 27.5 out of 45 with a median of 30 and a standard deviation of 5.62. The mean perception percent was 61.1% with a median of 66.6 and a standard deviation of 12.5; which falls under the category of moderate satisfaction; clients are moderately satisfied by the service given to them.

ii. Weight monitoring and nutrition counselling related questions: This was done by determining whether PWHA are given information on food and nutrition and if their nutritional status is monitored by knowing their weight progression. Among them, 91.1% of the clients agreed to receive nutrition information and 98.4% could tell about their weight progression from when they joined the programmes. Only weight was used to in gauging the nutritional status improvement as it is the easiest for the clients to understand; 42.7% of PWHA had increased weight, 32.8% said that their weight had not changed and 22.4% had decreased, 0.5% could not tell because their weight is not stable. Only 1.6% did not know about their weight progression. In addition to that, 80.2% agreed that the provider asked them if they have problems, 91.1% found the providers understood their problem situation, 92.7 said that the provider give them suggestions to solve their nutrition related problems and 93.2% said that they were satisfied with the solution they were given to solve the problem and only 37% said that they were visited at home.

iii. Food security related question: About their food security situation from when they joined the program; 89.6% said that their food security status had not improved and they still need help while 10.4% said that their food security has improved; they are able to generate income and feed themselves and their families; this question was asked because as per the guidelines recommendations, every programme is supposed to have an impact on the food security situation of the targeted population; which goes together with the initiation of IGA.

iv. IGA related questions: 30.7% of the respondents were not participating in the IGA of the program. Among those who belonged to the IGA, 61.6% said that the IGA initiated by the program were not productive; they could not sustain them.

3.4.5 Challenges of PWHA in the programme and proposed solutions

Among the respondents, 62% had a problem of insufficient/lack of food, 28.1% felt that lack/insufficiency of Income Generating Activities (to sustain them) is their problem, 2.6% said that the personnel designated to assist them are insufficient, 0.5% said that they lack nutrition education information while 6.8% did not have a problem.

About the suggestions to solve the problems found: 55.2% suggested increasing food aid, 37% suggested increasing income generating activities, and 3.1% suggested increasing personnel while 0.5% did not offer any suggestions.

3.4.6 Challenges of service providers in the food and nutrition of PWHA

All the providers agreed to have challenges in utilization application of the Guidelines and 83.3% of them said that their problem is insufficient or lack of Food aid for PWHA that are food insecure. The other problems mentioned are insufficient lack of Income Generating Activities (8.3%) and lack of qualified personnel (8.3%).

3.4.7 Suggestions of service providers to the solutions of the problems

Half of the providers (50%) of the service provider suggested to increase provide food aid to PWHA who are food insecure, 33.3% suggested increase of Income Generating activities while 16.7% suggested increasing personnel in quality and quantity in order to improve the services given to PWHA in the Food and Nutrition programmes of the health centres.

3.4.8 Summary on challenges and suggestions by clients and providers

Table 3.6 gives a summary on the challenges faced by the clients and their providers as well as suggestions to solve them.

Table 3.6: Challenges faced by providers and clients with suggestions

Providers (N=12)		Challenges Clients (N=192)		CONCLUSION
Challenges	Number of providers	Clients' challenges	%	
Insufficient/lack of food aid for PWHA	10	Insufficient lack of food aid	62	The clients and providers challenges in the programmes are similar and are ranked as follows: 1. Insufficient/ food aid to assist PWHA 2. Insufficient/lack of IGA to sustain PWHA 3. Insufficient personnel (in quality and quantity)
Insufficient /lack of IGA to sustain PWHA	1	Insufficient lack of IGA to sustain us	28.1	
Insufficient personnel(in quality and quantity)	1	Insufficient personnel (in quality and quantity) to assist us	3.1	
No problem	0		6.8	
Providers' Suggestions		Suggestions Clients' suggestions		
Increase food aid to PWHA	6	Increase food aid	55.2	Clients and providers have similar suggestions to the better working of the programmes which are ranked as follows: 1. Increase food aid to assist PWHA 2. Increase IGA to sustain PWHA 1. Increase of personnel (in quality and quantity)
Increase IGA to sustain PWHA	4	Increase IGA to assist us	37	
Increase personnel (in quality and quantity)	2	Increase personnel (in quality and quantity) to assist us	7.3	
Nothing	0		.5	

3.5 Discussion

1. The study findings revealed that the national guidelines for food, nutritional support and care for PWHA are inadequately utilized in the Capacity project supported health centres: the extent of utilization calculated based on indicators of utilization is 27.9%; which falls under the range of 0 to 49% that corresponds to inadequate utilization of guidelines; which was observed in all the providers and at all observed levels: district and health centre. This is mainly explained among others by a low number of providers utilizing the guidelines, very low number of providers having those guidelines at their place of work and different other aspects of the guidelines' application that are not put in place or followed by the provider(s).

Some of the examples are:

- i. Food aid provision to the clients does not follow the guidelines criteria;
- ii. Health centres do not have a community based program where to refer their clients that are moderately malnourished; which is a hindrance to the success of the nutritional rehabilitation of the affected clients and as it has been found that Community based health care remains the basis for so many effective health programmes (I ankester, 2007);
- iii. The guidelines recommend provision of dietary supplements when a client is found to be in need but such provision is not offered.

From all of these, the research question "How are the national guidelines for food and nutritional support and care for PWHA being utilized in the Capacity project supported health centres?" has been answered. The guidelines are not being adequately utilized in Capacity project supported health centres; they are inadequately utilized. The stated hypothesis that "The utilization of national guidelines for food, nutritional support and care for PWHA in the Capacity project supported health centres is adequate" has been also rejected.

This situation does not only show lack of implementation of the set of objectives of the guidelines, it also shows a weakness of the component of nutrition that should be an

integral component of a comprehensive package of the treatment and care strategy for PWHA so as to break the vicious cycle caused by the virus (Rwanda MOH, 2006). It also negatively affects the targeted PWHA's health as it has been seen that in developing countries, effective nutrition interventions are likely to have more an effect on human health than comparable investment in medical care (Merson et al., 2006).

2. The second research question of the study was to find out the challenges encountered by service providers and their clients (PWHA) in utilization of the national guidelines for food and nutritional support and care for PWHA. The challenges of the clients and providers were the same and ranked similarly:

- i. Insufficient food aid to assist PWHA;
- ii. Insufficient lack of IGA to sustain PWHA;
- iii. Insufficient personnel (in quality and quantity) to assist them.

The main challenges are lack of food aid and IGA which falls in the same situation of food insecurity among the PWHA supported by the Capacity project: those who mentioned either lack of food aid (62%) or insufficient IGA (28.1) as challenges were all meaning the same. That means 90.1% of PWHA in Capacity project supported health centres are food insecure as it was also approved by 91.6% of health providers (83.3% said that their clients lack food have problems of food and 8.3% said that they lack income generating activities). This is one of the consequences of HIV/AIDS among subsistence farmers as it has been observed in other parts of Africa where farming is a primary occupation and nutritional requirements are usually met through local food production, that HIV/AIDS in agricultural workers is affecting incomes, food productivity, and nutritional status (Pivoz and Preble, 2000). It is again known that the call for food may reflect the physical lack of food in the household, but it often echoes a lack of means or income to acquire food, despite the availability of food in the community or markets (FANTA, 2004).

Suggestions given to solve those problems are the same for clients as well as providers and were also contributing to the solution of the problem of food of PWHA in the programmes:

1. Increase food aid to assist PWHA
2. Increase IGA to sustain PWHA
3. Increase of personnel (in quality and quantity)

3. From the clients' perceptions, nutrition counselling is well perceived by majority of clients, monitoring of the nutritional status (by weight monitoring) is done as almost every client can tell about the progress of his/her nutritional status but the IGA of the facilities are not productive as clients claim that they do not assist them (said by 61.6%). 99.6% claim that their food security status does not improve since when they joined the programme and 63% are not visited at home; these last three statements show how the food and nutrition status of the clients is affected and it reflects their level of satisfaction in the programme.

3.6 Conclusions

From the study findings, the following conclusions can be drawn:

1. National guidelines for food, nutritional support and care for people with HIV/AIDS in Rwanda are being inadequately utilized in Capacity project supported health centres;
2. The level of satisfaction of the clients in the programme is moderate;
3. The main challenge of the PWHA enrolled in the food and nutrition programs of the Capacity project supported health centres is the same from the clients as well as their providers: food insecurity of the clients.

3.7 Recommendations

The study findings have shown that the national guidelines for food, nutritional care and support for PWHA is being inadequately utilized in Capacity supported health centres due to different reasons and factors.

1. For that, careful attention should be drawn by all health providers including the Capacity project and the Ministry of Health to implement the objectives of the guidelines. The implementation of the guidelines' objectives should bear in mind that the following aspects of utilization are put in place to the level of a health centre to ensure positive impact on the health of PWHA:
 - a. Increase the training of the providers on the utilization/application of the guidelines;
 - b. Ensure that all service providers have access to guidelines documents and put a monitoring system to ensure that they are referred to they are utilized in the food and nutrition programmes;
 - c. Ensure that providers do a regular monitoring of the nutrition status of the PWHA by providing basic equipments such as balances, height meters as well as MUAC tapes;
 - d. Ensure that each health centre is connected to a community based programme where to refer the moderately malnourished PWHA and for some other health related follow ups.
 - e. The policy of provision of dietary supplements should be put in place.

2. Increase the number of qualified nutritionists by formal and informal nutrition carrier training as this might be the reason of inadequate utilization because this might the cause of failure to advocate for the utilization as well as implementation of the guidelines due to lack of sufficient nutrition knowledge. This is more addressed to the Government of Rwanda and Ministry of Health in particular (this conclusion is due to the fact that among the twelve providers, only one was a nutritionist).

3.8 References

1. Bajpai S.R (1960). *Methods of Social Survey and Research*. 15th edition. Kitab Ghar, Kanpur, India. P327.
2. FANTA. AED (2004). *HIV/AIDS: A Guide for Nutritional Care and Support*. 2nd Edition. Washington DC, USA. P75.
3. Fisher A.A, Laing J.E, Stoeckel J.E and Townsend J.W (1991). *Handbook for Family Planning Operations Research Design*. 2nd Edition. The Population Council, New York, USA. P45.
4. Kathleen L. M. and Escott-Stump S. (2008). *Krause's Food and Nutrition Therapy*. 12th Edition. Saunders Elsevier, Canada. P 475.
5. Lankester T. (2007). *Setting up Community Health Programmes*. 3rd Edition. Macmillan publishers, Malaysia. P108.
6. Majumdar P.K. (2005). *Research Methods in Social Science*. Viva Books Private Limited, New Delhi, India P170-434.
7. Merson M.H., Black R.E. and Mills A. J. (2006). *International Public Health: Diseases, Programmes, Systems, and Policy*. 2nd Edition. Jones and Bartlett publishers, United States of America. P188.
8. Rwanda Ministry of Local Government (2007). *Nyagatare District Development Plan (2008-2012)*. P1.
9. Piwoz E.G and Preble E.A (2000). *HIV/AIDS and Nutrition: A Review of the Literature and Recommendations for Nutritional Care and Support in Sub-Saharan Africa*. Washington DC, USA. P1-10.
10. Rwanda Ministry of Agriculture and Animal Resources (2004). *National Agriculture Policy*. Kigali, Rwanda. P3.
11. Rwanda Ministry of Health (2005a). *National Health Sector Policy*. Kigali, Rwanda. P6.
12. Rwanda Ministry of Health (2005b). *National Guidelines for Food and Nutritional Support and Care for People with HIV/AIDS in Rwanda*. Kigali, Rwanda. P1-75.
13. Rwanda Ministry of Local Government (2007). *Gicumbi District Development Plan (2008-2012)*. Gicumbi, Rwanda. Pi.

14. Rwanda Ministry of Local Government (2007). Rulindo District Development Plan (2008-2012). Rulindo, Rwanda. P7.
15. Rwanda National Institute of statistics and ORC Macro (2006). Rwanda Demographic and Health Survey 2005. Calverton, Maryland, USA. P232.

CHAPTER FOUR

Food and nutrition status of people with HIV/AIDS enrolled in Capacity project supported health centres in Rwanda.

4.1 Abstract

In Rwanda 3% of the population is HIV positive. In addition to that, every year 80 thousand new cases are diagnosed, 49 thousand die from AIDS and all of these have a negative impact on food security, nutrition and household coping strategies (Rwanda MOH, 2006). Various interventions are being done by various governmental, non governmental, organizations and AIDS programmes with the aim of improving food and nutrition of people with HIV/AIDS but still very little is known about the food and nutritional status of adult people with HIV/AIDS in Rwanda. The objective and purpose of the present study was therefore to determine the food and nutrition situations of people with HIV/AIDS who are involved in the food and nutrition programmes at the Capacity project supported health centres. This was investigated under three specific objectives and two hypotheses: the specific objectives were sought to determine the socio-demographic characteristics, nutritional status, individual dietary diversity and other food related factors: for the clients while the hypotheses were expected first to prove whether there is a relationship between the socio-demographic characteristics and both the nutritional status and the individual dietary diversity; secondly between the nutritional status and the individual dietary diversity of the clients.

The study was cross-sectional and undertaken in three health centres supported by the Capacity project. A sample size of one hundred and ninety two (192) people with HIV/AIDS, among which one sixty five (165) were females and twenty seven (27) males involved in the food and nutrition programmes of the health centres was used to collect the required information. Selection of health centres was purposive while selection of clients per health centre consisted of all the clients who were present at the time of interview. Anthropometric measurements including height, weight and MUAC and determination of the nutritional status were performed on the basis of World Health

Organization guidelines. The information on individual dietary diversity was collected using a questionnaire based on one developed by the Food and Agriculture Organization. The rest of the information was collected using a structured questionnaire.

The findings showed that age of the respondents ranged between 19 and 74 years with a mean of 35.4 and a median of 35. Also, 93.2% of them were farmers with 94.3 % of them having a level of education not exceeding primary education and majority of them were females (85.9%). It was found that the mean individual dietary diversity score of interviewed people with HIV/AIDS was three (3) food groups per day per individual. Their nutritional status was distributed as follows: 8.4% were underweight, 83.1% had a healthy weight, and 8.5% overweight. Furthermore, except the gender characteristics, none of the rest of the socio-demographics was significantly associated with either the dietary diversity scores and/ or the nutritional status of the respondents; which led to the decision of partially reject the hypothesis that "there is an association between socio-demographic characteristics and both the individual dietary diversity and nutritional status of the people with HIV/AIDS enrolled in food and nutrition programmes of the Capacity project supported health centres". The other hypothesis that "there is a positive relationship between the nutritional status of the clients and their individual dietary diversity score" was rejected as a correlation analysis had shown a negative relationship which was not significant.

The findings led to the conclusion that the diet of the people with HIV/AIDS in the Capacity project supported health centres is inadequately diverse, they are food insecure and the level of malnutrition is high as they are confronted by the double burden of malnutrition (under and over nutrition).

Emphasis on nutrition education of people with HIV/AIDS, provision of food aid based on guidelines entry and exit criteria to help overcome problems of food insecurity and also initiating productive income generating activities to ensure sustainability of food security at household level and reduce level dependence among the population is highly recommended.

4.2 Introduction

In African countries that are already struggling with conditions of extreme poverty, the socioeconomic impact of the AIDS epidemic has been disastrous (Piwoz and Preble, 2000): At the national level, costs of HIV prevention and treatment of AIDS have diverted scarce resources from other development efforts, including efforts to promote food security, improve health services, and increase education and economic productivity. At the family level, illness and death from AIDS have profoundly affected family well being, including caregivers' ability to ensure adequate food and nutrition to the family. "

The incidence of poverty is still high in the country: over 60% of the population live in poverty and 42% in extreme poverty. The genocide of 1994 left a horrific legacy and a specific profile of poverty in the country: a significant reduction in the number of adult men, a large number of orphans, many households without permanent shelter, a reduction in small scale farming, an increase in the prevalence of HIV/AIDS and the loss of human resources and infrastructure (Rwanda MOH, 2005a).

In Rwanda, HIV/AIDS pandemic affects approximately 3% of the population (906,000 people): 7.3% in the urban area and 2.2% in the rural area (RDHS, 2005) and it goes on increasing as 80 thousand new cases are diagnosed every year (Rwanda MOH, 2006). This situation is aggravated by poverty that affects 60% of the population and a high prevalence of malnutrition (more than 30%); (Rwanda MOH, 2005b). Following the events of the 1990s and more directly of the 1994 genocide in Rwanda, the nutritional situation of the population has been worsening significantly and aggravated by the HIV/AIDS disease since then (Rwanda MOH, 2005). Decrease in rainfall, reduction in national food production, misdistribution of food at all administrative levels and within households, household food insecurity, ignorance of good nutrition practices, and the reduction of household purchasing power are some of the factors negatively influencing the nutritional status of the population (Rwanda MOH, 2006).

4.3 Methodology

4.3.1 The study area and the people

(A) The study areas

The study was conducted in Rwanda, in Capacity Project supported Health Centres located in three districts namely: Rulindo, Gicumbi and Nyagatare. These districts were previously part of Byumba province but with the ongoing reforms, they have been relocated into different provinces: Rulindo and Gicumbi are in the North province while Nyagatare is in the Eastern province; as illustrated in the geographical maps in appendices 4, 5 and 6. Nonetheless, these three districts share common characteristics: rural settings, majority of the population are subsistence farmers and the main crops are: beans, banana, sorghum, vegetables and fruits that are mainly produced for household consumption and industrial plantations of tea and coffee in the districts of Gicumbi and Rulindo.

All the districts health care is based on the World Health Organization's Primary Health Care principles and health facilities are well distributed among the populations. HIV/AIDS and malnutrition are amongst the main health problems of the country in general and also of the districts.

(B) The Capacity project

The Capacity Project funded by the United States Agency for International Development (USAID) and implemented by Intrahealth International and partners, helps developing countries strengthen human resources for health to better respond to the challenges of implementing and sustaining quality health programmes

In Rwanda, the Capacity project is supporting 21 health centres in different health fields including HIV/AIDS in the districts of Rulindo, Gicumbi and Nyagatare. The health centres in the district of Rulindo are: Tumba, Kinihira, Muyanaza, Rukozi, Kiyanza, Kajevuba and Rwahi. Those in Gicumbi are: Byumba, Rutare, Mukono, Rwesero, Kigogo, Munyinya, Gisiza and Giti while the ones in Nyagatare are: Rukomo, Ntoma, Matimba, Karangazi, Cyabayaga and Rurenge. However, only nine of them are being

supported in the programmes of VCT, PMTCT, ARV, food aid and income generating activities: Kinihira, Muyanza, Kiyanza, Rutare, Rwesero, Rukomo, Ntoma, Matimba and Rurenge.

4.3.2 Study design

The design was cross sectional sought to determine the socio-demographic characteristics, nutritional status, individual dietary diversity and other food related factors among PWHA that are participating in the Capacity project supported health centres in Rwanda. The study also collected information by survey rounds: by visiting each health centre that was selected.

4.3.3 Sample size determination

PWHA that were interviewed were from three health centres where Capacity Project offers Food and Nutrition Care and Support with the following programmes:

- i. PMTCT: Protection of Mother to Child Transmission
- ii. VCT: Voluntary Counselling and Testing
- iii. ARV (Anti Retroviral) programme:
- iv. Food Aid and Income Generating Activities Initiative (IGA) Programmes.

One hundred and ninety two (192) PWHA were interviewed to assess their food and nutrition situation. The calculation of sample size of the PWHA to be interviewed was done as follows: according to Rwanda Demographic Health Survey 2005, 2.2% of Rwandan rural population is affected by HIV/AIDS pandemic and this prevalence was used in the determination of sample size.

The sample size was calculated with a confidence interval of 95% and a power of 95%.

The formula used was adopted from Fisher *et al.*, 1991 as follows:

$$n = z^2 (p q) / d^2$$

Where:

n: the desired sample size

z: the standard normal deviate which is 1.96 for the 95% confidence interval

p: proportion of estimated PWHA in rural areas

q: 1- p

d= the degree of accuracy desired, set at 0.05

The calculated sample size was equal to $1.96^2(0.022)(0.978)/(0.05)^2=33.06$ rounded at **33**

Catering for attrition = $33 \cdot (33 \cdot 10 / 100) = 36$.

From these calculations, a minimum of 36 PWHA were expected to be interviewed per each survey round/ per each health centre but with a high respondents rate the sample size was higher than 36: the minimum number of respondents that was expected to be 108(=36*3) became 192 as the respondents rate increased at every health centre as follows: Kinyihira: 62, Rutare: 69 and Rukomo: 61: this was allowed as it makes the sample appear more representative of the universe (Majumdar, 2005).

4.3.4 Sampling Procedure

a) The procedure followed in sampling is illustrated in Figure 4.1.

1. The selection of Capacity project health centres was purposive based on the fact that those health centres were giving a complete package of food and nutrition care and support to PWHA (VCT&PMTCT, ARV, food aid and initiation to income generating activities).
2. Those health centres were Kinyihira (Rulindo district), Rutare (Gicumbi district) and Rukomo (Nyagatare district).
3. Selection of PWHA to be interviewed at every health centre was done by simple random sampling.
4. All the PWHA that were present on the day of interview, meeting the inclusion criteria and were willing to participate in the study were interviewed.

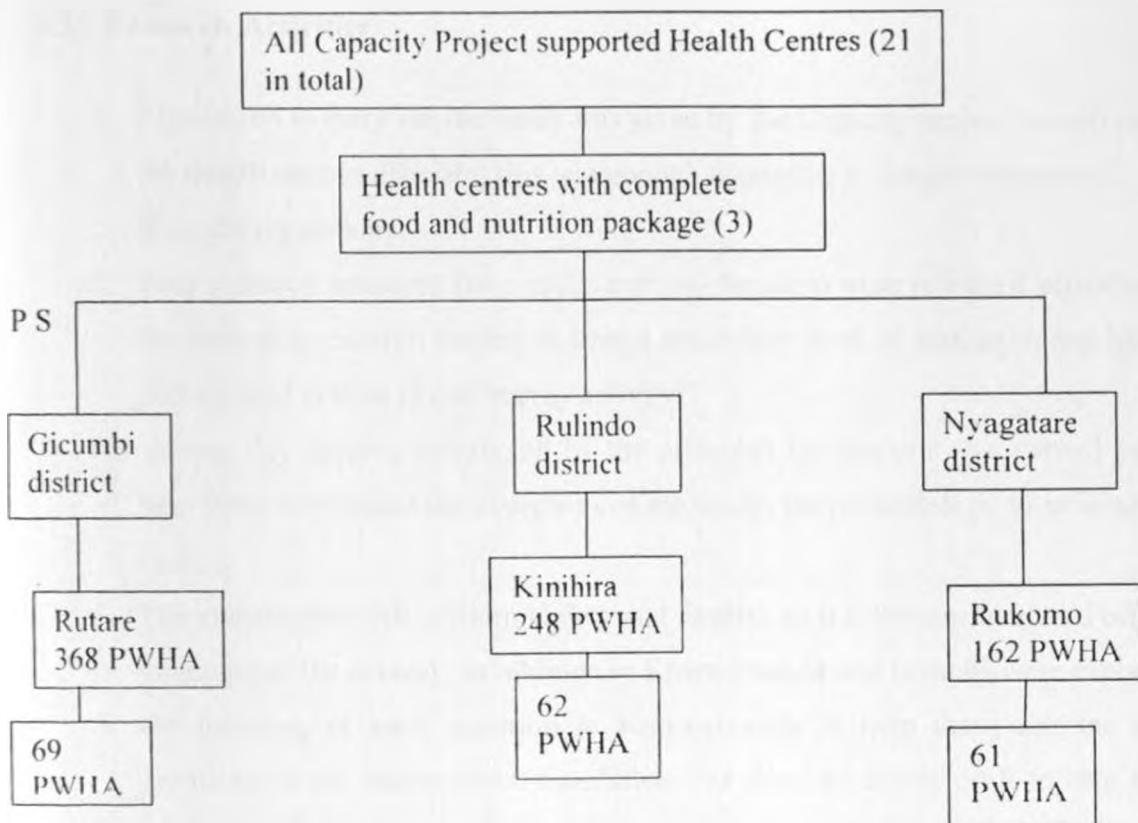


Fig. 4.1: Sampling Procedure Chart for PWHA

P S: Purposive sampling

b) Inclusion and Exclusion criteria

- Every PWHA aged from 18 and above, currently involved in the food and nutrition programme of the health centres, available at the time of interview and willing to participate. Respondents participated by a verbal consent, those who did not want to participate were not forced to participate. All of those who had accepted fully participated to the study.
- Those who were not meeting the above mentioned criteria were excluded from the study.
- The study included all women: whether pregnant or not but this was considered during assessment of nutritional status.

4.3.5 Research Activities

1. Permission to carry out the study was given by the Capacity project as well as by the health centres officials; this was enough according to the government of Rwanda regulations;
2. Four research assistants (two males and two females) were recruited according to the following criteria: having at least a secondary level of education and having participated at least in one survey activity;
3. A two day training conducted by the principal investigator was carried out to help them understand the objectives of the study, the methodology to be used and tools;
4. The enumerators (all of them understood English as it is becoming a third official language of the country; in addition to Kinyarwanda and French) were explained the meaning of each question in Kinyarwanda to help them ask the right questions to the respondents; translation was done on a side draft to help them remember the meaning of the questions but the questionnaires were filled in English;
5. The research assistants role played the questions among themselves to ensure they understand the questionnaires and on the second day of training, a short session on pre-testing the questionnaires was conducted among six PWHA involved in food and nutrition programme in Gitega Health centre which was not among those selected for the actual study. The main purpose of the pre-test was to give enumerators hands-on experience and to adjust the questionnaire accordingly to enhance validity and reliability of data.

4.3.6 Data Collection Tools

Information from the respondents was collected using a structured questionnaire (appendices 2 and 3) and the following information was collected:

1. Background characteristics on the respondents: age, sex, marital status, occupation, educational level and religion.

2. Information on some food related factors: about food security in the household, meals taken the day preceding interview, times of experiencing food insecurity in the households.
3. Individual Dietary Diversity Scores (IDDS) assessment questions using the FAO Individual Diversity questionnaire (appendix4). The IDDS questionnaire comprises 14 food groups(cereals, vitamin A rich foods, white tubers, dark green leafy vegetables, other vegetables including wild foods, vitamin A rich fruits, other fruits including wild fruits, organ meats(iron rich), flesh meat, eggs, fish, legumes-nuts-seeds, milk and milk products, oils and fats(and palm oil if applicable), FAO (2007). In this questionnaire, questions are presented in a way that: Yes=1 for those who have taken the food group item on the day preceding the interview and No=0 for those who have not. This tool collected information on food groups consumed (including food aid items for those who get them) by the individual respondent for the day preceding the interview (24 hour recall).
4. Assessment of the nutrition status of the respondents was done by determining:
 1. BMI for all men and women who did not report to be pregnant; pregnancy status was based on self reports.
 2. MUAC for all women to avoid overestimation of weight for those who were pregnant.
 - i. Body Mass Index (BMI) or Quetelet's index: it is an indicator of adult nutritional status that reflects thinness by adjusting body weight for height (Rwanda MOH, 2006). BMI is determined by the following formula: $\text{Weight (kg)} / \text{height (m}^2\text{)}$
 - o Weight measurements were done using adults weighing scales or bathroom scales that were calibrated every time before weighing is done using a known measurement. Respondents removed their shoes and other heavy clothing before weighing

was done. The measurement was being taken by two field assistants to avoid mistakes.

- Height measurements: were done using a modified tape measurer called microtoise which measures up to two meters (Gibson, 2005) and done to the nearest centimetre. The subject was asked to stand straight, looking straight ahead, feet together, knees straight, and heels, buttocks, and shoulder blades in contact with the vertical surface of the wall; arms hanging loosely at the sides with palms facing the thighs. Shoes were removed and with minimal clothing.

- ii. Mid Upper Arm Circumference (MUAC): was done to capture the nutrition status of all women with the intention of including those who were pregnant; as BMI does not take into account the extra weight of pregnancy. It was done using a tape measurer made of non stretch material. The left mid upper arm was identified: measurement taken at the midpoint of the upper arm and circumference taken at the nearest centimetre.

4.3.7 Data Quality Control

The data collection tools were well designed and pre-tested including the IDDS questionnaire that has been tested by FAO. Questionnaires were reviewed by the principal investigator to confirm the validity, and were well kept till the time of data entry and analysis.

SPSS (Statistical Package for Social Sciences), version 12.0.1 for windows was used for data entry, cleaning and storage. During data entry, cleaning was done to rectify errors by running frequencies, tabulations and checking for outliers to avoid possible mistakes and obtain quality data. During the analysis, some data had to be further categorized for the analysis to be valid.

4.3.8 Data Analysis

The data from the questionnaires were entered in the computer and analysed using SPSS software and Microsoft Excel, a spreadsheet package; this one was used for creating tables and graphs/charts.

1. Descriptive analysis involved statistics such as means, frequencies and tables and were used to determine socio-demographic characteristics, nutrition status, Individual Dietary Diversity Scores and other food related factors.
2. The statistical tests that were applied include:
 - i. Chi- square test: to measure probabilities of association between attributes;
 - ii. Test of equality of means to measure statistical difference of means for some variables;
 - iii. Correlation analyses were used to determine relationships between variables.
3. Cut off points were applied for different indicators such as:
 - a. BMI (weight/ height ²) cut off points based on WHO guidelines (Kenya MOH Kenya, 2007):
 - i.<18.5 : underweight
 - ii.18.5-24.9: normal/healthy weight
 - iii.25-29.9: overweight
 - iv.≥30: obesity
 - b. MUAC cut off points: (MOH Kenya, 2007):
 - i.<23cm : under nutrition
 - ii.≥23cm: normal/ healthy nutritional status

4.4 Results

4.4.1 Socio-Demographic Characteristics of the PWHA involved in the food and nutrition programs

1. Age, Gender and Marital status characteristics of the respondents

The age of the PWHA ranged from 19 to 74 years with a mean of 35.42, a standard deviation of 7.9 and a median of 35. majority (52.3%) of them were ranging between 29 and 38 years (outliers were not considered). Majority of the respondents were females (85.1%) among who 4.16% were pregnant; the rest were males (14.1%). In addition to that, majority (63%) of them were married, 22.9% were widowed, and the rest were single (5.2%) and divorced (8.9%).

2. Household headship and number of dependants

Among the respondents, 57.6% were head of the households where they stayed; 75.5% of them were women. Only 4.7% of the respondents did not have dependants. The rest had dependants ranging from 1 to 11 with a mean of 3.56 dependants per respondent and a median of 3 (outliers not considered).

3. Education level

Among the respondents, 47.9% had a primary level of education while only 5.7 reached the secondary level of education but did not finish. The rest (46.4%) did not have any level of education: among them, 34.9% of the whole sample neither knew how to read nor write; 6.8% could read and write and 4.7% knew how to read only.

4. Religion

The religion of the respondents was mainly Christian (95.3 %): Catholics were 54.2% and Protestants 41.1%; the rest (2.6%) were Muslims, Jehovah Witnesses and non-believers.

5. Occupation

The majority of the respondents were subsistence farmers (93.2%) while the rest were doing different jobs (casual work and small scale business).

All the details on socio-demographic characteristics of the respondents are summarized in Table 4.1.

Table 4.1: Socio-demographic characteristics of the respondents

Demographic Characteristics	n	Percentage
Age in years (N=189)		
18-28	37	19.6
29-38	99	52.4
39-48	41	21.7
49-74	12	6.3
Gender (N=192)		
Males	27	14.1
Females	165	85.9
➤ Pregnant	8	4.16
➤ Not pregnant	157	81.77
Marital status (N=192)		
Married	121	63
➤ Monogamously	110	57.3
➤ polygamously	10	5.7
Single	10	5.2
Widowed	44	22.9
Divorced	17	8.9
Educational level (N=192)		
None	89	46.4
Primary	92	47.9
Secondary	11	5.7
Post secondary	0	0
Occupation (N=192)		
Farmers	179	93.2
Others(casual work)	13	6.8
Religion (N=192)		
Catholic	104	54.2
Protestants	79	41.1
Muslim	4	2.1
Jehovah witness + No religion	5	2.6
Household headship (N=191)		
Head	110	57.6
Not head	81	42.4

4.4.2 Individual dietary diversity of the PWHA

1. Food groups' consumption

Food groups' consumption among groups of PWHA was distributed in Table 4.2. It shows the total percentage of PWHA who took the individual food groups and their distribution within sexes: there was no statistical difference among means of different groups of respondents (men, pregnant women and not pregnant)

Table 4.2 Food groups consumption by PWHA in a descending order

No.	Food groups	% of PWHA who took		
		Total (N=187)	Men (n=26)	Women (n=161)
1	Legumes, Nuts and Seeds	78.6	61.5	81.4
2	White tubers and roots	58.8	69.2	57.1
3	Dark green leafy vegetables	48.7	46.2	49.1
4	Oils and fats	40.6	26.9	42.9
5	Vitamin A rich vegetables and tubers	37.4	26.9	39.1
6	Cereals	33.7	42.3	32.3
7	Vitamin A rich fruits	4.8	0	5.6
8	Other vegetables including wild vegetables	4.3	7.7	3.7
9	Fish (fresh, dried or shellfish)	4.3	3.8	4.3
10	Other fruits including wild fruits	3.7	0	4.3
11	Milk and Milk products	2.7	7.7	1.9
12	Flesh meats	2.7	3.8	2.5
13	Organ meats (iron-rich)	1.1	3.8	0.6
14	Eggs	0.5	0	0.6

2. Individual dietary diversity scores (IDDS)

The individual dietary diversity scores among PWHA were distributed as follows: the scores ranged from 1 to 7 (excluding outliers) with a mean of 3.18, a median of 3 and a standard deviation of 1.32. The distribution of respondents according to their IDDS is presented in Figure 4.2.

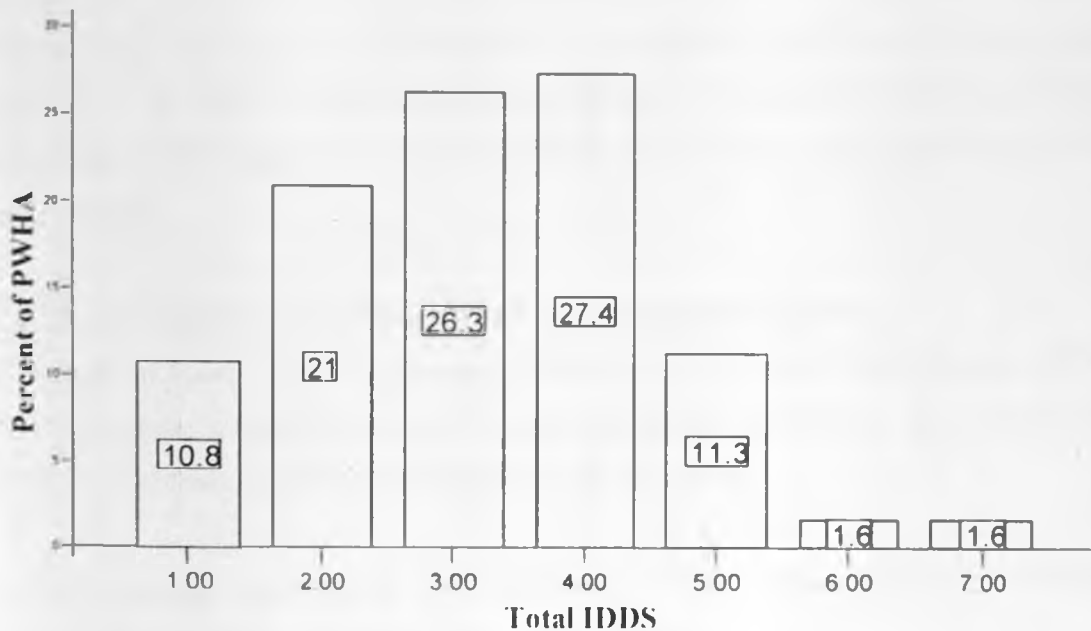


Fig. 4.2: Distribution of PWHA by IDDS

3. IDDS distribution among the groups of PWHA

The mean IDDS among the respondents are illustrated in Table 4.3

Table 4.3: The mean IDDS per groups of PWHA

Group	N	Mean IDDS
All the PWHA	192	3.18
Pregnant women	8	3.75
Not pregnant women	157	3.15

The mean scores were not statistically different ($p > 0.05$) between groups of PWHA.

But when the mean IDDS were considered between sexes, a one tail test at 95% confidence interval revealed that the mean scores are statistically different ($p < 0.05$): Women had a higher mean IDDS (3.175) than men (2.889) with $t = 2.47$ and $p = 0.014$:

gender was the only one socio demographic characteristic that was significantly associated with HIV/AIDS; the other socio-demographic characteristics were not significantly associated to it ($P>0.05$). The other socio-demographic characteristics had the following values using F tests: age: $f=0.255$ and $p=0.775$; religion: $f=0.218$ and $p=0.641$; marital status: $f=0.120$ and $p=0.730$; household headship: $f=0.212$ and $p=0.645$; number of dependants: $f=0.927$ and $p=0.337$; education level: $f=0.199$ and $p=0.656$; occupation: $f=0.000$ and $p=0.984$.

4.4.3 Food related factors of the PWHA involved in the program

i. Source of food: 79.7% grow their food and buy the small items like salt and oil. 16.2% purchase it and 2.6% receive food aid in addition to what they grow while 1.6% borrows food from neighbours when they do not have food.

ii. Food shortage occurrences in the household: 79.2 % reported that they experience food shortages in their households while 20.8% did not.

Among those who experience food problems or lack of foods:

- 16.6% experience it always (more than 10 days in a month)
- 76.8% experience it sometimes (2 to 10 days in a month)
- 6.6% - rarely (one day in a month)

iii. Eating Situation of the day preceding the interview: A 24 hour recall showed that:

- Ninety nine percent (99%) of the interviewed PWHA had eaten and 1% had not eaten because there was no food at all.
- The meals taken were as follows: 89.1 % had taken dinner, 69.8% lunch, 15.6% breakfast, while consumption of in between snacks was respectively 3.6% and 1.6% for morning snack and afternoon snack; as illustrated in figures 4.3 and 4.4

PWHA distribution by types of meals

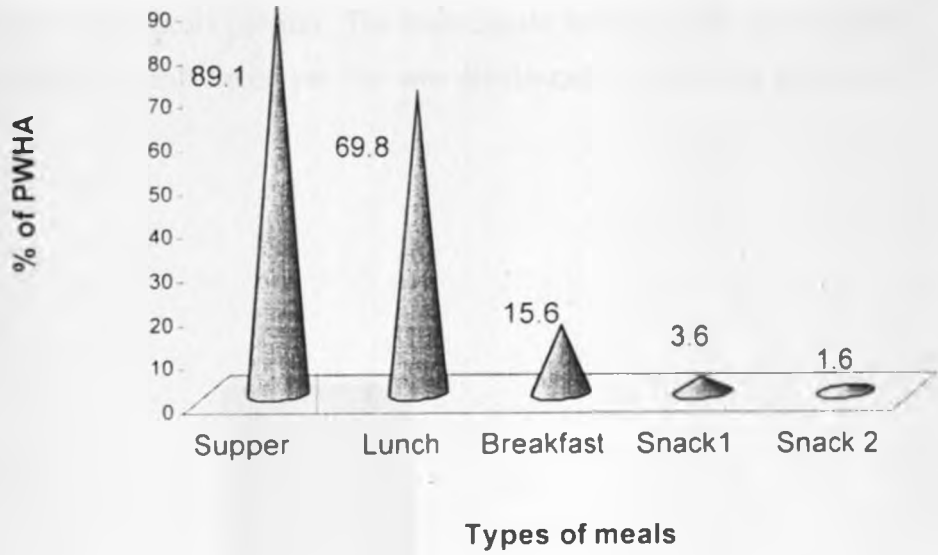


Fig.4.3: Meals intake distribution

The distribution of PWHA by the type of meals and according to gender is illustrated in Figure 4.4

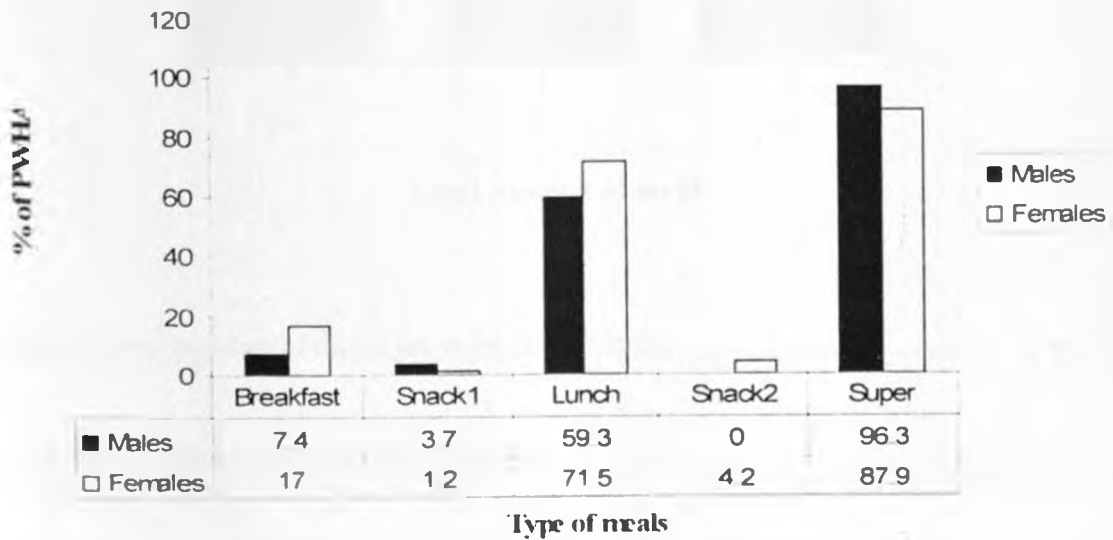


Fig.4.4: Distribution of PWHA by types of meals taken on the previous day by gender

iv. **Number of meals taken on the previous day:** The number of meals taken in the last 24 hour period ranged between 1 and 3, with a mean of 1.82, a median of 2 and a standard deviation of 0.6524 meals per day. The main meals taken per day were supper and lunch. The number of meals taken per day was distributed as shown in Figure 4.5

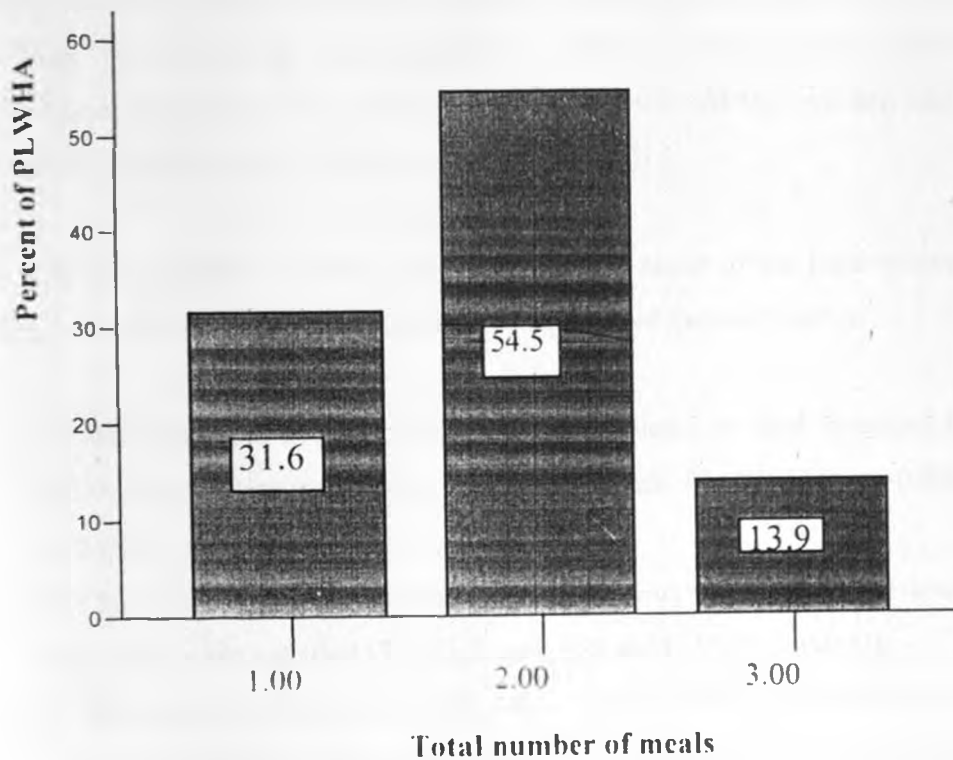


Fig.4 5: Total number of meals taken by respondents

v. Situation of the previous day's eating

- A 24 hour recall showed that 35.8% of the respondents were satisfied. 63.2% were not satisfied because the food was not enough; hence they had been obliged to reduce the portions to share with others and 1. % did not eat at all because there was no food.

vi. **Number of dependants:** only 4.7% of the respondents did not have dependants. The rest had dependants ranging from 1 to 11 with a mean of 3.48, a median of 3 dependants per respondent (when outliers are excluded) and a standard deviation of 2.14.

4.4.4 Factors associated with IDDS

1. Chi-square analyses and Tests of means did not reveal significant differences between IDDS among different socio demographic characteristics of the respondents: age, marital status, number of dependents, household headship, occupation, education level and religion ($P>0.05$). The only statistical difference among the socio demographic characteristics was found between sexes: a t-test showed that women had higher IDDS mean (3.17) than men (2.88) with $t=2.47$ and $p=0.014$.

2. Statistical differences between IDDS means of some of the food related factors were observed; both by Chi-square and tests of equality of means (f tests):

i. PWHA who had ever experienced food problems in their households had a lower IDDS means than those who never experience it ($X^2=31.9$; $p=0.000$ and $f=15.9$; $p=0.000$):

ii. PWHA who were not satisfied by the previous day's food had lower IDDS than those who were satisfied ($X^2=21.5$; $p=0.006$ and $f=15.9$; $p=0.000$):

iii. Those who had taken breakfast had a higher IDDS mean than those who had not taken ($X^2=18.4$; $p=0.018$ and $f=12.2$; $p=0.001$) and those who took lunch had a better IDDS mean than those who had not taken ($X^2=29.1$; $p=0.000$ and $f=27.8$; $p=$) but there was no significant difference among those who had taken supper and the in between snacks ($P>0.005$); this is due to the fact that the majority of the respondents had taken supper and did not take snacks.

3. Correlation analyses:

There was a significant positive correlation between the IDDS and the total number of meals taken on the previous day of interview ($r=0.335$ and $p=0.000$). This was confirmed by the test of equality of means (f test) as respondents with higher number of meals had

more IDDS than those with less meals; this was significantly different ($f=11.8$ and $p=0.000$): those PWHA who had one meal had lower IDDS (2.67) than those with two meals (3.2) and those with 3 meals (4.15).

4.4.5 Nutritional status of the PWHA involved in the food and nutrition programmes

a) All the respondents except pregnant women had their BMI calculated and it was distributed as follows: they ranged from 15.22 to 30.8 with a mean of 21.90, a median of 21.73 and a standard deviation of 2.41 (when outliers are excluded).

The nutritional status of the respondents was distributed as illustrated by figure 4.6

Nutritional status (BMI) distribution all PWHA except pregnant women

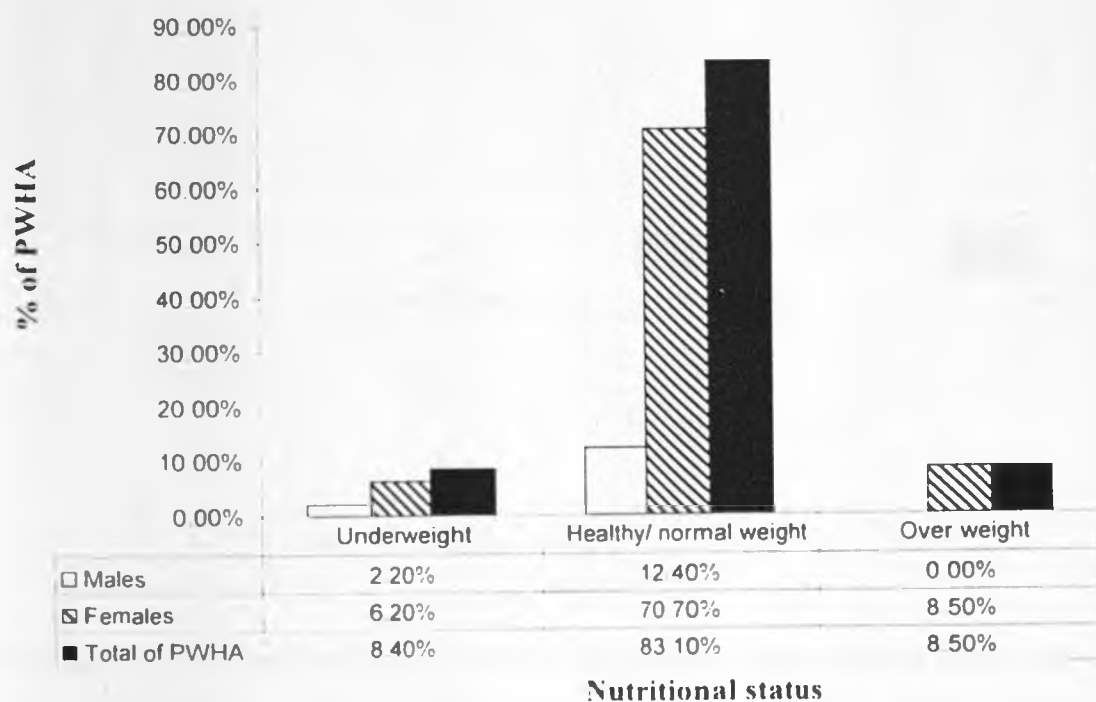


Fig.4.6: Distribution of PWHA except pregnant women by nutritional status and gender

Among the socio-demographic characteristics, gender/sex was the only one that was significantly associated with the nutritional status according to BMI: women (mean BMI=22.19) had a higher mean BMI than men (mean BMI=20.22) with $t=-4$ and

p=0.045; this was also confirmed by a Chi-square test with $X^2=4.3$ and p=0.045. It can be well seen on figure 4.6 as women are the only ones that are overweight.

b) To capture the nutritional status of pregnant women, MUAC for the women were taken and recorded as reflected on Figure 4.7: 11.03% of women were mildly malnourished while 88.97% had a healthy nutritional status.

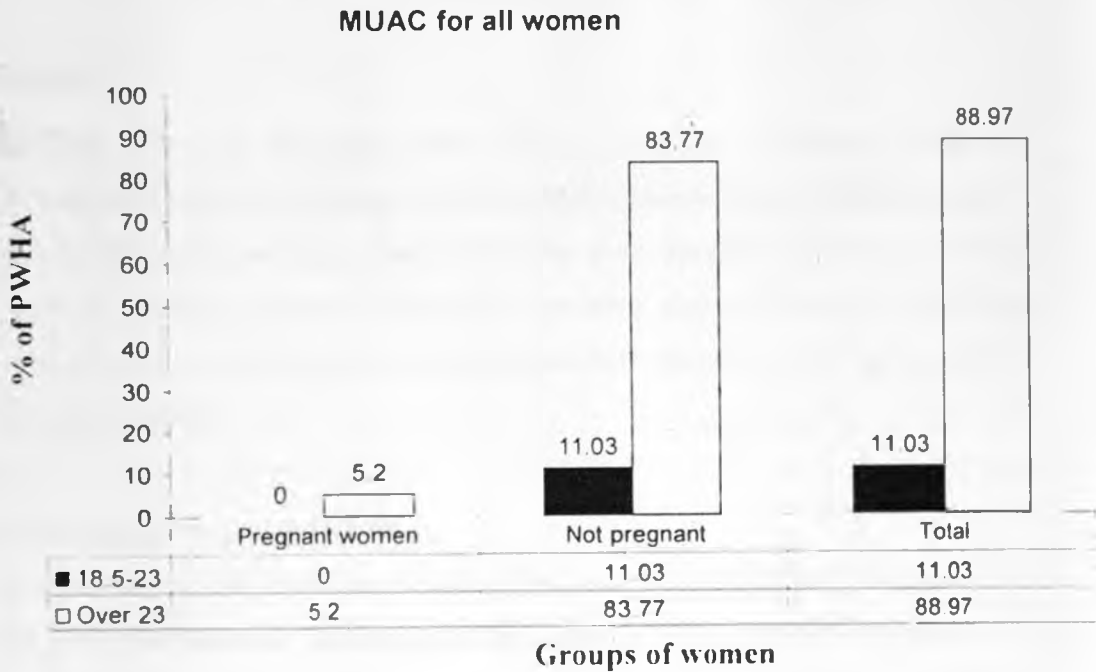


Fig. 4.7: MUAC in cm for all women

MUAC values of the respondents ranged from 19 to 31 cm, with a mean of 24.94, median of 25 and a standard deviation of 2.13. The mean MUAC between pregnant and not pregnant women were not statistically different by f test as f=0.252 and p=0.993.

4.4.6 Correlation analyses between nutritional status variables and between IDDS

1. There was a significant correlation between BMI and MUAC for all the non pregnant women ($r=0.701$ and $p=0.000$);
2. There was a negative correlation but not significant between the nutritional status and IDDS of the respondents:
 - i. BMI and IDDS of all PWHA excluding pregnant women ($r=-0.075$; $p= 0.325$)
 - ii. MUAC and IDDS of all the women ($r=-0.151$; $p=0.062$).

4.5 Discussion

The key findings of the present study have shown a situation of double burden of malnutrition and food insecurity among the respondents characterized by high levels of malnutrition (8.4% being undernourished and 8.5% over nourished) with low mean individual dietary diversity of three food groups. The study also established a statistical difference between only the gender characteristics and both the nutritional status and the individual dietary diversity.

4.5.1 Socio demographic characteristics

It has been documented that health is influenced by socio demographic characteristics, and also that socio demographic factors and dietary habits are associated (Dynesen et al. 2003). The results of the study have not shown significant difference between all the socio-demographic characteristics and both IDDS and nutritional status of the respondents: the only significant difference was found between sexes and both IDDS and nutritional status of the respondents: women had higher IDDS than men and higher BMI than men as well. The hypothesis given that there is an association between socio-demographic characteristics and both the individual dietary diversity and nutritional status of the PWHA enrolled in food and nutrition programmes of the Capacity project supported health centres is partially rejected.

This can be due to the fact that those PWHA share same background characteristics and face same conditions of life like same level of education, same kind of occupation, they

all stay in a same setting:, i.e. rural setting, among others: majority of them are subsistence farmers (93.2%); primary of education being the highest level achieved.

4.5.2 Individual dietary diversity and other related factors

The mean IDDS of the population was 3.18 and were statistically different between males and females. The composition of the diet of this population does not reflect the quality of a balanced diet. This can be explained by the following: the food groups consumed by more than 50% of the respondents were only legumes, nuts and seeds (78.6%) and white tubers and roots (58.8%). Those consumed between 30 and 50% were: dark green leafy vegetables (48.7%), oils and fats (40.6%), vitamin A rich vegetables and tubers (37.4%) and cereals (33.7%). The rest of the food groups were consumed by a number of people below 10% (vitamin A rich fruits, other vegetables, fish, other fruits, milk, flesh meats, organ meats and eggs): which can affect their lives as their bodies need a variety of foods to boost their immunity.

Even if there are no fixed cut off points of IDDS, these low consumption percentages of different food groups among this community lead to say that their IDDS is low: they are not diverse. These individuals' diets are diverse and balanced to ensure that the individual meet all the body's need by consuming sufficient nutrients to maintain energy, normalize body weight and ensure body's proper functioning. A Balanced diet is one which contains different types of foods in such quantities and proportions so that the need for calories, proteins, minerals, vitamins and other nutrients is adequately met (Srilakshmi, 2000); this population does not meet such criteria as the consumption of different food groups is low, and also quantity of food is low as it was observed many respondents who experience shortage of food in their households, those who were not satisfied with the meals of the previous day were also many; and also their number of meals were less than three for an individual whose immune system is weak. These findings are almost similar to those of the Rwanda National Agriculture Policy saying that "In Rwanda, a meal is generally made of beans and tubers and/or banana. Basic meal supplements are vegetables, oil and rarely fruits. Milk is taken by 4 to 5% of families and only 1 to 2% families regularly eat meat, fish and eggs"(Rwanda MINAGRI, 2004).

Studies done in different age groups (non breastfeeding children, adolescents and adults) have shown that an increase in IDDS is related to increased nutrient adequacy of the diet (FAO, 2007). There is now a high probability that this population diet does not meet the nutrient requirement of their bodies and this can affect their lives as their bodies need variety of foods to boost their immunity.

It has also been revealed an association between the individual dietary diversity score and food related factors: times of experiencing food shortages in the households, the situation of the previous day's eating, total number of meals of PWHA involved in the programmes; which is logically true because as it was found that those respondents who reported to experience food shortages in their households had lower IDDS than those who never experience it; the same case for those who were not satisfied with their food had lower IDDS. This can be explained by the fact that if there is dissatisfaction after eating, this is an indicator of food shortage and also it is difficult for such person to diversify the diet and even more, to meet the nutrient requirements of his/her body. This also will affect the number of meals to be taken per day by the same individuals. That is why these characteristics had shown associations with the IDDS.

Based on the above, the majority of respondents had low IDDS among others; this being an indicator of food insecurity and of low socio-economic status. This has been proven by studies that have shown that an increase in dietary diversity is associated with socio-economic status and house hold food security (Hoddinot & Yohannes, 2002; Hatloy et al., 2000)¹.

4.5.3 Nutritional status of the respondents

From the results, when pregnant women are not considered, 8.4% is underweight/wasted (BMI<18.5), 83.1% has a healthy weight (18.5≤BMI≤25) and 8.5% are overweight

¹ Guidelines for Measuring Household and Individual Dietary Diversity, version 2 by FAO and FANTA, June 2007

(BMI \geq 25). When pregnant women are considered, 11% of all women are mildly malnourished (MUAC $<$ 23cm).

In addition to the burden of HIV/AIDS, this population suffers from the double burden of malnutrition: under and over nutrition; when considering the BMI's classification. These data are not very different from those found in the Rwanda National Nutrition Policy that the rates of under nutrition and over nutrition among women between 15 and 49 years were respectively 9.4% and 9.9% in rural areas (Rwanda MOH, 2006). From the present results, the overweight respondents (8.5%) were found to be only women; which correlate together with the tests of equality of means that shown that the mean BMI were higher among women than in men. It is also known that both underweight and overweight are seen in African women, and among adults in many countries of the developing world (ACC/SCN, 2000). This exposes them to mortality: International standards classify a population with wasting of 5 to 9.9% as having a risk of 1 to 1.9 Crude Mortality Rates per 10,000 per day. Their nutritional status falls in the category of poor or medium nutritional status (FANTA, 2004). In addition to that, the overweight situation increases risk of co morbidities (Gibson, 2005) that lead to developing health problems such as type II diabetes mellitus, cardiovascular diseases (stroke and hypertension), gall bladder disease, some types of cancers, respiratory illness and reproductive problems (Gibney et al., 2004). These are warning signs that this population's health is at risk as malnutrition leads to immune impairment, worsens the effects of HIV and contributes to a more rapid progression of the disease (FANTA, 2004) and there is a call for action to overcome this problem: education being one of them.

The findings also have shown a positive and significant correlation between BMI and MUAC for the women who were not pregnant; this being true as the two indicators are sought to reflect the same nutritional status among a same individual.

The study was also sought to test the hypothesis that "there is a positive relationship between the nutritional status of the PWHA and their individual dietary diversity score". Statistical analyses showed a negative correlation but which was not significant. This

might have been due: first, to the generalized low IDDS observed among the whole respondents' population while their BMI were varying and second, to the fact that nutritional status reflected by height-weight measures reflect variability in physical activity levels as well as dietary intake/habits and only reflect long-term energy balances (Gibney et al., 2005). This come to confirm Gibson that a single day 24hour recall is not enough to adequately represent the habitual intake of an individual (Gibson, 2005) and thus to be related to the nutritional status of the population.

4.6 Conclusions

From the findings of this study, the following conclusions can be drawn:

1. Socio-demographic characteristics have less influence on the dietary diversity and nutritional status of the PWHA in Capacity project supported health centres except their gender characteristics;
2. The diet of this population is not diverse and it is deficient; mainly in vitamins and minerals: their IDDS is low which is explained by low percentages of people consuming food groups rich in those micronutrients: diet mainly composed of legumes and white tubers with low quantities of vegetables, fruits and animal products;
3. This population is food insecure: this is reflected by the fact that the majority of the respondents were not satisfied after their meals on the previous day of interview (63.2%), many people who experience food shortages in a month (79.2%), few meals per day and also the low mean IDDS (3 food groups). This also brings to conclude that they belong to a low socio-economic class.
4. This population suffer from the double burden of malnutrition: under and over nutrition: these being risk factors of morbidity and mortality. This situation results in weakening of the immune system; thus increasing the risk of opportunistic infections of PWHA. In other words, this population's health is at risk: malnutrition (under and over nutrition), food insecurity, in addition to HIV/AIDS.

4.7 Recommendations

Maintaining adequate nutrition status means consuming a variety and adequate quantity of foods to meet the energy, protein and micronutrients needs; this being applicable to every body but specifically to PWHA due to the fact that their immune system is weakened. A nutritious diet can help maintain the proper functioning of the immune system and provides needed energy, proteins and micronutrients during all stages of disease to maintain a normal body weight and prevent co-infections.

From the findings of the study, it is recommended that PWHA in the Capacity project supported health centres get adequate food and nutritional support and care in order to improve their food security and nutrition status by:

1. Emphasizing on nutrition education of PWHA based on the nutritional status, stage of disease and/or the type of medication that is being given:
2. Provision of food aid to PWHA who are food insecure and/or weak based on fixed entry and exit criteria:
3. Initiation of productive income generating activities that aim to increase food access and/or production to protect livelihood, improve food security and nutritional status. This can be done through initiating activities like improved farming, livestock keeping, small scale business activities: skill development programmes with the aim of ensure sustainability of the program and reducing dependence among the population.

4.8 References

1. ACC/SCN (2000). Fourth report on the World Nutrition Situation. Geneva: ACC/SCN in collaboration with IFPRI. Pv; 17-19.
2. Dynesen A.W, Haraldsdo J., Holm L. and Astrup A. (2003). Socio-demographic differences in dietary habits described by Food Frequency questions results from Denmark. In: European Journal of Clinical Nutrition. P1. Downloaded on 8th August 2008 from www.nature.com/ejcn
3. FANTA, AED (2004). HIV/AIDS: A Guide for Nutritional Care and Support. 2nd Edition. Washington DC, USA. P13-19.
4. FAO (2007). Guidelines for Measuring Household and Individual Dietary Diversity. Version 2. (Prepared by FAO Nutrition and Consumer Protection Division with support from EC/FAO Food Security Information for Action Programme and the Food and Nutrition Technical Assistance (FANTA) Project. Rome, Italy. P1-17.
5. Fisher A.A, Laing J.E., Stoeckel J.E. and Townsend J.W. (1991). Handbook for Family Planning Operations Research Design. 2nd Edition. The population council, New York, USA. P45.
6. Gibney M. J., Macdonald I. A. and Roche H.M. (2004). Nutrition and Metabolism. 1st Edition. Blackwell Science, Great Britain. P332.
7. Gibney M. J., Margetts B. M., Kearney J. M. and Arab L. (2005). Public Health Nutrition. Blackwell Science, Great Britain. P65.
8. Gibson R.S. (2005). Principles of Nutritional Assessment. 2nd edition. Oxford University Press. New York, USA. P 131-290.
9. Majumdar P.K. (2005). Research Methods in Social Science. Viva Books Private Limited, New Delhi, India. P170.
10. Piwoz E. G. and Preble E. A. (2000). HIV/AIDS and Nutrition: A Review of the Literature and Recommendations for Nutritional Care and Support in Sub-Saharan Africa. Washington DC. P1-10.
11. Rwanda Ministry of Agriculture and Animal Resources (2004). National Agriculture Policy. Kigali, Rwanda. P3-5.
12. Rwanda Ministry of Health (2005a). National Health Sector Policy. Kigali, Rwanda.

13. Rwanda Ministry of Health (2005b). National Guidelines for Food and Nutritional Support and Care for People with HIV/AIDS in Rwanda. Kigali, Rwanda. P1-75.
14. Rwanda Ministry of Local Government (2007). Gicumbi District Development Plan (2008-2012). Gicumbi, Rwanda. Pi.
15. Rwanda Ministry of Local Government (2007). Nyagatare District Development Plan (2008-2012). P1.
16. Rwanda Ministry of Local Government (2007). Rulindo District Development Plan (2008-2012). Rulindo, Rwanda. P7.
17. Rwanda National Institute of statistics and ORC Macro (2006). Rwanda Demographic and Health Survey 2005. Calverton, Maryland, USA. P232.
18. USAID, FANTA, AED (2006). Categories of Nutrition/Mortality Situation. www.fantaproject.org. Email: fanta@aed.org

CHAPTER FIVE

General Recommendations

The following recommendations were given to contribute towards improvement of utilization of national guidelines for food, nutritional support and care for PWHA; which will directly improve the food and nutrition situations of the targeted PWHA and improvement of food and nutritional situations of PWHA in health centres supported by the Capacity project:

i. Recommendations given to the Capacity project and other providers involved in the food and nutrition programmes of PWHA:

1. Increase the training of the providers on the utilization/application of the guidelines:
2. Ensure that providers do a regular monitoring of the nutrition status of the PWHA by providing basic equipments which are balances, height meters as well as MUAC tapes for both adults and children:
3. Provide food aid to the PWHA who are found to be food insecure and based on the guidelines entry and exit criteria:
4. Initiate, for PWHA who are food insecure and strong, income generating activities that are productive to improve their food and nutrition status as well as reducing dependency among the population:
5. Ensure that each health centre is connected to a community based programme where to refer the moderately malnourished PWHA and for some other health related follow ups as it has been found that Community based Health Care remains the basis for so many effective health programmes.

ii. Recommendations given to the Government of Rwanda/ Ministry of Health:

1. Conduct a national evaluation of utilization of the guidelines;
2. Implement continual national training on the use of national guidelines on food and nutrition for PWHA: as well as continual national supervision of application of the Guidelines;
3. Increase and review national training of nutritionists at all levels of education: from diploma to the highest level to ensure long term improvement of health and nutritional status of the Rwandan population and of the PWHA in particular;
4. Disseminate documents of national guidelines on food and nutritional support and care for PWHA among providers and ensure that they are referred to in the food and nutrition programmes;
5. Put in place the policy to of provision of dietary supplements as they are used with the intention to supplement the diet by increasing the total daily intake and are included among therapies recommended for PWHA.

APPENDICES

Appendix 1: Questionnaire of the Health Service Provider Involved in the Food and Nutrition of PWHA.

Questionnaire Identification no.:-----

(Tick the right answers)

1. Background characteristics

01. Health Centre Name: _____

02. District Name: _____

03. Province Name: _____

04. Date of interview: day ... month.... Year....

06 Type of sector:

1. Government/ Ministry of Health: ____

2. NGO: ____

3. Missionary: ____

4. Private: ____

5. Other: _____

07. Locality of facility:

1. Rural: ____

2. Urban: ____

Name of the interviewer _____

Signature of the team leader _____

2. Information on the respondent

08. Do you have nutrition training: Yes: ____ No: ____

09. If yes, which qualification:

1. informal training (6 months and above): ____

2. Secondary level: ____

3. Post secondary level: ____

10. If no, what qualification:

1. nurse: _____
2. Social worker: _____
3. others: _____

3. Information on the awareness and utilization of Guidelines

11. Do you know the Guidelines for Food and Nutrition Support and Care of PWHA?

1. Yes: _____
2. No: _____

12. If yes, do you use them in your daily activities of Food and Nutrition Support and Care of PWHA?

1. Yes: _____
2. No: _____

13. If yes, may I see them?

1. seen: _____
2. Not seen: _____

14. Have you been trained on the use of those Guidelines?

1. Yes: _____
2. No: _____

15. In your food and nutrition assistance to PWHA, do you give nutrition counselling to your beneficiaries?

1. Yes: _____
2. No: _____

16. Do you meet your beneficiaries' caregivers to give them counselling on nutrition of their PWHA? :

1. Yes: _____
2. No: _____

17. What type of counselling do you give? :

1. Individual counselling: _____
2. Group counselling: _____
3. Individual and group counselling: _____

18. Do you do a regular monitoring of your beneficiaries nutrition status?

1. Yes: ____

2. No: ____

19. What equipment do you have for the determination/monitoring of nutrition status of your beneficiaries? : ____

20. Do you have a PMTCT program?

1. Yes: ____

2. No: ____

21. Do you provide nutrition counselling for HIV+ mothers (pregnant and lactating):

1. Yes: ____

2. No: ____

23. Do you provide food assistance/aid for food insecure pregnant and lactating mothers?

1. Yes: ____

2. No: ____

24. Do you provide artificial feeding for infants born to HIV+ mothers who are food insecure? :

1. Yes: ____

2. No: ____

25. Do you provide complementary food to children born to food insecure HIV+ mothers?

1. Yes: ____

2. No: ____

26. Do you have PWHA on ARVs?

1. Yes: ____

2. No: ____

27. If yes, do you provide food assistance/aid to those PWHA on ARVs that are food insecure?

1. Yes: ____

2. No: ____

28. If you don't provide food assistance/aid to your beneficiaries who are food insecure, what is the cause? _____

29. Do you initiate Income Generating Activities for PWHA who are food insecure and their families?

1. Yes: _____

2. No: _____

30. If you provide food assistance/aid,

How do you identify the food aid beneficiaries? : _____

What inclusion criteria do you use? : 1. _____

2. _____

3. _____

4. _____

5. None _____

What are the exit criteria? : 1. _____

2. _____

3. _____

4. _____

5. None _____

31. Do you have a community nutrition based programme where you refer your clients found to be moderately malnourished?

1. Yes _____

2. No _____

32. Do you provide dietary supplements to your beneficiaries found to have nutritional deficiencies:

1. Yes _____

2. No _____

4. Problems encountered by health providers in the utilization of the Guidelines

33. Do you have a problem in utilizing those Guidelines?

1. Yes: ____

2. No: ____

34. If yes, which ones:

1. insufficient personnel: ____

2. insufficient training of personnel/or lack of qualified personnel: ____

3. insufficient food aid: ____

4. Insufficient IGA: ____

5. others : ____

35. What are your suggestions to improve efficiency in the use of these Guidelines?

1. increase the number of qualified personnel: ____

2. increase the frequency of training: ____

3. increase food aid for PWHA: ____

4. increase IGA: ____

5. others: ____

THANK YOU

Appendix 2: Client/ PWHA Questionnaire

Questionnaire Identification No.:

1. Background Characteristics of the health centre

01. Name of the health centre: _____

02. Name of the district: _____

03. Region: _____

04. Date of interview: day ... month.... Year....

05. Type of facility:

1. Referral hospital
2. Hospital
3. Health centre

06. Type of sector:

1. Government/ Ministry of Health
2. NGO
3. Missionary
4. Private

07. Locality of facility:

1. Rural
2. Urban

2. Background Characteristics of the client

1. Age of client:

2. Sex:
1. Male
 2. Female

- 3. Marital status:**
1. single
 2. Married monogamously
 3. Married Polygamously
 4. Widowed
 5. Divorced

4. Number of dependants (including children and other dependents): _____

5. Are you the head of the household where you stay?

1. Yes
2. No

6. Occupation:

1. Farmer
2. Trader
3. Office worker
4. Casual work
5. Unemployed

7. Education level:

0. No education (cannot read or write)
1. No formal education but read and write
2. No formal education but can read
3. Primary level but not finished
4. Completed the primary school
5. Secondary level but not finished
6. Completed secondary level
7. Post secondary level

8. Religion:

1. Muslim
2. Catholic
3. Protestant
4. Jehovah Witness
5. No Religion

3. Questions on the food and nutrition situation of the client

I want to know some information on your food situation:

9. How do you get the food you eat? :

1. I work and get money to buy it
2. Agriculture production
3. Food aid
4. Casual work
5. Borrow food from neighbours

10. a. Do you ever experience food shortage in your household? :

1. Yes
2. No

10. b. If yes, how often? :

1. Always (more than 10 times in a month)
2. Rarely (once in a month)
3. Some times (2 to 10 times)

11. a. Did you take any meal yesterday? :

1. Yes
2. No

11. b. If yes, which ones? :

1. Breakfast
2. Snack between breakfast and lunch
3. Lunch
4. Snack between lunch and supper
5. Dinner

12. What would you say about the food you ate yesterday? :

1. The food was enough, I was satisfied
2. The food was not enough, I have been obliged to reduce and share with others
3. I didn't eat at all because there was no food

13. a. Do you receive food aid? : 1. Yes
2. No

13. b. If yes, do you find it enough? :
1. Yes
2. No

13. c. How do you use the food aid you receive?
1. I share it with others in the household
2. I sell it
3. Others/specify

14. a. Do you belong to the Income Generating Activities of this program: 1. Yes?
2. No

14. b. If yes, what type of activities? :
1. Farming
2. Trading
3. Just started (not yet produced, can't tell)
4. Art (hand craft)
5. Microfinance
6. Not yet started

14. c. Are they productive (i.e. can they sustain you?): 1. Yes
2. No

Appendix 3: Individual dietary diversity questionnaire

15. I want you to describe the foods (meals and snacks) that you ate yesterday during the day and night whether at home or outside the home. Start with the first food eaten in the morning. (Instructions to the interviewer: if the respondent tells any type of the mentioned food groups, write 1 and specify the corresponding food item in the YES box. If he did not take write 0.)

Question Number	Food groups	YES=1 NO=0
A.1	Cereals (bread, noodles, biscuits, cookies, or any other foods made from millet, sorghum, maize, rice, wheat or other locally available grains...)	
2	Vitamin A rich vegetables and tubers (pumpkins, carrots, squash, sweet potatoes that are yellow or orange inside, other locally available vitamin A rich vegetables)	
3	White tubers and roots (white potatoes, white yams, cassava, or foods made from roots, bananas plantain, Irish potatoes, arrow roots)	
4	Dark green leafy vegetables (sweet pepper/capsicum, dark green/ leafy vegetables, including wild ones+ locally available vitamin A rich foods such as cassava leaves, etc...)	
5	Other Vegetables including wild vegetables	
6	Vitamin A rich Fruits (ripe mango, papayas + other locally available fruits)	
7	Other fruits including wild fruits	
8	Organ meat (Iron-rich): liver, heart, kidney, or other organ meats or blood based foods	
9	Flesh meats : beef, pork, lamb, goat, rabbit, wild game, chicken, duck, or other birds	
10	Eggs	
11	Fish : fresh, dried fish or shellfish	
12	Legumes, Nuts and Seeds (beans, peas, lentils, soybean, groundnuts and others foods made from these)	
13	Milk and Milk/Dairy Products (fresh milk, curd milk, yoghurt, cheese or other milk products)	
14	Oils and Fats (oil, fats or butter added to food or used for cooking)	
15	Sweets (Sugar, Honey, sweetened soda or sugary foods such as chocolates, sweets or candies....)	
16	Coffee/Tea (tea: black, green, herbal) or coffee	
A.	Did you eat anything (meal or snack) outside of the home yesterday?	
D.	Was yesterday a special day where you ate unusual food?	

4. Questions on client perceptions on the service given to them in the food and nutrition Programmes

16. For how long have you been in the Food and Nutrition Support and Care of PWHA of this facility?

1. one month
2. more than a month

17. How has this program improved your nutritional status?

1. I have increased weight
2. I still have the same weight
3. I have decreased weight

18. How has the program improved your food security status?

1. I am now able to generate some income to feed myself and my family
2. My situation does not improve, I still need assistance from this program

19. Are you thought about your nutrition in this program?

1. Yes
2. No

20. Do (es) the provider(s) ask if you have any problem in the program?

1. Yes
2. No

21. Do they visit you at home?

1. Yes
2. No

22. Do you think they understand your situation?

1. Yes
2. No

23. Do they suggest what you should do to resolve the problem?

1. Yes
2. No

24. Are you satisfied with the advice you are given to your problem?

1. Yes
2. No

25. Do you like/appreciate the way this program work:

1. Yes
2. No

26. If no, what don't you like/appreciate? :

1. the way PWHA are included and excluded in the program are not really based on the criteria
2. the health provider don't treat us with respect and dignity because we are HIV positive
3. Others : _____

27. What problems do you have in this program?

1. insufficient food assistance
2. insufficient nutrition education
3. insufficient of personnel to assist us
4. No income generating activities
5. others ____

28. Which suggestions can you give to improve the program?

1. increase food assistance
2. increase nutrition education
3. increase the number of personnel to assist us
4. increase income generating activities

5. Determination of the nutrition status of PWHA who benefit from the food and nutrition Programmmes

Instructions: men should be measured weight and height alone; women should be measured MUAC, in addition to height and weight (try to be accurate by repeating the measurement at least twice on a client).

Oedemas checked for every one.

a. Men

Height (meters): _____

Weight (kg): _____

Oedemas: Yes: _____

No: _____

b. Women:

1. Pregnant: _____

2. Lactating: _____

3. Not pregnant, nor lactating : _____

Age (years): _____

Height (meters): _____

Weight (kg): _____

MUAC (cm)/left hand: _____

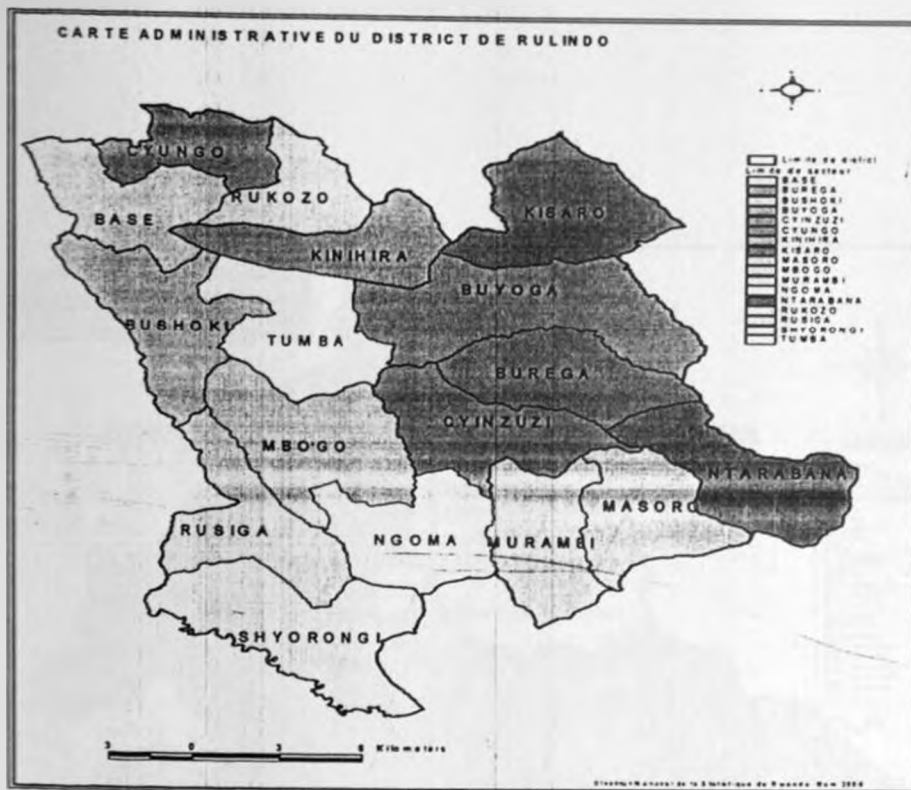
Oedemas: yes: _____

No: _____

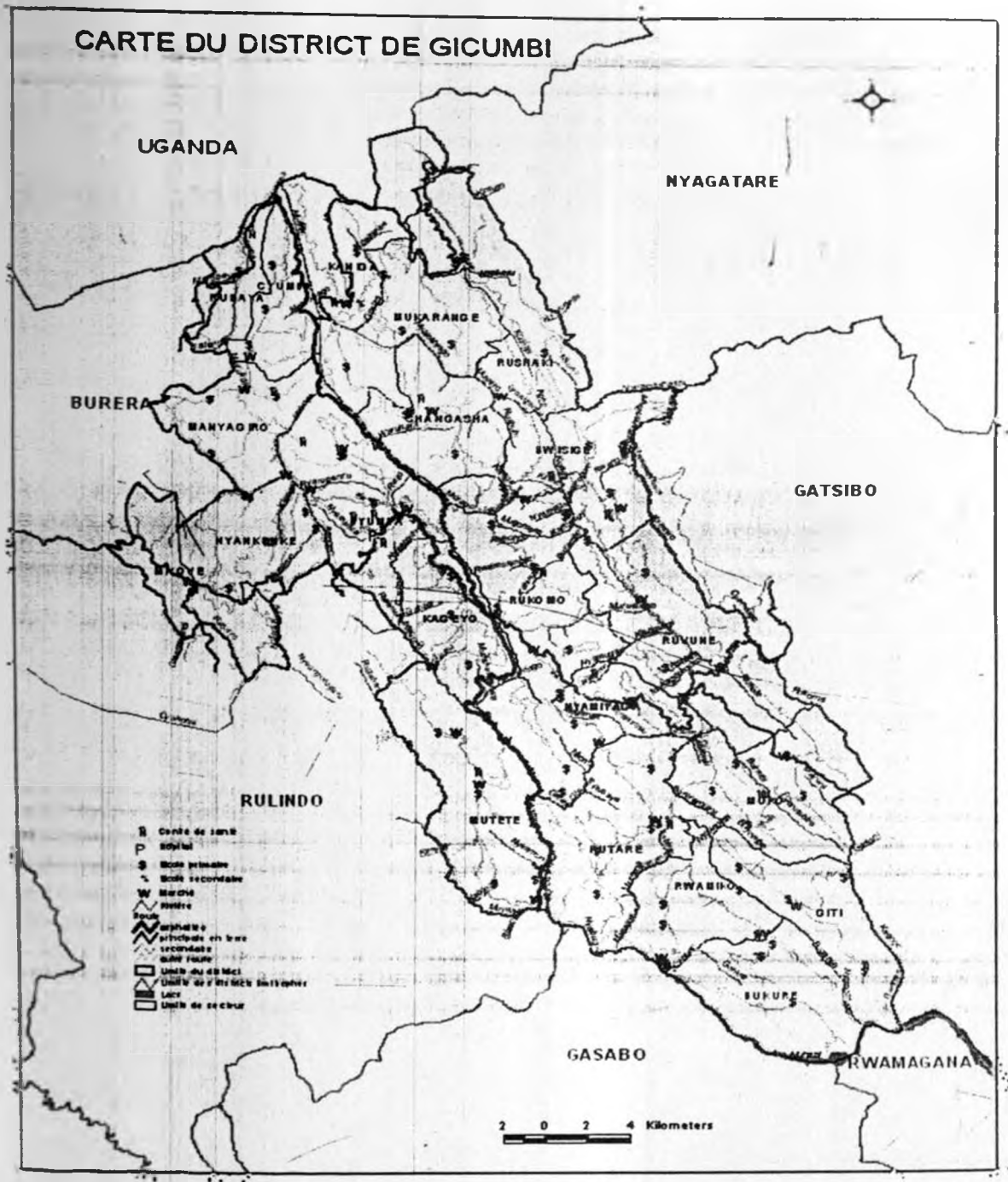
THANK YOU!

Appendix 4

Geographical Situation of the District of Rulindo



CARTE DU DISTRICT DE GICUMBI



Appendix 6

Geographical situation of the district of GICUMBI (Source: Gicumbi Development Plan)