

**PERFORMANCE OF THE NUTRITION CARE, SUPPORT AND TREATMENT PROGRAMME FOR MALNOURISHED PEOPLE WITH HIV ON ANTIRETROVIRAL THERAPY: CASE OF DOWA AND NTCHISI DISTRICTS, MALAWI //**

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**A dissertation submitted to the Board of Postgraduate Studies in partial fulfillment of the requirements for the degree of Master of Science in Applied Human Nutrition at the Department of Food Science, Nutrition and Technology in the University of Nairobi.**

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**Declaration**

I hereby declare that this dissertation is my original work and to the best of my knowledge, has not been presented for any other academic award at the University of Nairobi or any other institution. Where material has been drawn from other sources, this has been fully acknowledged.

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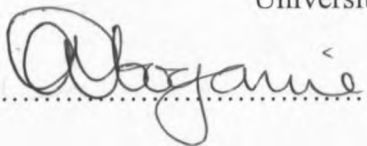
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## **Dedication**

This work is in memory of my father the late Frank Flattela Righton Geoffrey Chirwa...your departure from this world has been my motivation.

This work is also dedicated to my lovely sister and brother late Enes and late Albert Chirwa who inspired me since childhood.

This academic work is also dedicated to my lovely mum, who instilled in me the spirit of hard working and for her constant prayers, support, encouragement and believing in me. With this...we succeed than we can ever imagine.

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## Acronyms and Abbreviations

AAH	Action Against Hunger
AIDS	Acquired Immune Deficiency Syndrome
ART	Anti Retroviral Therapy
ARV	Anti-retroviral
BMI	Body Mass Index
CD4	T-Lymphocyte CD4 +
CHAM	Christian Health Association of Malawi
DHO	District Health Officer
DHMT	District Health Management Team
DNHA	Department of Nutrition, HIV and AIDS
EHP	Essential Health Package
ENA	Essential Nutrition Actions
FDG	Focus Group Discussion
HAART	Highly Active Anti Retroviral Therapy
HIV	Human Immuno-deficiency Virus
HMIS	Health Management Information System
HTA	Health Surveillance Assistant
KII	Key Informant Interview
LOS	Length of Stay
MAM	Moderate Acute Malnutrition
MDHS	Malawi Demographic and Health Survey
MICS	Multiple Indicator Cluster Survey
MoH	Ministry of Health
MUAC	Mid-Upper Arm Circumference
NCST	Nutrition Care, Support and Treatment
NGO	Non Governmental Organisation
NRU	Nutrition Rehabilitation Unit
NSO	National Statistics Office
OPC	Office of the President and Cabinet
PWHIV	People with HIV
REE	Resting Energy Expenditure
RUTF	Ready to Use Therapeutic Food
SAM	Severe Acute Malnutrition
SFP	Supplementary Feeding Programme
SPSS	Statistical Package for Social Scientists
SWAp	Sector Wide Approach programme
SWOT	Strengths, Weaknesses, Opportunities and Threats
TFFP	Therapeutic Feeding Programme
UNICEF	United Nations Children Fund
VAC	Vulnerability Assessment Committee
WFP	World Food Programme
WHO	World Health Organisation

## **Operational Definitions**

<b>Adherence</b>	Compliance of the clients to prescribed daily ration of Ready to Use Therapeutic Food (RUTF), measured by asking the clients how much of the daily prescription (ration) they consume.
<b>Adult</b>	A person who has reached the age of eighteen years or beyond
<b>Anthropometry</b>	The study of human body measurements, which assist in classification of malnutrition among of the clients
<b>Asymptomatic</b>	A condition where a person is infected with HIV but does not show any clinical signs and symptoms
<b>Acute malnutrition</b>	A condition in the body brought about by short term inadequacy of diet and diseases resulting in an individual having a low weight for his/her height
<b>BMI</b>	Body Mass Index, an indicator of wasting and/or overweight in adults computed by dividing an individual's weight in kilograms by the square of his/her height in metres
<b>Client</b>	HIV positive adult receiving Antiretroviral drugs, meeting the admission criteria and has been enrolled in the Nutrition Care, Support and Treatment (NCST) programme
<b>Cured rate<sup>ψ</sup></b>	Number of clients successfully treated and discharged divided by total number of exits (discharges)
<b>Discharge (Exit)</b>	Exiting of a beneficiary from Nutrition Care, Support and Treatment (NCST) programme upon meeting certain specified criteria
<b>Food by prescription</b>	A supplementary feeding programme that provides therapeutic fortified foods for malnourished PWHIV
<b>Nutrition care &amp; support</b>	Nutrition education and counseling on "good nutrition" and dietary management of medical conditions offered to clients

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<sup>ψ</sup> These are not « rates » in the sense of the number of events occurring in a set period of time, although the reporting period is standardized to one month. Rather they are proportions or percentages over that period. However, the term « rate » is retained because it has traditionally been used in this context, although it is an incorrect usage

<b>nutrition knowledge</b>	Awareness of nutrition information and skills gained through nutrition education and counseling on “good nutrition” and dietary management of medical conditions offered by health workers.
<b>nutrition treatment</b>	Ready to Use Therapeutic Food (RUTF) distributed to the clients as treatment of malnutrition according to severity
<b>nutritional status</b>	A measurement of the extent to which an individual’s physiological needs for nutrients are being met
<b>proportion of exits</b>	Number of exits in specific category (cured, defaulter or deaths) divided by the total number of exists (multiplied by a 100 to get %).
<b>symptomatic</b>	A condition where a person who is infected with HIV and is showing clinical signs and symptoms
<b>perceptions</b>	Ways in which clients, communities, guardians and health workers regard, understand, or interpret the way services are being provided, including strength, weaknesses, opportunities and threats, measured by asking questions during Focus Group Discussions and SWOT analysis
<b>protocol</b>	The accepted code of procedures or rules or instructions governing course of nutrition treatment. In this study, adherence to protocol (prescription) is looked at in terms of consumption of 6 or 3 sachets (providing 500 kcal and weighing 92g each) per day
<b>Weight gain</b>	Increase in weight (in grams) or amount of weight gained while in NCST programme, obtained by subtracting minimum weight from the weight observed at the time of the study

## **Abstract**

In spite of financial, human and material resources investment in Nutrition Care, Support and Treatment programme for close to five years by the Government of Malawi and its collaborating partners, the programme had never been evaluated to gauge whether it had been implemented according to originally set objectives and targets.

This evaluative study was conducted from July 2010 to October 2010 in Dowa and Ntchisi districts in Malawi where the Nutrition Care, Support and Treatment had been implemented. The main objective of the study was to evaluate the performance of the programme in the two districts. A total of six health facilities were purposively sampled because they had implemented the programme. A total of 187 clients receiving antiretroviral therapy and nutrition care, support and treatment were randomly sampled from the six facilities using probability proportion to size approach.

The data collection tools used included a pre-tested semi-structured questionnaire, Key Informant Interview guide, Strengths, Weaknesses, Opportunities and Threats guide, Focus Group Discussion guide and a secondary data template. Analysis for quantitative data was done using Statistical Package for Social Scientist version 17, Microsoft Office EXCEL 2003 and EPI6 while qualitative data were thematically analysed. Statistical tests employed included chi-square, paired t- test, and F-test and significance in the outcomes was tested at  $p < 0.05$ .

Two thirds (66.8%) of the clients in the study sample were females. Most (44.9%) of the clients were in monogamous marriages and had some formal education. The mean age of the clients in the study was  $38.2 \pm 9.1$  while the mean household size and dependency ratio were  $5.02 \pm 2.2$  and 1.07 respectively.

The vast majority of the clients (94.1%) indicated that they usually finished consuming the entire daily prescribed ration of ready to use therapeutic food and almost all (99.5%) of the clients never missed their anti-retroviral pills. The programme therefore achieved its set target of 95% on adherence to drug protocols. On nutrition knowledge, majority of the study clients (98.9%) scored less than 50%, the expected programme target for nutrition knowledge.

Results on weight gain indicate a steady upward increase over time. The mean weight on admission was  $43.0 \pm 4.2$  kg and by 8<sup>th</sup> week, it had significantly increased to  $45.9 \pm 4.2$  kg ( $t=293.32$ ,  $p=0.000$ ). Compared with the programme targets, the mean lengths of stay were well below the set standards of 90 days and 120 days for moderate and severe, which were  $64 \pm 8.6$  and  $84 \pm 6.9$  days respectively. For the discharges, the percentage for cured (49.4%) was below while that for defaulters (37.6%) was above the expected sphere standards, which are 75% and 15% respectively. The percentage of deaths (5%) performed within the sphere standards (10%).

The majority of the clients (54%) experienced an ailment in the previous one month, however, there was no significant difference in the proportions of those who experienced and those who did not experience ailments ( $\chi^2 = 1.81$ ,  $p=0.1788$ ).

While the programme was positively perceived by different stakeholders and implementers at different levels, there were hiccups observed that need to be addressed. These included inadequate trained personnel, stock out of food supplements and lack of stationery

This study concludes that the programme is achieving its targets on adherence of both nutrition and drug treatment protocols, length of stay and weight gain. However, the programme is not achieving its targets with regards to clients' nutrition knowledge and discharge rates. Nevertheless, the programme is positively perceived by stakeholders albeit with some hiccups.

It is hence recommended that nutrition education be improved through deployment of qualified personnel and distribution of take home messages to the clients; engagement of the network of volunteers available in Community based Management of Acute Malnutrition programme to help curb high percentage of defaulters; adoption of participatory monitoring and evaluation and Integrated Supportive Supervision; and investigation into the mean length of stay.



## **CHAPTER ONE: INTRODUCTION**

### **1.1 Background**

Human Immunodeficiency Virus (HIV) and Acquired Immuno Deficiency Syndrome (AIDS) are world wide public health problems which have caused devastating impact especially in the Sub Saharan region today. HIV directly or indirectly affects the health of large numbers of people in society. The pandemic has contributed to reduction in the overall health status and well being as well as the level of productivity of adults and survival, growth and development among children (Ndolo et al, 2006). It has contributed greatly to increased morbidity and mortality rates across all categories of people. The problem of malnutrition has been compounded by high burden of disease including HIV and AIDS. The pandemic has contributed to household food insecurity.

#### **1.1.1 Nutrition, HIV and AIDS in Malawi**

Malawi, just like many other countries in Sub-Sahara Africa has been seriously affected by the HIV and AIDS pandemic. Currently, Malawi is among the countries with the highest HIV/AIDS prevalence in the world. In fact, HIV/AIDS prevalence in the population aged 15-49 years is estimated at 11.8% [National Statistics Office (NSO), 2005].

The pandemic has had significant adverse effect on the health and nutrition indicators among the various categories of the population. HIV and AIDS have contributed to a rise in morbidity and mortality among various population groups. The high level of HIV and AIDS related mortality has reduced life expectancy at birth. In the absence of HIV/AIDS, life expectancy was estimated at 54 years [National AIDS Commission (NAC), 2003].

With the presence of HIV/AIDS life expectancy declined to 39 years [Malawi Business Coalition Against HIV/AIDS (MBCA), 2010].

All this happens under conditions already compounded by high prevalence of malnutrition. Malawi Government (2009) estimated the prevalence of chronic malnutrition among the under five children in Malawi at 35.8%, wasting at 1.3% while underweight was 14%. The study also reported that on the overall about 4.6% of non pregnant women of childbearing age (15-49 years) in Malawi had chronic energy deficiency. These were women whose body mass index (BMI) was below 18.5.

Micronutrient deficiency disorders are also common in Malawi. According to Malawi Government (2009) prevalence of mild vitamin A deficiency (0.7-1.05mmol/L) among under fives, school going age, women and men was 40.1%, 29.9%, 3.1% and 0.4% respectively. The study also reported that prevalence of anemia among under fives, school going age, women and men was 51.7.1%, 23.1%, 46.5% and 7.1% respectively. In addition, the study reported that 11% of school aged children while 13.8% of women had urinary iodine levels <50mg/L.

The major immediate causes of malnutrition in Malawi are disease and low dietary intake of various food nutrients that the body needs. Malawi has had frequent episodes of disease out breaks and the HIV and AIDS pandemic, which have compounded malnutrition. HIV infection and other related infections and conditions increase nutritional requirements especially for energy. Meeting the increased energy and other nutritional demands for People with HIV (PWHIV) poses a big challenge due to many factors that cause reduced food intake and poor absorption of the nutrients in the body. In

turn, poor nutrition increases the risk of morbidity and mortality among PWHIV, patients with HIV related infections such as tuberculosis (TB) and chronic illness. It compromises the quality of life and is likely to lead to fast progression of HIV to AIDS (Piwoz and Preble, 2000).

In general, households affected by HIV and AIDS have increased health care costs and therefore less money is allocated for food. This leads to low availability and accessibility to a diversity of nutritious foods coupled with high burden of diseases and an overstretched health care system. All these pose a big challenge in sustaining the quality and duration of life among those infected and affected by HIV and AIDS. In fact, a study conducted by NAC (2003) revealed that almost 100,000 HIV infected persons in the country were severely malnourished while 2 in 5 malnourished children in paediatric wards were HIV infected and 1 in 3 severely malnourished children in Nutrition Rehabilitation Units (NRUs) were HIV positive.

Another study conducted by Action Against Hunger (AAH) (2006) revealed that 17% of PWHIV who were initiated on antiretroviral therapy every year were malnourished. Prevalence of severe and moderate acute malnutrition among antiretroviral (ART) clients was 11% and 6% respectively (AAH, 2006).

### **1.1.2 Response to malnutrition, HIV and AIDS in Malawi**

Realizing the adverse impact that the pandemic has already caused among the infected persons, the affected families and communities, the public and private sector, the Malawi government in collaboration with development and NGO partners initiated several programmes for mitigating the negative impact of HIV and AIDS based on the National

HIV and AIDS policy and the National HIV and AIDS Strategic Framework. The National Strategic Framework specifies priority areas for action which include provision of equitable treatment for PWHIV and mitigation of the adverse impact of HIV and AIDS on the infected and affected populations, families and communities.

According to MoH and NAC, treatment, care and support to PWHIV in the country include provision of antiretroviral therapy (ART), prophylaxis, diagnosis and treatment of HIV related infections and conditions, testing and counseling for HIV, social, spiritual and psychological support and family or community based care among others (Ndolo et al, 2006).

The Malawi government in collaboration with various partners has been implementing several interventions for prevention, control and treatment of malnutrition among various vulnerable groups for a long time. Some of the interventions include: Management of acute malnutrition through supplementary feeding and therapeutic treatment; Interventions to address food insecurity, which include distribution of direct food transfers to vulnerable groups, food for assets, Targeted Input Programme (TIP) under safety nets and interventions for promotion of food production, access and utilization (Ndolo et al, 2006).

#### **1.1.2.1 Nutrition Care, Support and Treatment (NCST) Programme in Malawi**

The Nutrition Care, Support and Treatment programme (NCST) in Malawi was designed following recognition of prevalence of malnutrition and mortality among adolescent and adult clients registered on Anti-Retroviral Therapy (ART) in 2003. The programme was piloted in the country in 2005 in six health institutions, namely Chitipa, Rumphi, Dowa,

Zomba, St Luke's and Chikwawa. In 2006, the programme was scaled up to as many as 60 other sites providing ARVs in the county. By the end of 2007, there were over 101 sites implementing NCST. Currently, there are 222 sites providing NCST in the country.

#### **1.1.2.2 Goal and Objectives of NCST Programme**

The goal of the programme is to contribute towards reduction in malnutrition related morbidity and mortality among PWHIV enrolled on ART therapy and increase adherence to ARV therapy. The specific objectives of the programme are: to provide treatment for moderately and severely malnourished PWHIV who are on ART; to provide necessary knowledge, skills and support to clients and their caregivers for effective nutrition management of infections, conditions and drug side effects and promote adoption of essential nutrition actions for improving nutritional status and quality of life amongst the clients (MoH, 2005).

The programme provides nutrition education and counselling on nutrition management of food-drug interactions and drug side effects and treatment of moderate and severe malnutrition. This programme is integrated in the ART services and targets all PWHIV who are on ART. The programme provides food by prescription to those clients that are moderately and severely malnourished. The nutritional content of the food, which is ready to use (RUTF), has been included as Appendix 6.

Clients are admitted in to the programme based on anthropometric indices that are derived from their height and weight measurements. Most commonly used indices are Body Mass Index (BMI), Weight for Height percentage. Mid Upper Arm Circumference (MUAC) and presence of bilateral pitting oedema are also used for admission. The clients

are discharged from the programme based on the same indicators. They can also be discharged upon request. Deaths, defaulters and transfers are also referred to as discharges. Details on admission and discharge criteria for the clients are shown in Appendix 4.

## **1.2 Problem Statement**

In spite of financial, human and material resources investment in NCST programme for close to five years by the Government of Malawi and its collaborating partners, the programme had never been evaluated. In other words, no comprehensive effort was made to look at the activities and outcomes of the programme in relation to originally set objectives and targets (see Appendix 5) to gauge whether the programme has been implemented according to plan.

## **1.3 Justification**

Since inception in 2005, the programme output monitoring reports have been used to provide insights on how the programme has been ran. These reports have been able to furnish management with information on admissions, discharges and utilization.

Some reports from technical visits, coordination, review and feedback meetings, during refresher trainings and other informal consultations indicated that the programme could be experiencing a number of problems such as inadequate service utilization, violation of nutrition treatment protocols and leakage of therapeutic supplements.

The presence of these problems was a clear indication of discrepancy of ‘what ought to be’ and ‘what is’. The factors that contribute to variation and how the programme can guarantee acceptable quality level of service and outcomes needed to be explored.

Hence, this evaluative study was a valuable operations research approach for examining the achievements of programme activities. Therefore, unavailability of information regarding the way the programme was fairing underscored the need to address the knowledge gap.

## **1.4 Aim, Purpose and Objectives of the Study**

### **1.4.1 Aim of the Study**

The aim of the study was to contribute towards the improvement of Nutrition, Care Support and Treatment programme for effective prevention and management of malnutrition among PWHIV who are on ART.

### **1.4.2 Purpose of the Study**

The purpose of the study was to generate useful information on the performance of Nutrition Care, Support and Treatment for PWHIV in relation to originally set objectives, standards and expectations. This information might be useful for redesigning the programme for effective service delivery, utilisation and outcomes/outputs

### **1.4.3 General Objective**

The general objective of the study was to evaluate the performance of nutrition care, support and treatment programme among PWHIV who are on ART in Dowa and Ntchisi districts, Malawi.

#### **1.4.4 Specific Objectives**

The study was meant to achieve the following specific objectives:

- a. Determine the demographic and socio-economic characteristic of the clients.
- b. Determine association of the demographic and socio-economic characteristic of the clients with amount of ration consumed per day
- c. Determine progress in weight gain among clients who have been in NCST programme.
- d. Determine level of nutrition knowledge of the clients and compare with programme target.
- e. Determine morbidity status of the clients.
- f. Determine clients' adherence to nutrition supplements and ART/drug treatment and compare with the programme targets.
- g. Determine length of stay and trend of discharge rates for the period between July 2009 and June 2010 and compare with the programme targets.
- h. Establish the guardians', communities' and health workers' perceptions on the effectiveness and appropriateness (and Strengths, Weaknesses. Opportunities and Threats) of the NCST programme.

#### **1.5. Hypotheses and Research Questions**

##### **1.5.1. Hypotheses**

There following were the research hypotheses to be answered by the study:

- a. There is no association of demographic characteristics and socioeconomic status of the clients enrolled in NCST with amount of ration consumed per day.



- b. The level of nutrition knowledge of the clients, length of stay, drug adherence rate and discharge rates are not different from the set targets.
- c. There is no progress in weight gain among clients enrolled in the NCST programme.

### **1.5.2 Research Questions**

The research questions were as following:

- a. Are the demographic and socio-economic characteristics of clients associated with amount of ration consumed per day?
- b. Do clients have nutrition knowledge and relevant skills for managing clinical conditions?
- c. Are the clients adhering to drug treatments? To what extent are the clients experiencing nutritional and clinical conditions associated with ART and HIV?
- d. What are the Strengths, Weaknesses, Opportunities and the Threats of the programme?
- e. Is the programme achieving its set goals in relation to nutrition knowledge of the clients, adherence to treatment, length of stay and discharge rates?

### **1.6 Scope of the Study**

The study covered a population of adult, malnourished PWHIV who were on ART, their guardians, programme implementers, and the general community from which the beneficiaries hailed, that is, Dowa and Ntchisi district in Malawi.

## **1.7 Limitations of the Study**

The following were the limitations of the study:

- The study coincided with some important national events that required subjects/clients to take resulting in many 'call backs' to their households.
- The study was conducted in two districts only as such results could not be generalized for the whole region.
- On weight gain, the study did not take into consideration meals eaten from homes. It assumed that weight gain was as a result of the supplement only.

## CHAPTER TWO: LITERATURE REVIEW

### 2.1 Introduction

Human Immunodeficiency Virus (HIV) is one of the retroviruses that attacks and impairs the body's immune system, making it susceptible to many infections. HIV infects primarily vital cells in the human immune system such as helper T cells (specifically, CD4<sup>+</sup> T cells), macrophages, and dendritic cells. It replicates inside the host cells. It uses an enzyme called reverse transcriptase to convert its RNA to DNA, which is incorporated into the host cell's genetic material in the nucleus. In this way, HIV replica cells are produced (National Institute of Allergy and Infectious Diseases, 1998).

When the immune system is compromised, many microorganisms flourish making the body suffer from a number of life threatening opportunistic infections. This condition is referred to as Acquired Immunodeficiency Syndrome (AIDS). The first symptoms often include moderate and unexplained weight loss, recurring respiratory tract infections, prostatitis, skin rashes, and oral ulcerations (Wikipedia, 2010). Treatment for HIV infection consists of Highly Active Antiretroviral Therapy (HAART)<sup>31</sup>. Current HAART options are combinations consisting of at least three drugs belonging to at least two types of antiretroviral agents. Typically, these classes are two nucleoside reverse transcriptase inhibitors (NRTIs) plus either a protease inhibitor or a non-nucleoside reverse transcriptase inhibitor (NNRTI). Treatment is based on WHO (2005b) clinical staging (Table 2.1).

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<sup>31</sup> HAART neither cures the patient nor does it uniformly remove all symptoms. HAART does not work for some people. In this case new classes of drugs such as entry inhibitors provide treatment options for patients who are infected with viruses already resistant to common therapies, although they are not widely available and not typically accessible in resource-limited settings.

**Table 2.1: Clinical and Immunological Criteria for Initiating ART in Adults and Adolescents**

Clinical Stage	ART
4	Treat.
3	Consider treatment: CD4, if available, can guide the urgency with which ART should be started.
1 or 2	Only if CD4 <200/mm <sup>3</sup> .

Source: WHO (2005b)

As the ARVs became increasingly available in the poorest parts of the world in the year 2000, Sub-Sahara inclusive, critical questions that emerged were about how well the drugs would work in people who are short of food and how best would clients manage ARV side effects such as nausea, vomiting, loss of taste, just to mention but a few. Other concerns were on general weight loss and wasting associated with HIV infection. Based on recommendations from studies, nutrition components were integrated in the ART scale up plan in order to improve the quality of life of HIV and AIDS patients on ARV therapy. This was going to be achieved through improved ART efficacy, effective nutrition management of food drug interactions and side effects and through improved compliance to treatment (MoH, 2006).

## 2.2 Nutrition and HIV

Guthrie (1989) defines nutrition as a science of food, the nutrients and other substances therein, their actions, interaction, and balance in relation to health and disease and the processes by which the organism ingests, digest, absorbs transports utilizes, and excrete the food substances. The nutrients in food are responsible for human growth, repair and maintenance of body tissues. This is why nutrition can not be divorced from HIV and AIDS management because it prolongs the duration of time between HIV infection and

onset of opportunistic infections. In fact, the amount of time it takes for a person to develop in to full-blown AIDS depends on general health and nutrition status. Thus, proper nutrition is essential for delaying progression from HIV to AIDS.

HIV and malnutrition are intimately linked as both have consequences that lead to immune suppression. HIV progressively damages the immune system, which makes an individual susceptible to a number of opportunistic infections leading to loss of weight, fever, diarrhoea and many other illnesses. Undernutrition per se increases susceptibility to the infection (Hsu et al 2005). HIV compromises nutritional status, and poor nutrition further weakens the immune system, increasing susceptibility to opportunistic infections [Commonwealth Regional Health Community Secretariat (CRHCS) and the SARA Project, 2001]. Thus, clients who can not meet their nutrition requirements are likely to experience opportunistic infections because their immune system is rather compromised. Hence, meeting nutrition requirement for PWHIV is an important.

### **2.2.1 Nutrient Requirements for PWHIV**

Nutrient requirements for PWHIV are based on the WHO Technical Consultation on Nutrient Requirements for People Living with HIV/AIDS that took place in Geneva, Switzerland in 2003 (WHO, 2003a).

Studies point to low energy intake combined with increased energy demands due to HIV infection and related infections as the major driving forces behind HIV-related weight loss and wasting. Based on increased resting energy expenditure (REE) observed in studies of HIV-infected adults, it is recommended that energy be increased by 10% over accepted levels for otherwise healthy people (WHO, 2003a). Increased energy intake of

about 20% to 30% (Table 2.2) is recommended for adults during periods of symptomatic disease or opportunistic infection to maintain body weight. This takes into account the increase in REE with HIV-related infections. However, such intakes may not be achievable during periods of acute infection or illness, and it has not been proven that such high intake levels can be safely achieved during such periods. Moreover, it is recognized that physical activity may be reduced during HIV-related infections and the recommended increased intake is based on the energy needed to support weight recovery during and after HIV related illnesses. Intakes should therefore be increased to the extent possible during the recovery phase, aiming for the maximum achievable up to 30% above normal intake during the acute phase (WHO, 2003a).

According to WHO (2003a) there are insufficient data at present to support an increase in protein intake for PWHIV above normal requirements for health, that is, 12% to 15% of total energy intake. Similarly for fats, there is no evidence that total fat needs are increased beyond normal requirements as a consequence of HIV infection.

**Table 2.2:    Macronutrients and Energy Needs for PWHIV**

- Energy requirements are likely to increase by 10% to maintain body weight and physical activity in asymptomatic HIV-infected adults, and growth in asymptomatic children.
- During symptomatic HIV, and subsequently during AIDS, energy requirements increase by approximately 20% to 30% to maintain adult body weight.
- Energy intakes need to be increased by 50% to 100% over normal requirements in children experiencing weight loss.

Source: WHO (2003a)

Micronutrient deficiencies are prevalent in many HIV-infected populations, and numerous studies have reported that these deficiencies impair immune responses, weaken

epithelial integrity, and are associated with accelerated HIV disease progression<sup>3</sup>. According to (WHO, 2003a) some studies show evidence that supplements of, for example, B-complex vitamins, and vitamins C and E, can improve immune status, prevent childhood diarrhoea and enhance pregnancy outcomes, including better maternal prenatal weight gain and a reduction of fetal death, pre-term birth and low birth weight. The effect of these micronutrients on HIV disease progression and mortality is under study.

HIV-infected adults should consume diets that ensure micronutrient intakes at RDA levels. However, this may not be sufficient to correct their nutritional deficiencies in HIV infected individuals.

Results from several studies raise concerns that some micronutrient supplements such as vitamin A, zinc and iron, can produce adverse outcomes in HIV infected populations. Safe upper limits for daily micronutrient intakes for PWHIV still need to be established (WHO, 2003a).

## **2.3 Antiretroviral Therapy and Nutrition as Interventions for Improving Quality of Life**

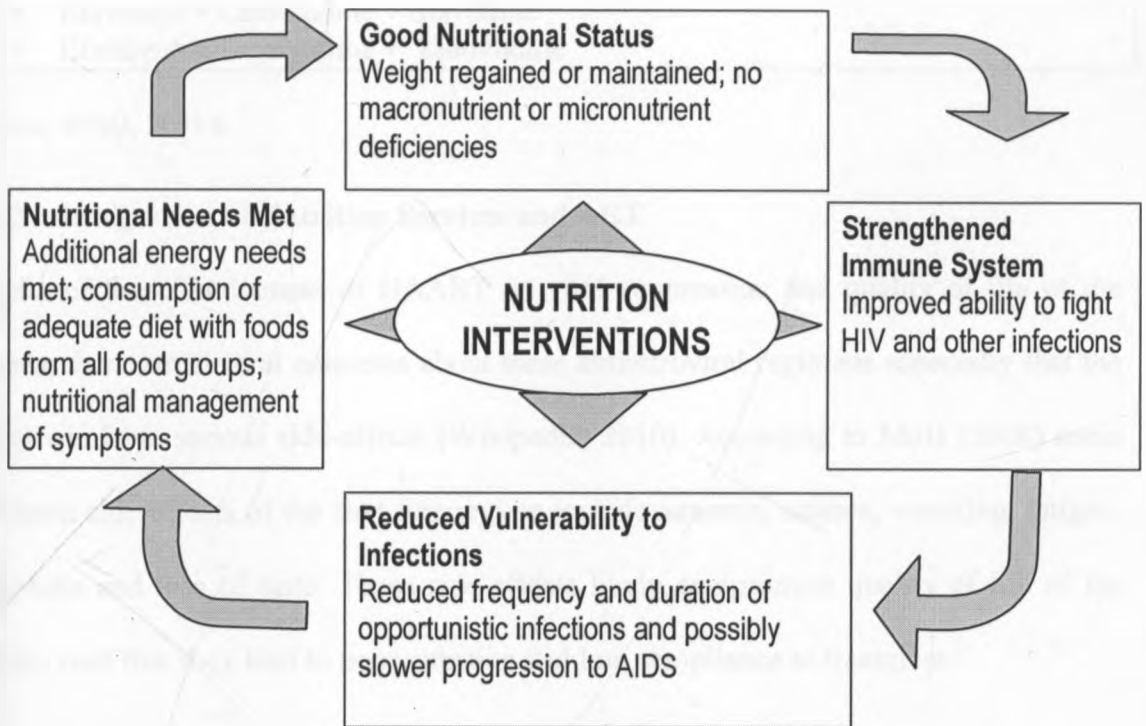
### **2.3.1 Nutrition Treatment, Counseling and Education**

HIV infection results in complicated nutritional issues for patients. There is growing evidence that nutritional interventions influence health outcomes in HIV-infected patients. Currently, “good nutrition” is increasingly being recognized as a fundamental ingredient for promoting the health of PWHIV. Translating good nutrition into an

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<sup>3</sup> [http://www.lighthousepharma.com/hiv\\_info/micronutrientshiv.htm](http://www.lighthousepharma.com/hiv_info/micronutrientshiv.htm), accessed 9<sup>th</sup> April 2010, 1.51pm

appropriate, balanced, nutritious diet for the infected individuals is a positive way to respond to this condition and the illnesses associated with it. According to WHO (2005a) there is evidence that this helps the infected and the ill individuals lead better, longer and more comfortable lives. Figure 2.1 below shows the cycle of benefits from nutrition interventions.



Source: Piwoz and Preble (2000).

**Figure 2.1: HIV and Nutrition: The Cycle of Benefits from Nutrition Interventions**

### 2.3.2 Antiretroviral Therapy

HAART prevents viral replication by inhibiting certain cell activities or by preventing entry of the virus to the concerned cells (Wikipedia, 2010), thus, slowing down progression to AIDS. Current HAART options are combinations consisting of at least three drugs belonging to at least two types, which are often given based on resistance.



WHO (2003b) recommends the following HAART combinations for adults and adolescents in Sub Sahara and other resource limited settings as in table 2.3 below:

**Table 2.3 Recommended HAART Combinations for Adults and Adolescents in Sub Sahara Africa**

- Nevirapine + Lamivudine + Stavudine
- Nevirapine + Lamivudine + Zidovudine
- Efavirenz + Lamivudine + Stavudine
- Efavirenz + Lamivudine + Zidovudine

Source: WHO, 2003 b

### **2.3.3 Integration of Nutrition Services and ART**

Inspite of the effectiveness of HAART on viral suppression and quality of life of the clients, there are several concerns about these antiretroviral regimens especially that the drugs can have serious side-effects (Wikipedia, 2010). According to MoH (2008) some common side effects of the first line regime include anaemia, nausea, vomiting, fatigue, headache and loss of taste. These side effects likely compromise quality of life of the clients such that they lead to poor nutrition and low compliance to treatment.

Food and Nutrition Technical Assistance (2004) recommends “good nutrition” to deal with ART side effects. Balanced diets, clean and safe drinking water are said to be effective in management of ARV side effects. Nutrition Education and Counseling and food supplements are also used for rehabilitation and reversing wasting (malnutrition) and weight loss. Mostly, moderately and severely malnourished clients are given rations of ready to use therapeutic food or corn soy blend (CSB). The nutrition status of the clients is assessed every time they come for more ration to determine improvement.

## **Case Studies of Food Supplementation and Nutrition Counseling (Education)**

Muhomah (2008) investigating the influence of food supplementation (and nutrition counseling) on the nutritional status and body composition of malnourished HIV/AIDS adults on ART, using a longitudinal randomized block design reported significant improvement of nutritional status of the food supplement and nutrition counseling group ( $p < 0.05$ , BMI 16.7 to 18.7). In her two arm-randomized clinical study on evaluation of the role of supplementary food in reversing malnutrition among HIV positive adults receiving ARVs, Okumu (2009) observed that food supplementation and nutritional counseling significantly improved anthropometric status, morbidity experiences and dietary intake of the PWHIV who were on ART.

### **Case of Dowa and Ntchisi in Malawi**

A longitudinal study commissioned by MoH in 2005 indicated that nutrition supplementation, education and counseling improved the nutrition status as well as quality of life of PWHIV who were on ARV therapy (AAH, 2006). In this pilot study, new and existing HIV patients taking ARVs were given RUTF<sup>1</sup> (see Appendix 6). Their nutrition status and health status were monitored very closely. This study was very useful for the scale up of integrated management of malnutrition and HIV in Malawi. However, there were a few limitations with the study design that was employed. Inclusion of subjects in the study was not based on any form of conventional sampling method. In fact, a number of clients were included in the study because “it was unethical not to give them the food supplement”. It was also observed that the study did not employ any complementary method of data collection.

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<sup>1</sup> RUTF is a food supplement popularly known as plumpy nut. It is made from peanut paste to which other nutrients are added. The nutrient content has been attached as Appendix 3.

After the pilot study, AAH handed over the programme to Ministry of Health. Unfortunately, the Ministry did not have enough capacity to technically support the implementation of the programme. Supervisory visits to the implementing sites reduced. In view of this, most service providers stopped sending monthly reports to the central level. Data tracking was almost impossible because of lack of capacity of the Ministry. The central level was then left in an awkward position because there was inadequate data to justify and back performance of the programme. National, district and facility level data were not available in most cases. It is for this reason that this study did not include much material about the NCST programme.

#### **2.4 Knowledge Gap**

The NCST programme was introduced in Dowa and Ntchisi in 2005. The goal of the programme was to reduce mortality and morbidity by achieving improved nutritional status and quality of life of PWHIV and ART clients, and delayed HIV progression to AIDS through food by prescription, health and nutrition education and counseling.

Since inception, the programme monitoring reports were used to provide a picture of how the programme was ran. However no thorough effort was taken to look at the activities and outcomes of the programme in relation to originally set objectives; whether the programme was being implemented according to plan, standards and expectations. In other words, programme activities were implemented for years but never assessed.

Thus, achievements over the five years had not been systematically investigated and documented, hence the study.

## CHAPTER THREE: STUDY SETTING AND METHODOLOGY

### 3.1 Study Setting

#### 3.1.1 Population and its Ecology

Dowa and Ntchisi are districts in the central region of Malawi. Dowa lies between 13° 35' 0" S and 34° 0' 0" E. It is situated 50km to the north east of the Capital City Lilongwe. It shares boundaries with Kasungu to the North, Ntchisi to the North East, Salima to the East and South East and Lilongwe to South and South West. It has a land area of 3,041 square kilometres.

The western and the southern parts of Dowa district are fairly flat and fertile, while the northern and the eastern parts are hilly and undulating; thus making it difficult for transportation especially during the rainy season.

Dowa has an estimated total population of around 556,678 people, of which 272,732 are males and 283,946 are females, with annual growth rate of 3.1% (National Statistics Office, 2009). Adults Population is 266,285 (129,878 males and 136,407 females). Total number of households in Dowa is 121,884, with an average household size of 4.6. Dowa has a population density of 183 persons per km<sup>2</sup>.

Like in Ntchisi, HIV/AIDS is an increasing problem in Dowa, although it remains more obvious in the few urban and more densely populated areas. Cholera and Falciparum malaria are also seasonally common with malaria being the most frequent cause of death at most health facilities. There is one 140-bed district hospital, 3 mission hospitals, 13

health centres and 2 dispensaries. Ntchisi, on the other hand has one district hospital, 2 mission hospitals and 9 health centres.

Ntchisi lies between 13° 22' S and 34° 0' 0" E and is situated 88 km to the north east of the Capital City Lilongwe. It is bordered by Dowa in the South and West, Nkhhotakota to the East and Kasungu to the North and Salima to South East. Ntchisi has an estimated size of 1655 km<sup>2</sup> and with a population of about 224, 098 (109, 349 males and 114, 749 females) [Ntchisi Health Management Information System (HMIS), 2009]. Ntchisi District health indicators are among the worst in the country. Life expectancy at birth stands at 39 years. The most commonly reported cause of morbidity in both adults and children is malaria, and both the incidence and case fatality rates appear to be rising (Ntchisi HMIS, 2009)

According to National Statistics Office (2009) Ntchisi has an annual growth rate of 3.0% and population density of 135 persons per km<sup>2</sup>. There are 47, 428 households in the district with average household size of 4.7.

Chewas is the predominant ethnic group in both districts. The Yao ethnic groups are found mainly in the major trading centres. The Chewas and Ngonis are predominantly farming communities, cultivating mainly maize and tobacco, and some cassava, sweet potato, beans and vegetables. Other economic activities include trading in agricultural products and manufacturing of cane furniture.

The road network in both districts is poor. Tarmac roads lead to the administrative parts of the districts. However, there are plenty of tracks that connect most villages that are easily traversed but frequently become impassable during the height of the rainy season.

Both districts are served with telecommunication. There are three main telecommunication service providers in the districts, namely, Zain Malawi (Airtel), Telkom Network Malawi (TNM) and Malawi Telecommunications Limited (MTL).

### **3.1.2 NCST Services for HIV Patients on ART in Dowa and Ntchisi Districts**

Nutrition Care, Support and Treatment (NCST) services for PWHIV who are on ART started in the districts in December 2005. These services for malnourished ART clients are provided through ART sites. Currently, there are 10 health facilities providing ART services in Dowa. As of 31 December 2009, a cumulative total of 8,063 clients were on ARVs in the district (MoH, 2009) and 1,371 clients were admitted in NCST programme. About 17% of the ART clients are admitted to NCST programme with acute malnutrition (AAH, 2006). Of the 10 ART sites in Dowa, only six facilities are providing NCST services, namely, Chankhungu Health Centre, Dowa District Hospital, Dzaleka Health Centre, Madisi Mission Hospital, Mponela Rural Hospital, and Mtengowanthena Community Hospital. In Ntchisi, of the 5 health facilities providing ARVs, only three health facilities are providing NCST, namely, Kangolwa, Malomo Health Centre and Ntchisi District Hospital.

Since health services are decentralized in the country, the District Health Officer (DHO), based at the district is the overall in-charge of all health services offered in the district. The DHO is also responsible for administrative issues of the health sector in the district. Mission hospitals or health facilities belonging to Christian Health Association of Malawi (CHAM) are headed mostly by nuns, who receive medical or nursing training. In-charge of health centres are usually clinical officers (clinician) or nurses.

Apart from formal trainings that the health workers receive before graduation and deployment in the health delivery system in the district, they also receive in-service training. In fact, before implementation of ART and NCST programmes, MoH in conjunction with AAH provided training to at least two technical staff (nurse and clinician) and two Health Surveillance Assistants (H.S.A.s) in the sites. These health workers were trained using nutrition and HIV integrated curriculum.

These health workers conduct HIV staging and nutrition assessment of PWHIV within ART clinic; register and admit clients based on admission criteria; and provide ART, nutrition treatment and nutrition education and counselling to clients.

### **3.2 Study Design**

The study employed two study designs. The first component of the study was cross-sectional (evaluative) study design, which was both descriptive and analytical in nature. For this cross sectional survey, a semi-structured questionnaire was administered to the clients in seven ART/NCST sites in the two districts. Additional information was collected using the qualitative methods of data collection. The other part of the study utilized retrospective-comparative study design. This component of the study gathered routine (secondary) data collected in the process of implementing the programme in the ART/NCST sites over the preceding years, which was then analysed, indicators computed and compared with set programme targets.

### **3.3 Sampling**

**Inclusion criteria:** The study included clients who were in the programme since mid May 2010, aged 18 years and above and who had consented to take part.

**Exclusion criteria:** The study excluded adolescents, pregnant women, clients with serious medical conditions and those benefiting from other nutrition programmes.

### 3.3.1 Sample Size Determination

#### a. Sample Size of PWHIV for the Cross Sectional Study Component

The study population for the cross sectional study component consisted of all adult PWHIV who were on ART and had been enrolled in NCST programme in the districts since mid May 2010. The study excluded adolescents, pregnant women, clients with serious medical conditions and those benefiting from other nutrition programmes.

In order to determine the desired sample size (*nf*) (when population is less than 10,000), the required sample size (*n*) when population is greater than 10,000 was computed since *nf* was derived from *n*. In such a case, Fischer et al (1991) recommends application of the formula  $n = \frac{z^2 pq}{d^2}$  when the population is more than 10,000. In view of this, the sample size was determined as follows:

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

$$n = \frac{(1.96)^2 (0.17) (0.83)}{(0.05)^2} = \frac{3.8416 \times 0.17 \times 0.83}{0.0025} = 216.8 = 217$$

Where

- n:** The required sample size (when population is greater than 10,000).
- Z:** The standard normal deviate which was supposed to be set at 1.96, instead 2.0 was used to simplify the calculation, which corresponds to the 95% confidence level.
- p:** Proportion of malnourished PWHIV who are on ARVs (17% or 0.17)
- q** 1.0 – *p*, which is 1.0 – 0.17 = 0.83
- d:** Degree of accuracy desired or degree of precision = 5% (or 0.05)



In order to determine the desired sample size (*nf*) when population is less than 10,000, Fischer et al (1991) recommend that the following formula be applied:

$$nf = \frac{n}{1 + \left(\frac{n}{N}\right)}$$

$$\text{Therefore, } nf = \frac{217}{1 + (217/1371)} = \frac{217}{1.15828} = 187.34 = 187$$

Where:

*nf* = the desired sample size (when population is less than 10,000).

*n* = the desired sample size, that is, when the population is more than 10,000, which is 217

*N* = the estimate of the population size, which is 1371.

#### **b. Sample Size for Focus Group Discussions**

The guardians of the clients and community members residing within the study area participated in Focus Group Discussions (FGDs). A total of five FGDs were conducted, four FGDs each with 8 to 16 people in Dowa and one in Ntchisi.

#### **c. Sample Size for the Key Informant Interviews**

The health workers, particularly those implementing the programme acted as Key informants (KIs). This involved seven Key informant interviews (KII) drawn from the pool of implementers.

#### **d. Sample Size for SWOT Analysis**

A sample of 5 respondents drawn from various implementing partners took part in Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis.

### **e. Sample Size for Retrospective Study Component**

The sample size of this study component included all the malnourished adult PWHIV who were initially enrolled and were discharged from the programme between July 2009 and June 2010.

### **3.3.2 Sampling Procedure**

#### **a. Sampling of PWHIV for the Cross Sectional Study Component**

Sampling procedure involved purposive sampling of the Dowa and Ntchisi districts among districts implementing NCST programme. A total of six facilities, four health facilities operating under Dowa District Health Office (DHO) and two facilities under Ntchisi DHO were purposively selected for logistical reasons. Sampling of the respondents was done in two steps, using the Probability Proportion to Size (PPS) followed by Simple Random Sampling. Appendix 13 shows the sampling schema (sampling overview).

#### **b. Sampling for Focus Group Discussions**

The guardians of the clients and community members who participated in FGDs were conveniently sampled with assistance from the health workers. The respondents were selected from adults aged between 18 and 49 years and residing within the study areas (Mtengowanthena, Dowa DHO, Madisi, Mponela and Ntchisi DHO).

#### **c. Sampling for the Key Informant Interviews**

KII included one nutrition officer, one homecraft worker, one clinician, one nurses, one Health Surveillance Assistant (H.S.A) and two ward clerks. These were purposively selected based on their in-depth knowledge of the programme.

#### **d. Sampling for SWOT Analysis**

This involved five respondents from managerial and policy level staff at MoH, DNHA and UNICEF. At least one of the District Health Management Team (DHMT) members and implementing cadres were among the respondents. These were purposively selected.

#### **e. Sampling for Retrospective Study Component**

The retrospective study component included records on all the malnourished adult PWHIV who were enrolled in the programme between July 2009 and June 2010.

### **3.4 Data Collection Tools and Equipment**

The study tools included a semi-structured questionnaire, Focus Group Discussions guide, Key Informant Interviews guide, SWOT analysis guide and template for retrospective data. The study also utilized equipment such as bathroom type scale for weight measurement.

### **3.5 Recruitment and Training of Research Assistants**

Since the study required people who were conversant with the culture, language spoken in the districts and also health and nutrition related procedures, health workers from the districts, other than the implementers were recruited as research assistants. There were four survey teams. Each Survey Team consisted of two interviewers (except one enumerator who had no partner). There was an overall team leader and a driver for served all the teams. A competent data clerk was also hired. All survey team members received 3 days of training on the overall survey objectives and procedures at one of the reputable conference facilities before the commencement of the study (Refer to appendix 12). Interviewers responsible for administering the questionnaires participated in role-playing

and interview exercises to ensure consistency. Those responsible for recording data were also given an opportunity to practice with the team members.

### **3.6 Pre-testing of Tools**

The data collection tools were pre-tested before the end of data collectors' training. For the questionnaire and template for retrospective (secondary) data, both were pre-tested with a total of 10 respondents at Chankhungu and Dzaleka Health Centres in Dowa District. The KI, SWOT and FGD guides were pre-tested with at least 5 people each. The data collected from the pre-testing was used to gauge validity of the data collection tools. The tools were modified based on data collected from pre-test and was not included in the final research data.

### **3.7 Data Collection Techniques and Procedures**

Both qualitative and quantitative data were collected. The data were collected using a pre-tested semi-structured questionnaire, Focus Group Discussion guide, Key Informant interview guide, SWOT analysis guide and template for retrospective data. Broadly, data that was collected included socio-demographic characteristics, socio-economic status, health and nutrition, strategies for sustaining nutrition status after discharge and recommendations for improvement.

#### **Demographic and Socio-Economic Characteristics**

This information was captured by administering a pre-tested semi-structured questionnaire (see Appendix 7). Data on socio-demographic and socio-economic characteristics that was collected included age, sex, marital status, educational level, main

occupation of the clients, monthly income, source of food, household composition and the average household size for the sampled clients .

### **Water and Sanitation**

Information on availability of safe drinking water was collected by asking the respondents the sources of their drinking water. Data on availability of sanitary facilities such as toilet, details on type and location of the toilet were also collected.

### **Morbidity Experience**

Information on morbidity experience was collected by asking the clients the frequency with which they experienced nutrition related ailment (symptoms) since they last visited the health facility. Common ailments dealt with included: nausea, vomiting, loss of taste, diarrhoea, constipation, oral thrush, anorexia or if they did not experience the conditions .

### **Adherence to Nutrition and Drug Treatments**

This information was captured by administering a questionnaire. The data that was collected included: type of therapeutic supplements the clients were receiving, the daily ration and whether they consumed the ration according to protocols. The respondents were also asked to state if they missed taking pills. This section also collected reasons for not complying with both nutrition and drug treatment.

### **Nutrition Knowledge**

This section of the questionnaire collected information on the clients' level of nutrition knowledge based on the guidelines and training manual. The clients were asked about Malawi six food groups, number of meals they take in a day, how often they take snacks

in between meals. They were also asked what dietary remedies they would take if they experienced ailments. This consisted of thirty seven (37) multiple response questions. Each correct response earned the client 1 score or mark.

### **Progress in Weight Gain**

This section collected data on clients' weight on admission, weight on two consecutive visits and on the day of the study. Admission weights were obtained from either the register or client's master card. A bathroom type scale was used to measure the weight of the clients during the survey. The scales were placed on a flat hard surface. The client was asked to stand on the scale bare footed and with light clothing. Weights were recorded immediately to the nearest 0.1 kg.

### **Perception and Recommendations**

Perceptions regarding the effectiveness and appropriateness of the programme were collected by asking the clients what they felt about the services offered by the health workers, their satisfaction with quality, taste and amount of supplements they received. That is, whether they were satisfied with what the programme offered. They were also asked to mention areas that needed improvement and how.

### **Focus Group Discussions**

FGDs were used to collect information from the guardians and communities. Participants were asked to provide their perception on how the programme was being ran. This included issues of accessibility and factors affecting utilization of the available services, management of food supplements at home, recommendations for improvement and coping strategies after discharge (refer to appendix 9).

## **SWOT Analysis**

This was used to collect information from the service providers, hospital administration, and nutrition programme planners at national level. This tool exclusively collected strengths, weaknesses, opportunities and strengths of the programme (see Appendix 10).

## **Key Informant Interviews**

The Key informant interviews were used for collecting in depth information from the service providers. The key informant interviews captured issues of project inputs and technical support, utilization of guidelines, referral of clients to other nutrition and health related services (refer to Appendix 8).

## **Secondary Retrospective Data**

Secondary data were collected from the programme registers, clients' master cards and monthly monitoring reports. These collected the numbers of clients who were discharged from the programme (as cured, deaths defaulters and length of stay) during the period between July 2009 and June 2010 (refer to Appendix 11).

## **3.8 Human Subjects and Ethics Considerations**

Before the study began, permission was sought by acquiring a letter of recognition from the university and local authorities were also informed of the study. Besides, in order to ensure that this study followed principles to prevent unethical risk to study subjects, an application was made to Malawi National Health Sciences Research Committee for approval (Appendix 16). The five principles guiding ethics in research were followed namely; scientific merit, equitable selection of subjects, seeking informed consent, confidentiality and avoidance of coercion.

Prior to collecting information from the clients, enumerators were explaining to the respondents the objectives of the study and how the findings would help the country and specifically malnourished PWHIV on ART. Where consent was granted, the respondent were asked to sign an informed consent form (refer to Appendix 14). Clients with medical conditions requiring attention were referred to appropriate health personnel or facility using a referral form. The English version of the referral form was translated to Chichewa (Refer to appendix 15). The English version was used to refer clients who could understand English, otherwise the Chichewa one was used.

### **3.9. Data Quality Control**

Apart from pre-testing both English and Chichewa versions of the questionnaires and other data collection tools and modifying them according to the feedback obtained, quality assurance was pursued through thorough training of the study teams, hiring experienced team leaders, supportive supervision and simple clearly stated questions. The principal investigator also observed first few interview sessions. This provided an opportunity for the principal investigator to learn about the common errors or mistakes. This facilitated timely rectification. Besides, the team leader gave priority to daily checking of all the completed questionnaires for errors, omissions, and discrepancies. For all these, the enumerator(s) concerned were asked to correct before proceeding to the next task. The enumerators also use probing techniques where necessary in both qualitative and quantitative components. This enabled them to collect as much correct information as possible. Once the data was collected, entered and tabulated, statistical checks for errors and for inconsistency of responses were performed.



### **3.10. Data Management and Analysis**

#### **3.10.1. Data Entry and Cleaning**

Data entry template was developed in Statistical Package for Social Scientist (SPSS) version 17 after pre-testing the questionnaire. Data from the questionnaires was entered immediately after thorough checking. For the informal interviews, coding of data started in the field through the use of a code book. This hastened the data entry process and subsequent cleaning and analysis. The data from the registers and monthly monitoring reports was transferred to a computer and analysed through SPSS and EXCEL.

Data cleaning was done by running and tabulating all the variable frequencies in SPSS. Using this package, missing values, wrong entries and outliers were identified and omitted before analysis. For qualitative data, after each field day, the study team met to look into the data collected through key interviews and focus group discussions and was interpreted jointly. The obtained data was validated through interviewees by repeating what they had explained. This was done to ensure that what was recorded was exactly what they had said.

#### **3.10.2. Data Analysis**

Data analysis involved first level descriptive statistics, proportions and frequency distributions for categorical data. Second level analysis using SPSS was aimed at establishing significant differences between variables, and so included use of Chi-square where applicable, paired t- test, F-test, correlation and regression. Thematic analysis was used for qualitative data. At the end of the entire field work, the principal investigator transcribed the data, analysed the whole data set and made content analysis.

## CHAPTER FOUR: RESULTS

This chapter presents the study results including clients' demographic and socio-economic characteristics, adherence to nutrition treatment protocols, progress in weight gain, level of nutrition knowledge, morbidity experience, adherence to drug treatment, mean length of stay in and trend of discharge rates from NCST. Also presented in this chapter are results on the clients', guardians', communities' and health workers' perceptions (and SWOT) on the NCST programme. The 187 clients who constituted the sample were obtained from two districts of Dowa and Ntchisi in Malawi.

### 4.1 Demographic and Socio-Economic Characteristics

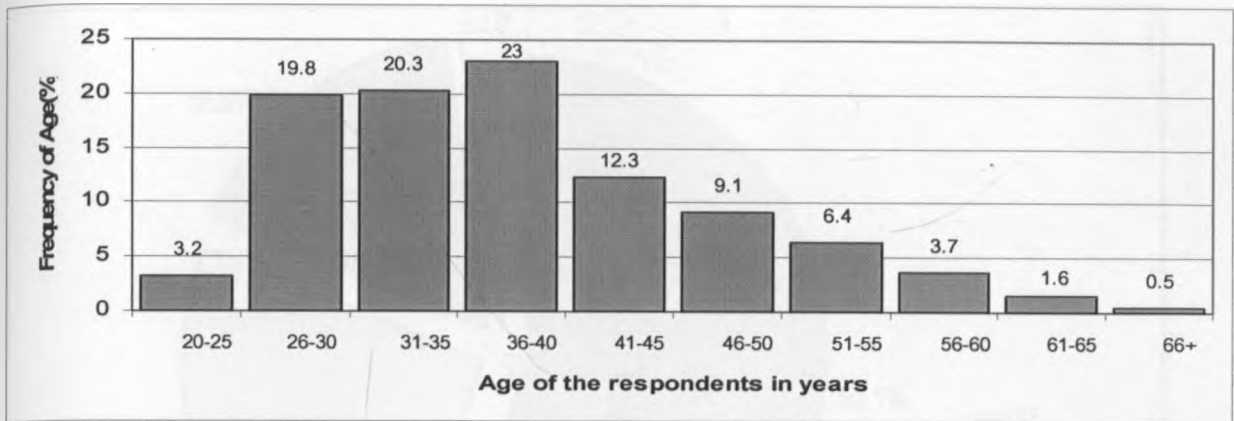
#### 4.1.1 Household and Clients' Characteristics

The mean household size and dependency ratio were  $5.02 \pm 2.2$  and 1.07 respectively. A significantly larger proportion of the clients were female (66.8%),  $\chi^2=42.5$ ,  $p=0.000$  (Table 4.1).

**Table 4.1: Distribution of Study Clients by Gender**

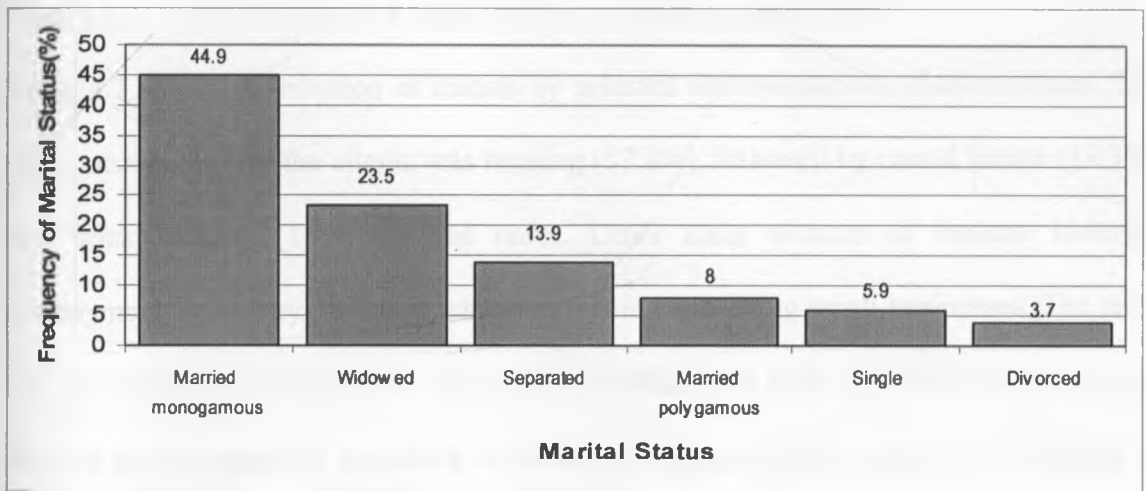
Characteristics	Respondents (n=187)	
	Frequency	%
Sex distribution		
Male	62	33.2
Female	125	66.8

The mean age of the clients in the study was  $38.2 \pm 9.1$  (n=187). Figure 4.1 shows the distribution of study clients by age. Majority of the study clients were aged between 26-40 years while only a small proportion was aged 20-25 years.



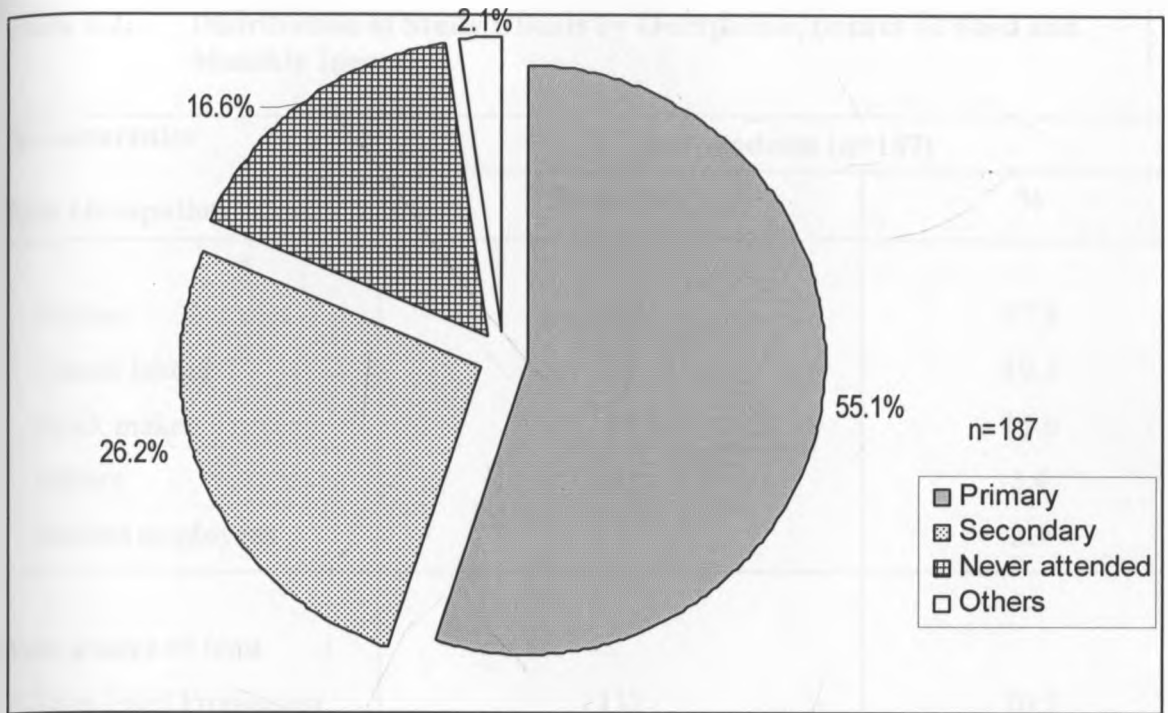
**Figure 4.1: Distribution of Study Clients by Age**

Figure 4.2 shows the distribution of study clients by marital status. Almost half of the study clients were monogamously married at the time of the study, about one-quarter were widowed while the rest were either separated, polygamously married, single or divorced.



**Figure 4.2: Distribution of Study Clients by Marital Status**

Figure 4.3 shows the distribution of study clients by educational level. The majority of the clients attained primary education, one-quarter had attained secondary education while about 17% never attended school. The literacy level among the clients was 81.3% and only 18.7% of the clients said they could not read or write.



**Figure 4.3 Distribution of Study Clients by Educational Level**

Table 4.2 shows distribution of clients by selected socio-economic characteristics. The major occupation for the clients was farming (57.8%), followed by casual labour (19.3%) and brick making (15%) in that order. Other main sources of income included employment, carpentry, tailoring, charcoal making and doing small businesses. The table also shows that the majority of the clients obtained food from own production (70.5%) while a small proportion depended on borrowed food (with the intention of returning or paying back) and “Ganyu” (work for food).

**Table 4.2: Distribution of Study Clients by Occupation, Source of Food and Monthly Income**

Characteristics	Respondents (n=187)	
	Frequency	%
<b>Main Occupation</b>		
Farmer	108	57.8
Casual labour	36	19.3
Brick maker	28	15.0
Others	10	5.4
Retired employees	5	2.7
<b>Main source of food</b>		
Own Food Production	132	70.5
Purchased Food	40	21.4
Ganyu (work for food)	13	7.0
Borrowed Food	2	1.1

### Clients' Monthly Income

The overall mean monthly income of the clients was MK2342.06±1202.19 (Note: 1 United States Dollar is equivalent to 150 Malawi Kwacha). The mean monthly incomes for the males (MK2529.33±1281.24) was not significantly different ( $t=1.278$ ,  $p=0.203$ ) from that of females (MK2267.77±1166.55).

#### 4.1.2 Water and Sanitation

Table 4.3 shows the distribution of clients' households by water source and sanitary facility. Over three-quarters (78.1%) of the respondents obtained their water for domestic use from safe sources, a higher proportion of the households using borehole with pump

followed by piped water, protected dug wells and protected springs in that order. Almost one-quarter (22%) of the clients reported to be using unsafe water sources comprising mainly unprotected dug wells followed by unprotected springs and ponds, rivers or streams (Table 4.3).

The study revealed that more than one-third of the clients (38.0%) take less than 15 minutes to fetch water and return to their homes (Table 4.3). Some of the clients reported that the water was within their dwelling/yard/plot (17.1%).

The majority of the respondents had access to the traditional pit latrine as the sanitary facility for disposal of faecal matter (Table 4.3). Other types of sanitary facilities included flush-to-sewage system, improved pit latrine (VIP) and open pit. A small proportion of clients (3.2%) had no sanitary facility for faecal disposal. Of those clients with a sanitary facility, most (69%) indicated that the facilities were located inside their dwelling/yard/compound while 27.8% had their facilities outside of the dwelling /yard /compound.

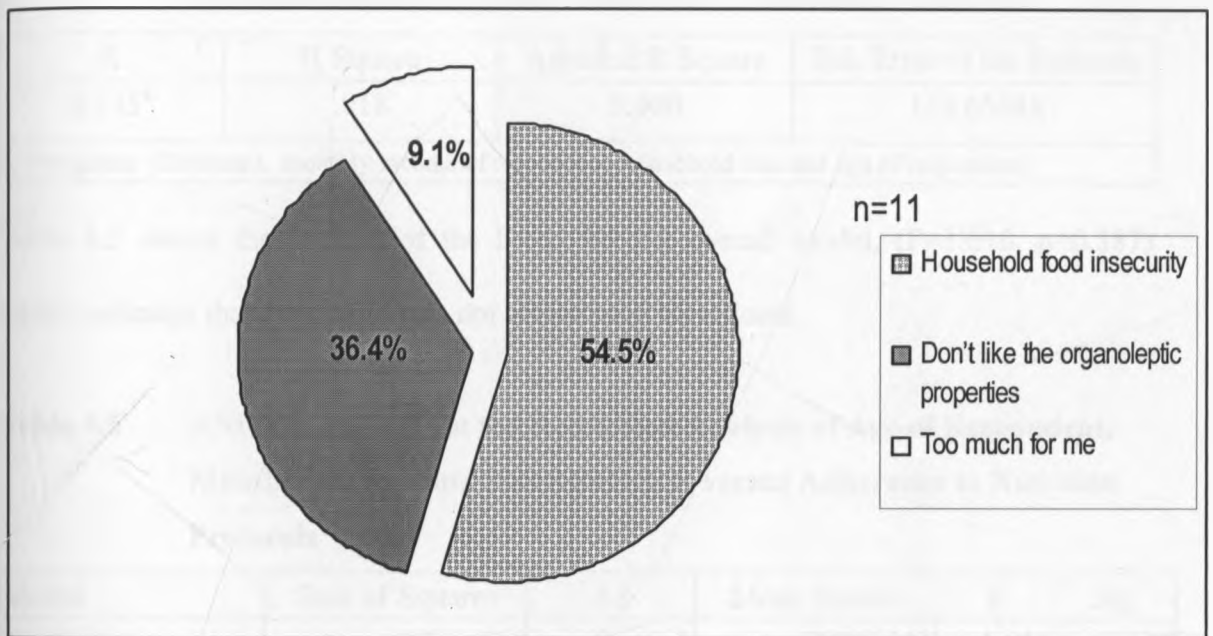
**Table 4.3: Distribution of Clients' Households by Water Source and Sanitary Facility**

Characteristics	Households for the clients	
	Frequency	%
<b>Water source</b>		
Safe sources	146	78.1
Borehole with pump	93	49.7
Protected dug well	21	11.2
Piped water in dwelling	16	8.6
Public tap	12	6.4
Piped into yard or plot	2	1.1
Protected spring	2	1.1
Unsafe sources	41	21.9
Unprotected dug well	36	19.2
Unprotected spring	3	1.6
Pond, river or stream	2	1.1
<b>Time taken to &amp; fro water source</b>		
<15 minutes	71	38.0
16-30 minutes	55	29.4
>30 minutes	29	15.5
In dwelling/yard/plot	32	17.1
<b>Type of sanitary facility available for faecal disposal</b>		
Traditional pitlatrine	166	88.9
Flush to sewage system	7	3.7
Improved pit latrine (VIP)	7	3.7
Open pit	1	0.5
No facility or bush	6	3.2

#### 4.2 Adherence to Nutrition and Drug Protocols

The study results show that the vast majority of the clients (94.1%) were able to finish consuming the entire daily prescribed ration (supplement). All the study clients who did not adhere to nutrition treatment protocols were sharing. None of the respondents reported that they sold the supplement on the market or any other outlet.

Of the 5.9% who did not comply with nutrition treatment protocols, 2.1% were sharing the food supplement with their families on daily basis while 3.8% said they were occasionally sharing the supplements (once or three times in a week as opposed to daily basis). The main reason for sharing was household food insecurity, followed by the fact that the clients did not like the organoleptic properties of the supplement and that the supplement was too much for the client in that order (Figure 4.4).



**Figure 4.4 Distribution of Clients by Reasons for Sharing Supplements**

#### **4.2.1 Adherence to Nutrition Treatment and its Association with Demographic and Socio-Economic Characteristics**

In order to assess the causal relationships between various independent variables (selected demographic and socio-economic factors) and dependent variable (adherence to nutrition protocols, that is, amount of supplements consumed per day) regression analysis was ran.



Table 4.4 shows that the R Square is 0.018. This means that approximately 1.8% of the variance of adherence to nutrition treatment protocols is accounted for by age of respondent, monthly income and household size. The remaining 98.2% of the total variation remain unexplained. Adjusted R-squared indicates that 0% of the variability of adherence to nutrition protocols is accounted for by the model.

**Table 4.4 Regression Model Summary of Age of Respondent, Monthly Income and Household Size versus Adherence to Nutrition Protocols**

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.135 <sup>a</sup>	.018	0.000	115.66048
a. Predictors: (Constant), monthly income of respondent, household size and age of respondent			

Table 4.5 shows the p-value of the F-test for the overall model, (F=1.016, p=0.387) which indicates that the model was not statistically significant.

**Table 4.5 ANOVA Table from the Regression Analysis of Age of Respondent, Monthly Income and Household Size versus Adherence to Nutrition Protocols**

Model	Sum of Squares	d.f	Mean Square	F	Sig.
Regression	40756.324	3	13585.441	1.016	0.387
Residual	2207262.043	165	13377.346		
Total	2248018.367	168			

Table 4.6 shows that the causal relationships of age of respondent, monthly income and household size were not statistically significant (p-values 0.735, 0.620 and 0.126 respectively). This implies that the regression coefficient for age of respondent, monthly income and household size were not significantly different from zero. Thus, none of the three independent variables (age of the respondents, average monthly incomes and household sizes) emerged as a predictor of amount of ration consumed per day.

**Table 4.6 Strengths of Coefficients of Model Predictors of Age of Respondent, Monthly Income and Household Size versus Adherence to Nutrition Protocols**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	277.172	41.949		6.607	.000
Age of respondent	.348	1.026	.027	.339	.735
Household size	2.124	4.274	.039	.497	.620
Monthly income of respondent	.012	.008	.120	1.538	.126

#### 4.2.2 Adherence to Medical Treatment

The data shows that almost all the clients (99.5%) never missed their pills (ARVs). Only a small proportion of the clients reported having missed their ART tablets in the preceding period (last month). These respondents (0.5%) cited illness or health problems as a cause of non-adherence to drug treatment. These results showed achievement above the set target of 95%. There was a significant difference between observed adherence and the programme target,  $\chi^2 = 6.58$ ,  $p=0.010337$ .

#### 4.2.3 Association between Adherence to Nutrition Protocols and Morbidity Experience

Table 4.7 shows that clients who complied or adhered to nutrition treatment protocols were 0.41 times less likely to experience ailment than those who did not (OR = 0.41 , 0.11 – 1.56 C.I). The 95% confidence interval includes 1; hence, the odds ratio was not statistically significant. This result can probably be attributed to the small numbers.

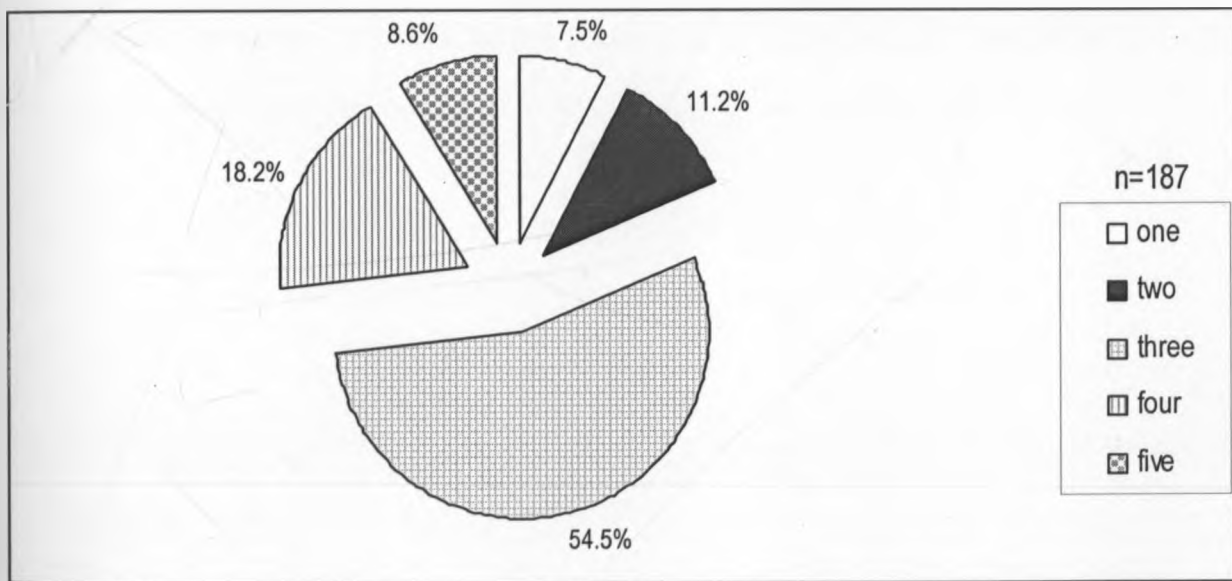
**Table 4.7**      **Distribution of Clients by Adherence to Nutrition Protocols and Morbidity Experience**

		Experienced morbidity		Total
		yes	no	
Adherence to Nutrition	Yes	92	84	176
	No	8	3	11
Total		100	87	187

Odds Ration = 0.41, Confidence Interval = 0.11 – 1.56

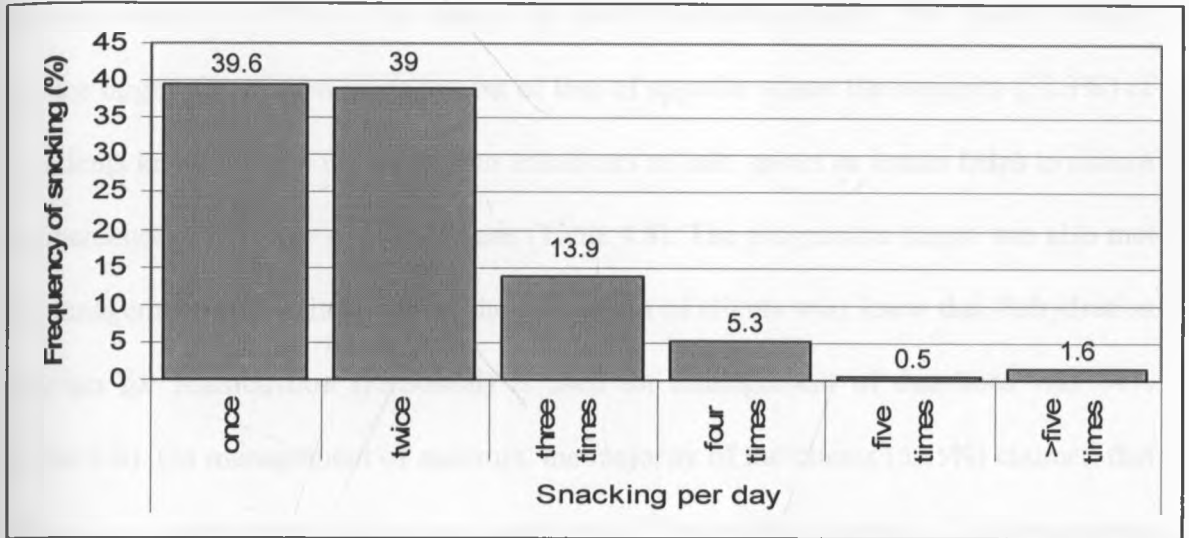
**4.3 Meal Practices**

As shown in figure 4.5 almost more than half of the clients (54.5%) ate three meals everyday. The percentage of clients that ate one meal everyday was 7.5%. Only a small proportion of the clients reported taking five meals everyday.



**Figure 4.5: Distribution of Clients by Number of Meals Taken Everyday**

Figure 4.6 shows the distribution of clients by number of snacks taken everyday. The majority of the respondents reported eating snacks either once (39.6%) or twice (39%) a day. Other ate snacks three to five times a day.



**Figure 4.6: Distribution of Clients by Number of Snacks Taken Everyday**

## **4.4 Nutrition Knowledge**

### **4.4.1 Clients' Knowledge of the Nutritional Remedies for Management of Ailments**

The programme targets on knowledge of nutritional remedies for management of ailments were set at 50% of the clients for each individual remedy. The results indicate that the target was met on management of loss of appetite where the majority (52.3%) of the clients knew that the use of flavour enhancers as salt, spices or lemon helps to reduce the incidences of change or loss of taste (Table 4.8). The programme target was also met on management of diarrhoea where the proportion of clients who knew that Rehydration Solution for Malnutrition (ReSoMal) is used for management of diarrhoea was 84% (Table 4.8). On management of anaemia, the majority of the clients (53.5%) claimed that taking iron supplements/tablets was one way of managing anaemia. The programme target was also achieved for this remedy (Table 4.8). As far as food avoidance is concerned, the majority (61%) of clients claimed alcohol consumption needed to be avoided. This was higher than the target of 50% (Table 4.8).

However, the targets were not met on management of loss of appetite (Table 4.8) and management of nausea and vomiting (Table 4.8). On management of constipation and dry mouth the programme target of 50% was almost achieved. About half (48.1%) of the clients said that rinsing mouth with clean warm salty water helps to reduce the incidences of dry mouth (Table 4.8) while about half (49.2%) of the clients said that drinking plenty of fluids was one way of managing constipation (Table 4.8).

**Table 4.8 Distribution of Clients by Knowledge of Nutritional Remedies for Management of Ailments**

Nutritional Remedies	Respondents (n=187) (%)	Target (%)	Target Achieved	Gap (%)	Statistics	
					$\chi^2$ value	P-value
<b>Management of loss of appetite</b>						
Eat favourite foods	35.3	50	No	-14.70	8.56	0.00343
Avoid smelling food	29.4	50	No	-20.60	16.97	0.000038
Eat small/frequent Meals	18.7	50	No	-31.30	41.19	0.000000
Select foods that are rich in energy	17.6	50	No	-32.40	44.36	0.000000
Drink small sips of fluids	11.8	50	No	-38.20	64.78	0.000000
Don't know	22.5					
<b>Management of loss of taste</b>						
Use flavour enhancers	50.3	50	Yes	+0.30	0.00	0.000000
Chew food well and move it round	21.4	50	No	-28.60	33.91	0.000000
Clean mouth every morning	12.3	50	No	-37.70	62.70	0.000000
Don't know	34.8					
<b>Management of constipation</b>						
Drink plenty of fluids	49.2	50	No	-0.80	0.04	*0.836136
Eat food high in fibre-meals, fresh vegetables	26.7	50	No	-23.30	21.86	0.000000
Exercise regularly	21.4	50	No	-28.60	33.91	0.000000
Avoid refined foods	12.8	50	No	-37.20	60.67	0.000000
Don't know	19.8					
<b>Management of fever</b>						
Drink plenty of fluids	32.6	50	No	-17.40	12	0.000532
Don't know	67.4					
<b>Management of diarrhoea</b>						
Prepare & drink ReSoMal	84	50	Yes	34.00	48.08	0.000000
Drink plenty of fluids	19.3	50	No	-30.70	39.66	0.000000
Continue eating during and after illness	12.3	50	No	-37.70	62.70	0.000000
Avoid fried foods	4.3	50	No	-45.70	99.70	0.000000
Don't know	4.3					

N.B.: Asterisk (\*) indicates not significant at  $p < 0.05$ .

**Table 4.8 Distribution of Clients by Knowledge of Nutritional Remedies for Management of Ailments**

Nutritional Remedies	Respondents (n=187) (%)	Target (%)	Target Achieved	Gap (%)	Statistics	
					$\chi^2$ value	P-value
<b>Management of nausea and vomiting</b>						
Avoid having empty an stomach	24.6	50	No	-25.4	26.30	0.000000
Drink after meals and limit Intake of fluids with meals	15.5	50	No	-34.5	51.18	0.000000
Rest between meals	15	50	No	-35.0	52.99	0.000000
Eat small salt quantities and dry foods to calm the stomach	11.8	50	No	-38.2	64.78	0.000000
Eat small and frequent meals	10.7	50	No	-39.3	69.10	0.000000
Avoid lying down immediately after eating	6.4	50	No	-43.6	88.52	0.000000
Don't Know	42.2					
<b>Management of dry mouth</b>						
Rinse mouth with clean warm salty water	48.1	50	No	-1.9	13.55	0.00023
Avoid very hot foods, sweets and drinks with a lot of caffeine etc	31.6	50	No	-18.4	0.17	*0.67908
Don't Know	38.5					
<b>Management of anaemia</b>						
Take iron supplement/tablets or other formulation with advice from doctor	53.5	50	Yes	+3.5	0.39	*0.53464
Eat foods like animal meats, dark green leafy vegetables	48.7	50	No	-1.3	0.10	*0.75636
Increase the intake of fruits like oranges and mangoes after meal	13.9	50	No	-36.1	56.74	0.000000
Reduce the intake of tea and coffee immediately after meals	5.3	50	No	-44.7	93.98	0.000000
Ensure treatment for malaria and hookworms or other parasites	1.1	50	No	-48.9	118.61	0.000000
Don't know	12.8					
<b>Knowledge of foods to avoid</b>						
Alcohol	61	50	Yes	+11.0	4.33	0.04
Large amount of sugar	22.5	50	No	-27.5	31.24	0.000000
No need to avoid anything	21.4	50	No	-28.6	33.91	0.000000
Coffee	5.3	50	No	-44.7	93.98	0.000000
Fatty foods	4.8	50	No	-45.2	96.81	0.000000
Fried foods	0.5	50	No	-49.5	122.04	0.000000
Don't know	7.5					

N.B.: Asterisk (\*) indicates not significant  $p < 0.05$ .

#### 4.4.2 Clients' Score on Nutrition Knowledge

Nutrition knowledge of the clients was scored out of 37 to determine individual clients' attainment of knowledge of nutritional remedies for management of ailment or symptoms. The mean score was  $11.7 \pm 2.3$  (31.6%). The highest scored 26 (70.2%) and the lowest scored 8 (21.6%). There were no outliers that were removed.

The majority of the study clients (98.9%) scored less than 50%, which is the expected programme target. Only 1.1% of the clients managed to score more than 50%.

#### 4.5 Progress in Weight Gain

Figure 4.7 shows the mean weight of the clients from admission and consecutive visits, through to day of the study. The results of the study show that the clients had a steady upward increase in weight. The mean weight on admission was  $43.0 \pm 4.2$  kg. By week eight, the mean weight was  $45.9 \pm 4.2$  kg. Comparing the mean weights on admission and 8<sup>th</sup> week, the results indicate that there was significant difference ( $t=293.32$ ,  $p=0.000$ ).

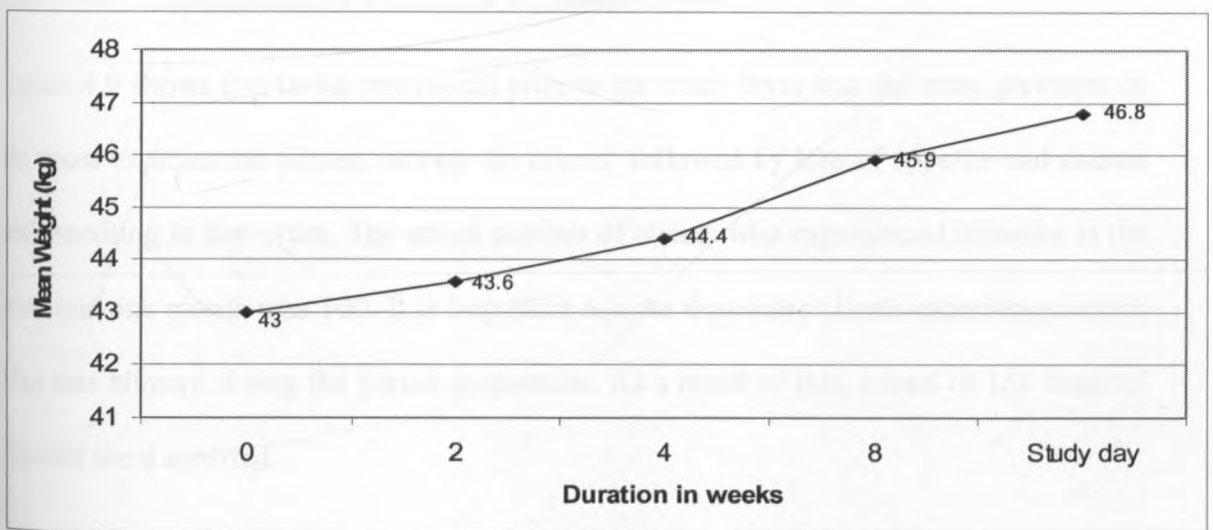
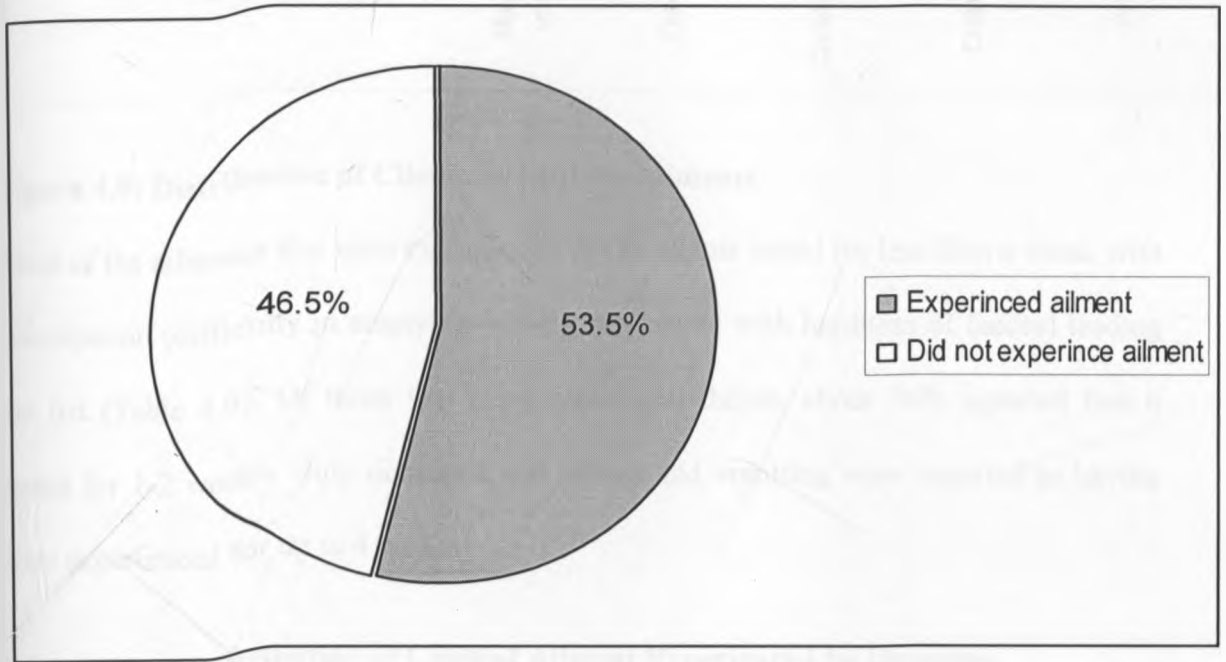


Figure 4.7: Trends in Mean Weight of the Study Group by Duration



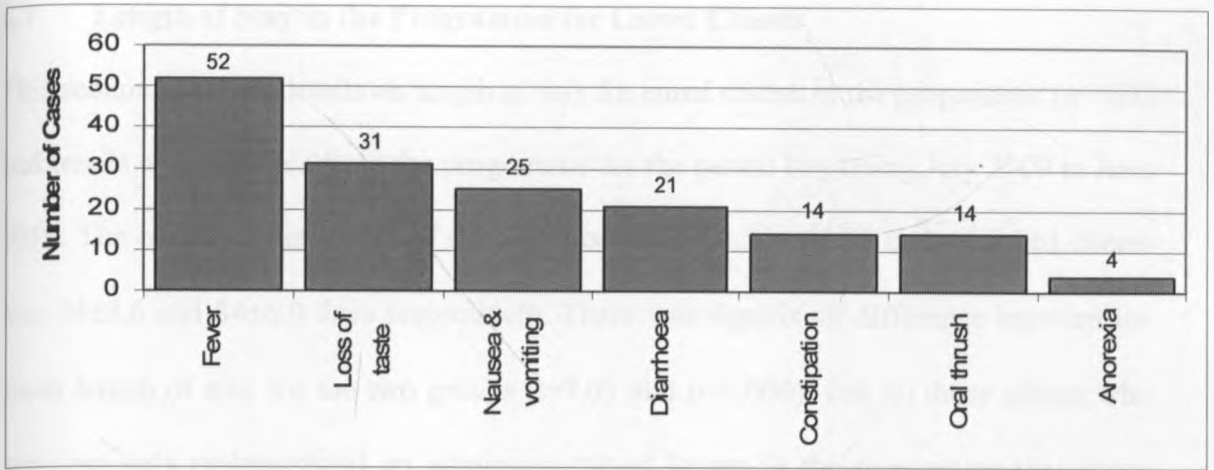
#### 4.6 Morbidity Experience

Figure 4.8 shows that the majority of the study clients (53.5%, where  $n = 187$ ) experienced an ailment while 46.5% did not experience any ailment in the previous one month. However, there was no significant difference between the two proportions ( $\chi^2 = 1.81, p=0.1788$ ).



**Figure 4.8: Distribution of Clients by Morbidity Status**

Figure 4.9 shows that in the one month prior to the study fever was the most prevalent or the most experienced ailment among the clients, followed by loss of appetite and nausea and vomiting in that order. The actual number of clients who experienced ailments in the previous one month was 100. It is important to note that some clients experienced more than one ailment during the period in question. As a result of this, a total of 161 cases of ailment were reported.



**Figure 4.9: Distribution of Clients by Specific Ailments**

Most of the ailments that were experienced by the clients lasted for less than a week, with constipation (difficulty in emptying bowels, associated with hardness of faeces) leading the list (Table 4.9). Of those that experienced oral thrush, about 36% reported that it lasted for 1-2 weeks. Only diarrhoea and nausea and vomiting were reported as having been experienced for up to 4 weeks.

**Table 4.9 Distribution of Cases of Ailment Experienced by Duration**

Duration of experiencing ailment	Cases of ailment reported by clients (n=161)						
	Nausea & vomiting n=25	Loss of taste n=31	Diarrhoea n=21	Constipation n=14	Oral thrush n=14	Fever n=52	Anorexia n=4
	%	%	%	%	%	%	%
<1 wk	72	54.8	57.1	85.7	35.7	73.0	100
1-2 wks	12	29.0	28.6	14.3	35.7	21.2	0
2-3 wks	12	9.7	9.5	0.0	0.0	5.8	0
3-4 wks	4	0.0	4.8	0.0	0.0	0.0	0

#### 4.7 Length of Stay in the Programme for Cured Clients

This section provides details on length of stay for cured clients in the programme (n=163) and trends of discharges from the programme for the period beginning July 2009 to June 2010. The overall mean length of stay for moderately and severely malnourished clients was  $64\pm 8.6$  and  $84\pm 6.9$  days respectively. There was significant difference between the mean length of stay for the two groups ( $t=7.05$  and  $p=0.000$ ), that is, those clients who were severely malnourished on admission stayed longer in the programme than those who were moderately malnourished. Compared with the target, the mean length of stay was well below the set standards of 90 days and 120 days for moderate and severe, respectively.

Figure 4.10 shows the mean length of stay by facility. There was no significant difference between the mean lengths of stay observed in the three health facilities ( $F=1.037$  and  $p=0.362$ ), which were well below the set standards.

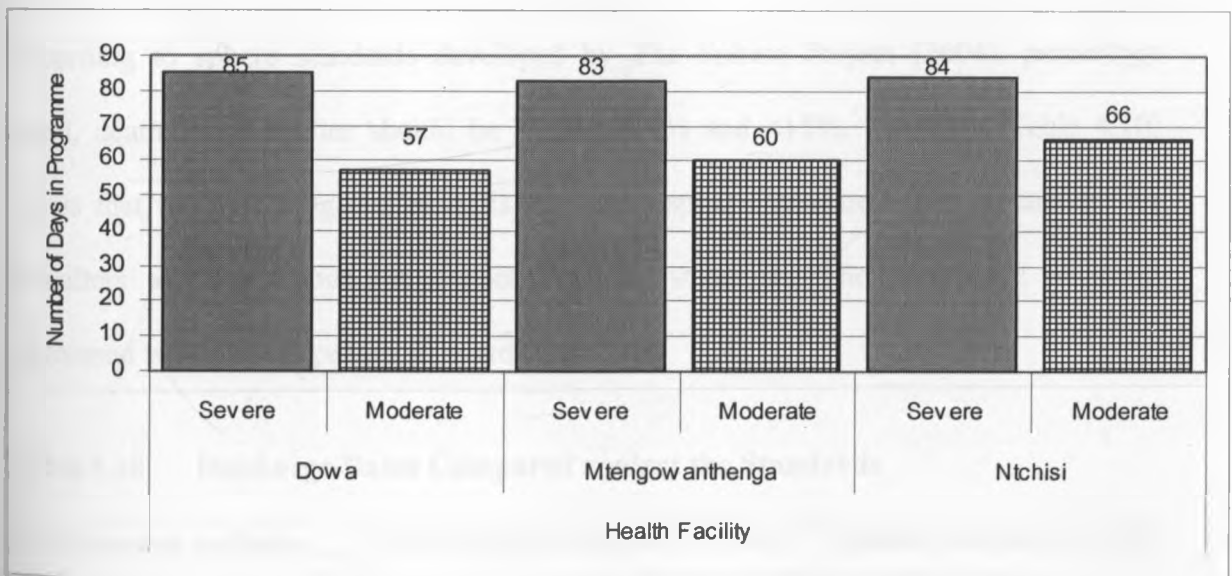
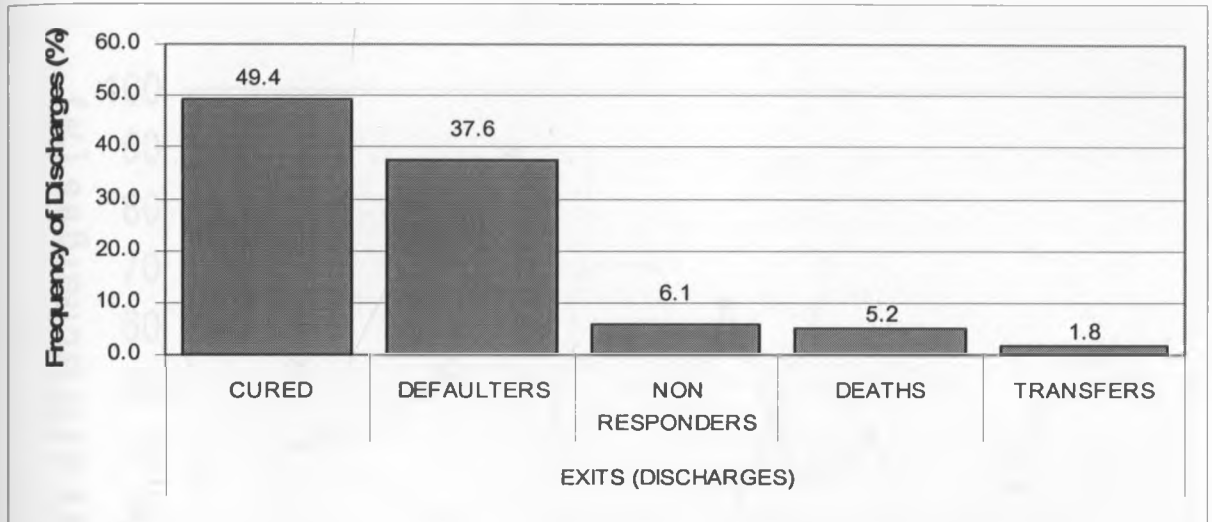


Figure 4.10 Mean Lengths of Stay of Cured Clients in the Programme by Health Facility

#### 4.8 Discharge Rates

Figure 4.11 shows that of the clients (n=330) who were admitted in the programme during the period in question, almost half (49.4%) were discharged as cured, while 5% were reported as having died while in the programme. Defaulters, transfers and non-responders were 37.6%, 1.8% and 6.1% respectively.



**Figure 4.11 Discharge Percent for the Period between July 2009 and June 2010**

According to sphere standards developed by The Sphere Project (2004), percentage cured, death and defaulter should be >75%, <10% and <15%. The data (Table 4.10) shows that the percentage of cured is far below sphere standards. The percentage for defaulters too was above the expected sphere standards. The percentage of death performed within the expected standards.

**Table 4.10 Discharge Rates Compared against the Standards**

Performance indicator	Percentage Achieved (n=330)	Sphere standards (2004)
Cured	49.40	>75%
Defaulters	37.6	<15%
Deaths	5.00	<10%

#### 4.9 Trends in Discharge Rates for July 2009 – June 2010

There were variations in the discharges across the period in question with October 2009 recording the highest (89.1%, n=55) number of cured clients (Figure 4.12). The highest percentage of death (22.7%, n=22), defaulters (70.3%, n=24) and non-responders (23.8%, n=42) were in April 2010, December 2009 and May 2010 respectively.

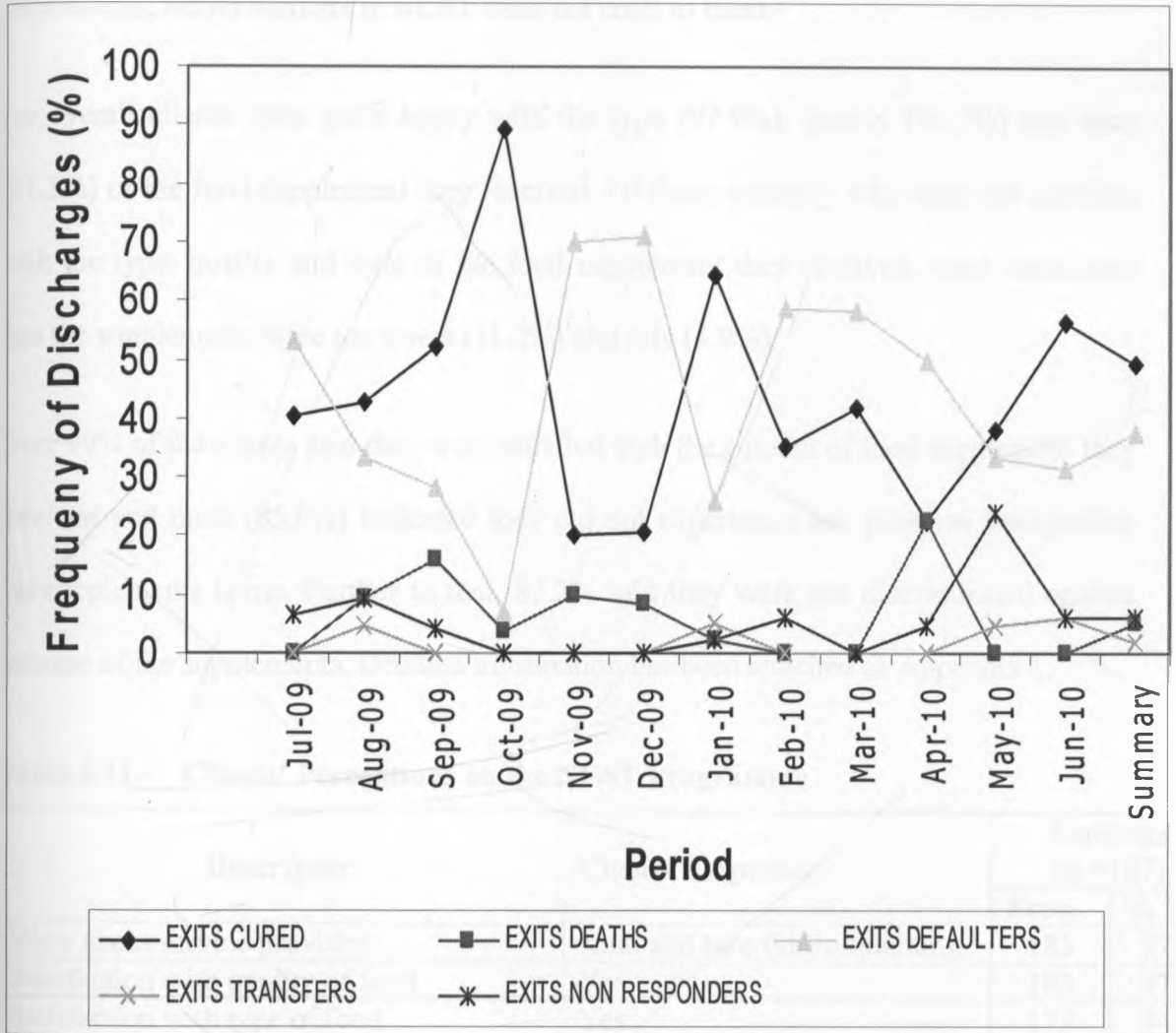


Figure 4.12 Trends in Discharge Rates for the Period between July 2009 and June 2010

## 4.10 Perceptions on NCST Programme

### 4.10.1 Client's Perceptions on the NCST

Table 4.11 shows that most of the clients (97.5%) reported that the service providers (health workers) were kind and took time in explaining issues. According to the respondents, health workers in NCST were not cruel to them.

On overall clients were quite happy with the type (97.9%), quality (94.7%) and taste (81.3%) of the food supplement they received. Of those minority who were not satisfied with the type, quality and taste of the food supplement they received, most mentioned that the supplements were too sweet (11.2%) and oily (5.9%).

Over 90% of the clients said they were satisfied with the amount of food supplement they received and most (85.6%) indicated they did not experience any problem transporting the supplements home. Further to that, 87.2% said they were not discriminated against because of the supplements. Detailed information has been attached as Appendix 1.

**Table 4.11 Clients' Perceptions on the NCST Programme**

Descriptor	Clients Responses	Statistics (n =187)	
		Freq.	%
View about service providers	Kind and take time explaining	183	97.9
Satisfaction with quality of food	Yes	183	97.9
Satisfaction with type of food	Yes	177	94.7
Enjoy taste of food supplement	Yes	152	81.3
Satisfaction with amount of food	Yes	172	92.0
Challenges with transporting supplements	No	160	85.6
Ways of improving programme	Programme should continue and avoid stock out of RUTF	126	67.4
	Consider distributing other foods & basic necessities	25	13.4

#### 4.10.2 Guardians and Community Perceptions on the NCST Programme

The results from FGDs indicated that the programme was positively perceived as being beneficial to the clients (as seen from weight gained by the clients). The people were, however, dissatisfied with supply chain management (seen from erratic supply and shortage of RUTF). The results on the guardians and community perceptions have been summarized on Table 4.12.

**Table 4.12: Perceptions of Guardians and Community on the NCST Programme**

ASPECT/THEME	GUARDIANS AND COMMUNITY PERCEPTION
Type of food, frequency of distribution and distribution modalities	Clients received RUTF. Ration distribution happened on monthly basis unless there is stock out. Client had to come in person to collect the ration because anthropometric measurements were also taken
Reasons why client would fail to collect ration in person	<ul style="list-style-type: none"> <li>• Too sick or too weak to walk/travel</li> <li>• Stock outs discouraging the clients</li> <li>• No enough money for transport</li> </ul>
Mechanism to prevent sharing	Clients were advised that food supplement were part of their treatment and had to adhere to protocols.
Benefits of food supplement	Nutrition status improved and frequency of illness reduced
Benefits of counseling sessions	Clients adhere to practices that promoted their well being.
Majority in programme (by age, sex and locality)	Women of 18 years and above (reproductive age group). Most came from the rural areas.
Reason why in majority	Majority of women attended medical services than men, hence easily identified.
Stigma associated with RUTF	Some form of stigma was there. Seen as some clients refused to take RUTF even if they were malnourished and others refused to take RUTF in their original carton.
Service utilisation Hindrances	Although the services were generally good, low supply of food supplements and long distances to the health facilities hindered utilization of services.
Preparation for discharge	<ul style="list-style-type: none"> <li>• Conducted Health and nutrition education on eating multimix meal using locally available food</li> <li>• Clients were joining food security programmes</li> </ul>
Addressing objectives	The programme was addressing and meeting the intended objectives but with hiccups.
Recommendation	<ul style="list-style-type: none"> <li>• Ensure consistent supply of RUTF</li> <li>• Introduce outreach services</li> <li>• Introduce Income Generating Activities (IGAs)</li> <li>• Thoroughly prepare clients for discharge</li> </ul>

#### **4.10.3 Specific Highlights from the Key Informant Interviews**

The results of the key informant interviews indicated that some of the service providers were aware of the background of the programme and its objectives. Almost half of the KIIs were able to tell the admission criteria for clients in the programme and all of them were able to tell the type of supplement and how much ration was to be given to clients.

It was pointed out that the proportion of the rural and low income (poor) women of reproductive age group were higher compare to any other section of people, reason being that majority of those who attended medical services such as HIV testing and counselling) were mostly women when compared to men, hence easily identified and recruited in the programme.

It was also reported that the clients often ate the food directly from the sachets and occasionally through porridge and spreading on bread. In order to achieve high rates of adherence, health workers used IEC (testimonies, sensitization, counseling and health education). This prevented clients from sharing and selling.

According to most of the service providers, the clients stayed in the programme for about 2-3 months (60-90 days) while others indicated 4 months (120 days).

Common challenges reported included inadequate trained staff, lack of supervision, erratic supply of food supplements, and absenteeism on appointment day attributed to clients' sickness coupled with long distances to villages where clients came from.



For the programme to be able to fully meet its objectives, standards and expectations, the KIs suggested that more sites be opened to bring services close to people in remote areas while at the same time ensuring that trained members of staff are deployed to the sites. The services provides also proposed that motorcycles be procured for them for effective and efficient follow up; timely distribution of enough stationary, food supplements and equipment to nutritional sites; and encouraging exchange visits so that service providers and clients could share lessons learnt. Detailed information has been attached as Appendix 2.

#### **4.10.4 Specific Highlights from the SWOT Analysis**

According to the study, the NCST programme has a number of strengths. Commitment by Office of the President and Cabinet to support nutrition and HIV programmes was seen as one of the major strengths. Government of Malawi decided to recognize nutrition and established the Department of Nutrition HIV and AIDS (DNHA) to take full responsibility of coordinating nutrition and HIV programmes. This recognition and subsequent establishment of DNHA has been seen as of great value to the programme. Other notable strengths included: Presence of adequate infrastructure (store rooms) in the facilities that could be used during scale up; stakeholders confidence in the programme; availability of manuals and guidelines; and presence of feedback forums.

One key weakness that was revealed by the programme was that there was inadequate supervision from both the central as well as the district levels. This issue of inadequate supervision was raised by both programme managers at district as well as at national

levels. Although integrated supervision spearheaded by HIV Unit took place, it did not emphasize on the nutrition component. Other important weaknesses included: difficulty accessing some sites; absence of databases; and erratic supply of RUTF.

Existence of network of volunteers in Community-based Management of Acute Malnutrition (CMAM) programme was seen as an opportunity for the NCST programme particularly because the volunteers could also be used for tracking defaulters and conducting referrals. Apart from local production of RUTF, placement of nutrition and HIV on top of Malawi government agenda was also seen as an opportunity for the programme. This is because the programme could easily mobilize financial, human and material resources since it already had political support.

The study results indicated that service providers equated supervision to “policing” instead of perceiving it as a means of perfecting their work. This was one of the key threats observed. Other threats observed included: Staff turnover and heavy workload, global financial crisis and risk of aflatoxins in raw materials especially in peanuts. Detailed information has been attached as Appendix 3.

## **CHAPTER FIVE: DISCUSSION**

### **5.1 Demographic and Socio-Economic Characteristics**

The study findings indicate that over half of the clients in the programme are females, most of them aged between 26-40 years. This is in agreement with the results of the FGDs conducted in the two districts, which indicated that most of the people in the programme are women and are 18 years old and above (reproductive age group). UNAIDS/WHO (2007) also found that majority of HIV infection in Sub-Saharan Africa were women in their prime of productivity.

The mean household size found in this study (5.0) is consistent with what Mtimuni et al (2010) found (which was 5.2). Similarly, the Dependency Ratio (under 15 and 65 + as ratio of population aged 15-64) of 1.07 agrees with the national dependency ratio 1.17 (National Statistics Office, 2009). This dependency ratio shows that there may be an increased burden on the productive section of the population to maintain the upbringing of the economically dependent. This results in direct impacts on financial expenditures. This can lead to stress in homes with meagre monthly incomes.

### **5.2 Adherence to Nutrition Treatment Protocols**

The high adherence on nutrition treatment protocols found in the study is consistent with reports from pilot studies conducted in rural hospitals in Malawi in 2005. AAH (2006) found that there was adherence of over 93%. And in this study, AAH (2006) also indicated that relatively low numbers of patients (clients) shared the supplements they

received with other members of the household. In both studies, household food insecurity is cited as main reason for clients sharing the food supplements (RUTF).

The results of both quantitative and qualitative information on adherence and non adherence are also consistent with Ndekha et al (2009) who indicated that RUTF was shared less often, citing justification that RUTF is ready to be eaten (no hassles of cooking), regarded as a special supplement for clients (a medicinal food).

### **5.2.1 Adherence to Nutrition Treatment and its Association with Demographic and Socio-Economic Characteristics**

The study endeavored to investigate the predictors of amount of ration consumed per day by the clients. The factors were age of the respondents, average monthly incomes and household sizes. It was assumed that the smaller the household sizes, the higher the adherence since the likelihood of supplements being shared with family members is small. Similarly, the higher the average monthly income, the higher the compliance since clients would not be tempted to sell part of their daily ration. It was further assumed that the younger the clients, the higher the adherence since young people tend to like sweet foods.

Age of the respondents, average monthly incomes and household sizes did not emerge as predictors of amount of ration consumed per day. Ndekha et al (2009) observed that the nature of the supplement influenced how much to consume. RUTF is ready to be eaten (no hassles of cooking), regarded as a special supplement for clients (a medicinal food). These attributes may have contributed to high consumption of the ration per day.

### **5.3 Adherence to ART/Drug Treatment Protocols**

On high adherence on drug treatment protocols, the study results are consistent with reports from a study conducted in urban referral hospital in Malawi in 2009. Ndekha et al (2009) found adherence of over 95%. Ndekha et al (2009) also indicated that few participants (4.8%) reported missing a dose in the previous weeks. This is because most technical staff (nurses and clinicians) also emphasize on drug protocols during health talks. Besides, each client must have someone to remind them to take their drugs.

In a trial conducted by Cantrell et al (2008) in Zambia assessing ART adherence among HIV infected patients who received food supplements and those that did not receive supplements, the results of the trial revealed that adherence was better among those that received supplementary food. The reason could probably be that food supplementation promotes drug efficacy, which can lead to quality of life of the clients. Clients who are feeling better are more likely to take their drugs without problems.

### **5.4 Meal Practice and Nutrition Knowledge**

The meal practices and nutrition knowledge are poor, consistent with Ndekha et al (2009) who observed that in the urban referral hospitals the habitual diets of the participants were poor, only 30% achieved a dietary diversity. Findings from a formative assessment of Food and Nutrition Implications of ART in Kenya for instance, also showed that health and nutrition education/counselling components are not adequately addressed (Muhomah, 2008). Teferra et al (2007) found out that some eligible clients booked for group counseling drop out of the counseling process. However, their study did not manage to establish reason for dropping out.

In addition to this, feedback reports compiled by Ministry of Health (2009) indicated that the programme had lack of translated take home materials and the health workers were burdened with a lot of work, which might probably have led to poor performance on nutrition education. The nutrition capacity assessment reports conducted by Department of Nutrition HIV and AIDS and Food Agriculture Organisation (2009) reveal gross shortage of nutritionists in the districts (health facilities). Further to that, the report also points out the fact that there are high vacancy rates and most of the existing posts in nutrition are occupied by staff with insufficient qualifications and training. The programme is mostly manned by either clinicians or nurses who are busy and often delegate to low cadre/frontline health staff (health surveillance assistants).

### **5.5 Progress in Weight Gain**

The findings of steady increase in weight among clients over time are consistent with some previous observations of supplementary feeding with energy-dense foods in HIV infected persons. Ndekha et al (2009) found that in wasted patients initiating ART, food supplementation with RUTF resulted in a greater increase in body weight (and mid-upper arm circumference) after 3.5 months. In addition, findings from an NCST pilot programme in rural Malawi that provided RUTF as a supplementary food in 2004 indicated that patients receiving RUTF had greater weight gain (AAH, 2006). Thus, the study has demonstrated that an energy-dense supplement (RUTF) promotes better nutritional recovery over time. Ndekha et al (2009) observed that RUTF promoted greater weight gain because of its higher energy density thereby allowing adequate energy intake in clients. The high levels of adherence to nutrition protocols can also explain this

progress in weight gain. It should be noted however that the study did not establish whether the increase in weight was as a result of accumulation of fat or lean muscle. However, in wasted patients starting antiretroviral therapy, food supplementation with ready-to-use fortified spread resulted in a greater increase in fat-free body mass (Ndekha et al, 2009).

## **5.6 Morbidity Experience**

The relatively higher morbidity experience among clients can be attributed to lack of knowledge of prevention and management of common ailments associated with both HIV and ART. Some studies indicated that counselling (and education) has potential of improving clients' techniques for managing (and preventing) HIV medication-related symptoms (Okumu, 2009). In the present study, most clients did not have the knowledge and skills for managing and preventing such conditions, hence, high morbidity rates. Besides, AAH (2006) observed that most HIV infected patients in Malawi start ART when they are in stage 3 or 4, which is associated with factors such as advanced AIDS and high rate of opportunistic infections.

## **5.7 Length of Stay in the Programme for Cured Clients**

The study found out that those clients who were severely malnourished on admission stayed longer in the programme than those who were moderately malnourished. Results of studies conducted on non HIV positive children indicated that children with moderate malnutrition stayed shortest in nutrition programme (Aluoch, 2001). Although the outcomes of the study are consistent with Aluoch (2001), they are unexpectedly below the programme targets. The results suggest that some clients are discharged earlier than

expected. This could be attributed to inadequate capacity building, coupled with lack of supervision at the implementing sites. There is a possibility that health workers could create “ghost” beneficiaries who could be admitted and discharged from the programme at will or at anytime. Further to that, there is a possibility that some clients are admitted outside the criteria because of pressure leading to early discharge. These results could also be explained by health workers’ misunderstanding of the discharge criteria considering that some did not get training but a brief orientation on the programme (Ministry of Health, 2009).

## **5.8 Discharge Rates**

The rates of cured and defaulters in the programme are not up to sphere standards, however, the death rates are within the expected sphere standards. Outcomes on cured rates are consistent with what AAH (2006) observed in that the cure rates were lower than the programme targets at the end of pilot project conducted in rural hospitals. Thurstan and Corbett (2005) reported similar outcomes in studies involving malnourished HIV positive children in Malawi. The difference between the current study and the AAH (2006) report is that the pilot programme performed within sphere standards for defaulter rates but not for mortality rates.

The current percentage of defaulters is high because of erratic supplies of RUTF in the sites. AAH (2007) observed that the sites experience stock outs of RUTF, which deny many clients of treatment. When clients are informed that the facilities have ran out of supplies, often times they do not come to check for the same during next appointment



dates since most of them come from far rural areas. If the stock out lasts for more than over two consecutive appointment dates, the clients are discharged as defaulters.

In view of the above, the percentage of cured is consequently affected as the numbers who get discharged as cured become smaller. In addition to this, poor documentation coupled with poor tracking of indicators has led to some clients staying in the programme without being discharged (Ministry of Health, 2009).

Van der Sande et al (2004) observed that malnutrition in HIV infected people is a strong predictor for mortality. According to their study, clients with BMI <16 were more likely to die than those with BMI >22. This explains why some of the clients were exited from the programme as deaths.

A study conducted by Wheeler et al (1998) identified that as little as 5% weight loss is associated with increased risk of opportunistic complications. Opportunistic infections can affect consumption and metabolism hence interfering with recovery. This can lead to over stay in the programme, consequently clients being discharged as non responders. Clients who stay in the programme beyond 4 months without reaching the target discharge (cure) criteria are discharged as non responders.

The study shows that the percentages of both cured and defaulters were consistently not up to standard compared to targets through out the period of review, with an exception of October 2009. Stock outs pointed out earlier coupled with lack of human resources and logistics for follow up of the clients can lead to high defaulters. Both service providers and guardians indicated that clients had to be sent back home empty handed for some months. When this continued, clients tend not to honour appointment days.

## 5.9 Perceptions on NCST Programme

The study indicates that most of the clients are quite happy with the conduct of the health workers on duty and the properties of the food supplements they are receiving. This is consistent with Ndekha et al (2009) who found that food supplements were universally highly appreciated by clients. Most clients like the fact that the supplements do not require cooking. In addition, the clients also like the taste, flavour, quality and quantity of the supplements they receive.

Information gathered from FGDs indicates that the programme is positively perceived as being beneficial to the clients (as seen from weight gained by the clients). The people are, however, dissatisfied with supply chain management (seen from erratic supply and shortage of RUTF). These results are consistent with what AAH (2006) observed that the clients were at some point in time denied of supplements because of stock out of the same. Procurement and distribution of the food supplement at central level sometimes impedes implementation of the programme at districts and facility levels. There are times when the supplies are procured and distributed late to the sites. This leaves the clients without the food supplements. This is worsened by inconsistent and incomplete monthly reporting from the facilities and districts (Ministry of Health, 2009) that often lead to poor estimation of required supplies.

According to the SWOT analysis, staff turnover and heavy workload are some of the key weaknesses of the programme. This is consistent with Department of Nutrition HIV and AIDS and Food Agriculture Organisation (2009) which revealed that the Ministry had high vacancy rates and most of the existing posts in nutrition were occupied by staff with

insufficient qualifications and training. Inadequate staffing may have also contributed to inadequate supervision from both the central as well as the district levels.

And since some of the service providers were not trained, they may have feared to be visited by technical staff for fear of exposing their faults. In view of this, such providers may have perceived as “policing” instead of perceiving it as a means of perfecting their work.

Erratic supply of RUTF is in agreement with Ministry of Health (2009), which also found that stock out of RUTF was common. Global financial crisis coupled with inconsistent reporting may have affected procurement, distribution and sustainability of supplies. Monthly reports from the facilities are often used to estimate three month supplies for the implementing sites. Absence of database and inconsistent reporting leads to poor estimates.

The SWOT analysis, like the FGDs revealed that some NCST sites were in remote and in topographically difficult areas affecting logistics. This may have affected both delivery of supplies to the sites and accessibility by clients. This contributed to high defaulter rate (Ministry of Health, 2009).

## **CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS**

### **6.1 Conclusion**

The study evaluated the performance of the NCST programme implemented in Dowa and Ntchisi Districts in Malawi. It can be concluded from the results that demographic and socio-economic characteristics of clients are not predictors of amount of ration consumed per day.

It can also be concluded that the programme is achieving its targets on adherence of both nutrition and drug treatment protocols, length of stay and weight gain. However, programme is not achieving its targets with regards to clients' nutrition knowledge and discharge rates.

There are generally positive perceptions of the programme from clients, guardians & community, health workers (service providers) and senior government and non governmental officers. However, implementation is marred by challenges that include inadequate trained personnel, stock out of food supplements and lack of stationery.

### **6.2 Recommendations**

It is clear from the results of the study that the programme is and is not achieving some of the expected or intended outcomes. In view of this, the following have been recommended:

- Emphasizing on nutrition and health education (and counselling). This includes deployment of adequately trained staff, conducting in service and refresher training for the service providers so that they are up to date all the time. Furthermore, nutrition

and health education (and counselling) should include distribution of translated take home leaflets, audio-visual and other teaching aids.

- Establishing clear and comprehensive mechanisms for tracking defaulters in the villages. Community based Management of Acute Malnutrition (CMAM) has a very good network of volunteers which could be used for tracking the defaulters. Thus, some components of NCST can be integrated in the CMAM programme. It is also high time the government deployed full time Nutrition and HIV community workers. This cadre would be closer to the clients for easy follow up.
- Embracing newer approaches of monitoring and evaluation. Participatory monitoring and evaluation and Integrated Supportive Supervision could contribute to improvement in the performance of the programmes. Besides, there is need to identify an M and E focal person at both Ministry and OPC/DNHA. This can help facilitate timely establishment of databases and its subsequent maintenance.
- Thorough investigation is required in order to establish realistic expected mean length of stay for the programme. There is no evidence to show that these targets were developed based on scientific study. Realistic benchmarks for discharges too need to be established. The ones being used now were developed by The Sphere Project based on non HIV positive population and emergency setting. For comparison to be meaningful there is need to investigate and develop the sphere standards for outcomes of nutrition programmes associated with HIV.

- Advocate for decentralized procurement of supplies which can ensure timely distribution of those supplies. Districts could be entrusted to procure their own RUTF just like they do with all other medical supplies. Districts can therefore take full responsibilities of shortages and manage any leakage of the products while saving on time for delivery.
- Timely referral and integrated management of ailments need not to be emphasized. All medical and non medical problems experienced by clients need to be referred to professionals for immediate assistance. This can help curb the high incidences of the ailments.
- The meagre monthly income of the clients can be improved if the programme could initiate productive income generating activities that aim at increasing food access and protect livelihood. This can be done through farming, livestock keeping, small scale businesses and skill development.

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## Appendices

### Appendix 1: Clients' Perceptions on the NCST Programme

DESCRIPTOR	CLIENTS RESPONSES	STATISTICS (n =187)	
		Freq.	%
Reason for dissatisfaction about service providers	Kind and take time explaining	183	97.9
	Not conversant with what they want to say	3	1.6
	Cruel and impatient in explaining	1	.5
Reason for satisfaction with quality of food	Yes	183	97.9
Reason for satisfaction	well prepared/ well done	64	34.2
	Safe/ clean/ tested/ well wrapped/ hygienic/	61	32.6
	Rich in nutrients needed by the body	36	19.3
	Appetizing/ looks good/ smells nice	10	5.3
	soft, easy to swallow and portable	8	4.3
	Don't know	4	2.1
Reason for dissatisfaction with type of food	Don't just like it	4	2.1
Reason for satisfaction with type of food	Yes	177	94.7
	Improves health and nutrition status/ makes physically fit	74	39.6
	Has nutrients/ gives energy/ nutrient well mixed/ sorted out	52	27.8
	Delicious and brings satisfaction	24	12.8
	Does not require cooking/ convenient	14	7.5
	Tested/ safe and portable	4	2.1
	It can be tolerated/ no vomiting	3	1.6
	Like a drug or medicine/ better than CSB/	3	1.6
	It's what we deserve	3	1.6
	Reason for dissatisfaction with type of food	It just doesn't taste good	6
Too sweet and oily		2	1.1
Makes me vomit		1	.5
Too much salt		1	.5
Reason for enjoying the food	Yes	152	81.3
Reasons for not enjoying the food	Appetizing/ tasty/ brings satisfaction	80	42.8
	Ingredients are well mixed/ well prepared	62	33.2
	Tolerable	10	5.3
	Too sweet	21	11.2
Reason for dissatisfaction with amount	Too much salt and oil	11	5.9
	Makes me vomit	3	1.6
	Yes	172	92.0
Reason for satisfaction with amount	It is just enough/ good amount	85	45.5
	Consistent with prescription or protocols	47	25.1
	Takes us through to next date of appointment/caters all days	40	21.4
Reason for dissatisfaction with amount	Does not last up to the next appointment	8	4.3
	Body needs more/ inadequate	6	3.2
	Need for maize flour/ Corn Soya Blend	1	0.5
Experiences with transporting supplements	No	160	85.6
Problems associated with transporting food	Transport is expensive	13	7.0
	Problems with containers	8	4.3
	Too heavy	6	3.2
Ways of improving programme	Programme should continue and avoid stock out of RUTF	126	67.4
	Consider distributing other foods & basic necessities	25	13.4
	Intensify health education and community sensitization	13	7.0
	Decentralize to cater for long distances	12	6.4
	All ART clients should benefit from the programme	8	4.3
	Need to check the salt and oil content in RUTF	3	1.6

## Appendix 2: Health Workers Perceptions on the NCST Programme

ASPECT/THEME	HEALTH WORKERS' PERCEPTIONS/REMARKS
Programme inception	Most of the service providers managed to recall exact date and month when the programme started at their respective health facilities.
Objectives of programme	Some of the interviewed workers eloquently stated the objectives of the programme. The other three could not.
Programme target	Most of the KIs were able to recall the admission and discharge criteria of the clients from the programme without referring to the guidelines while the four could not.
Utilisation of NCST guidelines	Almost all service providers use the recommended NCST guidelines. Kangolwa Health Centre indicated that they admitted clients whose weight is <45kg and were discharged when their weight reaches $\geq 50$ kg.
Type of food distributed	All service providers indicated that they distributed RUTF (Sachet of 92g) from Valid International (VI) Malawi and at times from Project Peanut Butter (PPB). The clients were given RUTF based on the severity (grade) of malnutrition.
Ration determination	
Majority in programme	It was revealed that the proportion of the rural and low income (poor) women of reproductive age group was higher than any other category in the programme.
Reason why the majority	Majority of those who attended medical services (e.g. Voluntary testing) were women when compared to men, hence easily identified and recruited in the programme.
Utilisation of RUTF at home	Clients often ate the food directly from the sachets and occasionally through porridge and spreading on bread.
Mechanisms for preventing sharing of supplements	IEC (testimonies, sensitization, counseling and health education) was used to prevent the clients from sharing with the members of the household and others (including selling).
Length of stay in programme	About half of the service providers said that on average, the clients stayed in the programme for 3 months (90 days), two said 4 months (120 days) while remaining two said about 2 months (70 days) and 2-3 months respectively.
Stigma associated with RUTF	The RUTF sachets were associated with PLHIV except at Madisi Health Centre where the KI indicated that no stigma had been reported.

Service utilisation Hindrances	<p>The services were good, well patronized. However, the following were the common hindrances:</p> <ul style="list-style-type: none"> <li>• Low supply of food supplements</li> <li>• Sickness coupled with long distances to villages where clients came from</li> </ul>
Preparation for discharge	It was learnt that health and nutrition education on dietary diversity (fruit and vegetable gardens) was used to prepare clients for discharge in all facilities.
Availability of basic equipment, stationery and supplies (RUTF)	All facilities said they had basic equipment (bathroom scales and Stadiometers) by the time of study. About half of the facilities indicated that they had run out of stationery (register books, ration and counseling cards). Some facilities reported having had stock of RUTF, report forms and had no trained personnel.
Partnership (collaboration) Linkage and referrals	There were no site-level partners (NGOs) working in the field of nutrition. However, Mponela had an AIDS Counseling Centre where clients could access information on HIV/AIDS.
Supervision and feedback	<p>Almost indicated that there had been no district level supervision except two facilities, which indicated that supervision took place “sometimes” and twice a month. It was revealed that central level supervision too (from Nutrition Unit) took place “once in a while”.</p> <p>Of those facilities that were visited by supervisors, only Dowa DHO indicated that feedback was shared at national coordination meeting. Otherwise, they received feedback soon after supervisory visit.</p>
Recommendation	<p>For the programme to be able to fully meet its objectives, standards and expectations, the KIs suggested the following:</p> <ul style="list-style-type: none"> <li>• Train and deploy more nutritionists to provide technical skills to other supporting staff and clients.</li> <li>• More sites be opened to bring services close to people in remote areas.</li> <li>• Provide motorcycles for Nutrition programmes e.g. follow up, supervision in health facilities and cooking demonstration in villages.</li> <li>• Provide enough stationary, food supplements and equipment to nutritional sites.</li> <li>• Conduct exchange visits and share lessons learnt</li> </ul>

### Appendix 3: Strengths, Weaknesses, Opportunities and Threats in the NCST Programmes as Perceived by Senior Officers

STRENGTH	WEAKNESS
<ul style="list-style-type: none"> <li>• Commitment to support nutrition programmes by the OPC</li> <li>• Programme had support and confidence of stakeholders</li> <li>• The programme had adequate infrastructure and logistics.</li> <li>• Ability to treat malnutrition among adult males and adolescents who had been neglected in the past.</li> <li>• Existence of district and national level feedback forums, which were organized at intervals, provided room for sharing lessons learnt.</li> <li>• The programme had been integrated in already existing structures and provided an opportunity for sustainability.</li> <li>• The programme was recognized by donors and government this was likely to ensure support for its sustainability.</li> <li>• The programme had guidelines and training manual that could be used beyond the programme (by other agencies as well).</li> <li>• Availability of a basic package of health care and nutrition actions.</li> </ul>	<ul style="list-style-type: none"> <li>• Inadequate staffing (workload) and erratic supply of RUTF</li> <li>• Some NCST sites were in remote and in topographically difficult areas affecting logistics.</li> <li>• For some clients the RUTF was too sweet as such this negatively affected compliance to treatment protocols.</li> <li>• The training manual had not been aligned with the WHO recommendations especially on adolescents.</li> <li>• Absence of NCST data base</li> <li>• Delay in embracing technology (e.g. internet)</li> <li>• Unavailability of mechanism of monitoring effectiveness of some efforts especially trainings and field visits.</li> <li>• Technical staffs (clinicians and nurses) rarely took part in implementation of the nutrition components.</li> <li>• National level NCST coordination meetings did not engaged the DHOs like in programmes such as CTC activities.</li> <li>• Old equipment for anthropometry, which were rarely serviced.</li> </ul>

OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> <li>• Existence of network of volunteers in the community and gardens for CTC programme which could be used in NCST as well.</li> <li>• Presence of stakeholders created enabling environment.</li> <li>• Most Health facilities had storage facilities which could help in scaling up the programme.</li> <li>• Availability of staff at district level who were prepared to be trained if the programme was to be scaled up.</li> <li>• Assurance of stable funding for nutrition activities through SWAp since nutrition was in the Essential Health Care Package (EHP).</li> <li>• Recognition of the programme and subsequent inclusion of the same in the national nutrition policy.</li> <li>• The programme had accumulated a great deal of experience in what worked and what did not, which could help to improve its performance.</li> <li>• The programme could benefit greatly from the valuable recommendations made by some programme review exercises.</li> <li>• Local production of RUTF made it relatively cheaper.</li> <li>• Recognition that nutrition was multisectoral in nature, which in earlier years was considered a health sector issue.</li> </ul>	<ul style="list-style-type: none"> <li>• Supervision perceived by the health workers as fault finding and “policing”.</li> <li>• Staff turnover and workload.</li> <li>• Some clients experienced chronic food insecurity, worsened by unpredictable weather patterns which affect agricultural production and nutrition status.</li> <li>• Only few facilities offered this service in the district resulting in clients walking long distances.</li> <li>• Quality of services might have been compromised in terms of standards because of inadequate capacity.</li> <li>• Per Diem syndrome in most of the implementing staff.</li> <li>• Global financial crisis that could hamper implementation</li> <li>• Inconsistent reporting by implementing staff.</li> <li>• Poor quality of district level trainings. Training sessions took in many participants and also running for fewer days.</li> <li>• Lack of recognition that RUTF was part and parcel of the essential drug list</li> <li>• Risk of aflatoxins in some raw materials.</li> </ul>



## **Appendix 4: Admission and Discharge Criteria for Malnourished Adults on ART**

### **ADMISSION CRITERIA FOR ADULTS**

#### **Severe malnutrition**

BMI <16

**OR** Presence of bilateral oedema with MUAC <21.9cm (oedema should be assessed by a clinician for medical causes)

**OR** MUAC < 19cm (to be used only if BMI cannot be taken)

#### **Moderate malnutrition**

BMI 16-16.9

**OR** MUAC 19 - 21.9cm (to be used only if BMI cannot be taken)

#### **Pregnant and lactating women**

##### **Severe malnutrition**

MUAC <19cm

##### **Moderate malnutrition** (where SFP is not present)

MUAC 19 - 21.9cm

### **DISCHARGE CRITERIA**

#### **Adults**

BMI of 18.5

**AND** bilateral oedema has gone for 10 consecutive days

**OR** MUAC 23cm (to be used only if BMI can not be taken)

#### **Pregnant and lactating women up to 6 months after delivery**

MUAC 23cm

## Appendix 5: NCST Targets and Baseline Information

NAME OF INDICATOR	TARGET	PILOT STUDY	SOURCE
Cured rate	>75%	16 %	The Sphere Project(2004) Technical report AAH(2006)
Death rate	<10%	24%	
Defaulter rate	<15%	7%	
Length of stay for severe Length of stay for moderate	120 days 90 days		Malawi Government (2009)
Level of knowledge/skills of nutrition management of infections, conditions and drug side effects	50%		Malawi Government (2009)
Proportion of clients enrolled in nutrition care counseled per site	80%		Malawi Government (2009)
Drug adherence rates for ART clients	95%		Malawi Government (2009)

## Appendix 6: RUTF Nutrient Composition per 100g

NUTRIENT	CONTENT/100g
<b>Macronutrients</b>	
Energy (kj)	2281
Protein (g)	13.6
Lipids (g)	35.7
<b>Micronutrients</b>	
<b>Minerals</b>	
Potassium (mg)	1111
Calcium (mg)	320
Phosphorus (mg)	349
Magnesium (mg)	92
Zinc (mg)	14
Copper (mg)	1.8
Iodine ( $\mu\text{g}$ )	110
Selenium ( $\mu\text{g}$ )	30
Iron (mg)	11.5
<b>Vitamins</b>	
Thiamine (mg)	0.6
Riboflavin (mg)	1.8
Vitamin B6(mg)	0.6
Vitamin B12	1.8
Vitamin C (mg)	53
Folic acid ( $\mu\text{g}$ )	210
Niacin (mg)	5.3
Biotin ( $\mu\text{g}$ )	65
Pantothenic acid (mg)	3.1
Retinol ( $\mu\text{g}$ )	910
Vitamin D ( $\mu\text{g}$ )	16
Vitamin K ( $\mu\text{g}$ )	21
Vitamin E ( $\mu\text{g}$ )	20

Source: Diop *et al*, 2003

Appendix 7: Questionnaire for the Client

**MODULE A : IDENTIFICATION**

A1	Day/Month/Year of Interview / ___ / ___ / 2010	A4	Name of H. Facility.....
A2	District Name .....	A5	Enumerators code .....
A3	TA Name.....	A6	Supervisor code .....Sign.....

**MODULE B : DEMOGRAPHIC AND SOCIO-ECONOMIC CHARACTERISTICS**

B1	Name of the respondent	.....
B2	Age (in completed years)	/ ___ / ___ /
B3	Sex	Male .....1 Female .....2
B4	Marital Status of Respondent	Currently Married - monogamous.....1 Currently Married - polygamous.....2 Widowed.....3 Divorced.....4 Separated.....5 Single.....6

In answering B5 to B8 exclude visitors (< 2 weeks)

B5	Total Number of members in this HH	/ ___ / ___ /
B6	Total Number of children under 5 Yrs	/ ___ / ___ /
B7	Total Number of children 5 to 14 Yrs	/ ___ / ___ /
B8	Total Number of people 15 to older	/ ___ / ___ /
B9	Can the client read or write	Yes .....1 No.....2
B10	Level of Education of the client	Adult literacy.....1      Tertiary.....4 Primary .....2      University .....5 Secondary.....3      Never attended.....6 Other (Specify) .....7
B11	Client's Main Occupation	Farmer.....1      Employee.....6 Carpentry .....2      Casual labor.....7 Tailor.....3      Business.....8 Charcoal maker.....4      None.....9 Brick maker.....5      Other(specify)___10
B12	Household income per month	MK _____ / ___ /
B13	What is the client's main source of food?	Own Food Production.....1      Purchased Food.....5 Borrowed Food.....2      Food Gift.....6 Food Aid.....3      Ganyu.....7 Food for work.....4      Other (specify)___8
B14	Main Material of the dwelling floor?	Natural Floor: Earth/mud...1      Dung.....2 Finished Floor: Tiles.....3      Cement.....4 Carpet.....5

## MODULE C: HEALTH AND NUTRITION MOBILE

### Health: Water and Sanitation

C1	What is the main source of drinking water for members of your household?	Piped water in dwelling.....1 Public tap.....3 Protected dug well.....5 Rainwater collection.....7 Unprotected spring.....9 Tanker-truck, vendor.....11	Piped into yard or plot.....2 Borehole with pump.....4 Protected spring.....6 Unprotected dug well.....8 Pond, river or stream.....10 Other specify_____
C2	How long does it take to go there, get water, and come back?	No. Minutes..... Water on premises.....888 DK.....999	
C3	What kind of toilet facility does your household use?	Flush to sewage system.....1 Improved pit latrine (VIP)....3 Open pit.....5 No facilities or bush/field...7 If 7, ⇒ C5	Pour flush latrine.....2 Traditional pit latrine....4 Bucket.....6
C4	Is this facility located within your dwelling, or yard or compound?	Yes, in dwelling/yard/compound .....1 No, outside dwelling/yard/compound.....2	

### Health: Opportunistic infections and side effects of ARVs

C5	Drug regime	Lamivudine(3TC)/ Stavudine (d4T)/ Nevirapine (NVP) .....1 Lamivudine(3TC)/ Stavudine (d4T)/ Efavirenz (EFV) .....2 Other please state_____					
C6	Have you experienced any of the following symptoms since your last visit?	Nausea and vomiting .....1 Loss of taste.....2 Diarrhoea .....3 Constipation .....4 Oral thrush.....5	Fever.....6 Anorexia .....7 No symptoms experienced.8 If 8, ⇒ C11				
C7	If yes, for how long have you experienced these symptoms?	Symptom no _____ 1=<1 week 2=1-2 weeks 3=2-3 weeks 4=3-4 weeks 5=>1 month	Symptom no _____ 1=<1 week 2=1-2 weeks 3=2-3 weeks 4=3-4 weeks 5=>1 month	Symptom no _____ 1=<1 week 2=1-2 weeks 3=2-3 weeks 4=3-4 weeks 5=>1 month	Symptom no _____ 1=<1 week 2=1-2 weeks 3=2-3 weeks 4=3-4 weeks 5=>1 month	Symptom no _____ 1=<1 week 2=1-2 weeks 3=2-3 weeks 4=3-4 weeks 5=>1 month	Symptom no _____ 1=<1 week 2=1-2 weeks 3=2-3 weeks 4=3-4 weeks 5=>1 month
C8	How did you treat or control the symptoms experienced?	Ignore the symptoms.....1 See traditional healer.....2	See doctor and get medicine.....3 Dietary management.....4				
C9	Did you change your food habits to treat the symptoms?	Yes .....1 No.....2					
C10	Did the symptoms improve?	Yes .....1 No.....2					
C11	In the past month how often have you missed taking your medication	Never.....1 Sometimes.....3	Rarely.....2 Often.....4 If 1 ⇒ C13				
C12	If yes, what was the reason for missing taking your medication?	To avoid side effects.....1 Was experiencing side effects associated with the pills....2 Was experiencing side effects related to food received ...3 Other illnesses or health problem that came on the way..4					

### Nutrition: Adherence to nutrition treatment protocols

C13	Which type of food supplements are you receiving?	RUTF (Plumpy nut).....1 Likuni phala (Corn Soy Blend).....2	
C13a	How much ration in grams do you receive for a day?	/___/___//___/___/	
C13b	If yes, How often?	Daily...1      1-3 days a week....2      4-6 days a week....3	
C14	Of this ration, how much do you consume per day?	/___/___//___/___/	
C15	Have you ever shared your ration with any other person or household member?	Yes .....1 No.....2	2 ⇒ C17
C16	Main reason for sharing the ration with others	Household Food insecurity.....1 Too much for me.....2 Don't like organoleptic properties.....3 Others specify.....4	

### Nutrition: Weight Gain

C17	Date of admission or starting food supplement (Confirm with master card, register or other records)	/___/___/2010	
C18	Severity of malnutrition on admission	Severe.....1 Moderate.....2	
C19	Weight of the client on admission (Refer to register/ master card)	/___/___/	
C20a.	Current weight of the client (Weigh the client) Plus 2 recent weight measurements with dates	/___/___/___/ C20b./___/___/___/ C20c./___/___/___/ /___/___/2010      /___/___/2010      /___/___/2010	
C21	Weight gained in kg	/___/___//___/	
C22	Number of days the client has been in the programme since admission	/___/___//___/	

### Nutrition: Referrals and linkages

C23	Have ever been referred to other nutrition or health related services within or outside the hospital?	Yes .....1 No.....2	2 ⇒ C24
C24	Which programmes were you referred to?	Food security programmes.....1 Medical assistance.....2 PMTCT.....3 Other (specify) _____	

## Nutrition: Nutrition knowledge

C25	What are the six food groups for Malawi? (Enumerator tick as the respondent mentions the groups)	Animal products.....1 Fats and oils .....3 Fruit .....5	Legumes .....2 Vegetables.....4 Staples .....6	Yes....1 No.....2
C26	How many meals containing these groups do you normally eat in a day?	one .....1 two.....2 three .....3 four.....4 five .....5	more than five...6	
C27	How often do you snack between meals (includes fruit, nuts, cassava etc)	once a day .....1 three times a day .....3 five times a day .....5	twice a day .....2 four times a day.....4 more than five times a day .....6	
C28	What nutritional steps would you take to manage each of the following symptoms? (Enumerator tick only if the respondent mentions any of the following, you can tick more than one response)	Loss of appetite	Eat small and frequent meals .....1 Eat favorite foods.....2 Drink small slips of fluids.....3 Select foods that are rich in energy .....4 Avoid strong smelling foods if they negatively affect appetite. ....5 Don't know .....6	
C29		Change or loss of taste	Use flavour enhancers such as salt, spices or lemon.....1 Chew food well and move it around.....2 In mouth to stimulate receptors.....3 Clean mouth every morning .....4 Don't know .....5	
C30		Constipation	Eat foods high in fibre content such as whole cereals, fresh vegetables, fruits and beans....1 Drink plenty of liquids.....2 Avoid processed or refined foods.....3 Exercise regularly .....4 Don't know.....5	
C31		Fever	Drink plenty of fluids.....1 Don't know .....2	

**Nutrition: Nutrition knowledge cont'd**

C32	<p>What nutritional steps would you take to manage each of the following symptoms? (Enumerator tick only if the respondent mentions any of the following, you can tick more than one response)</p>	Diarrhoea	<p>Drink plenty of fluids.....1 Continue eating during and after illness.....2 Prepare and drink rehydration solution regularly. ....3 Avoid fried foods.....4 Don't know .....5</p>
C33		Nausea or vomiting	<p>Eat small and frequent meals .....1 Drink after meals and limit intake of fluids with meals .....2 Avoid having an empty stomach .....3 Avoid lying down immediately after eating ....4 Eat small salt quantities and dry foods to calm the stomach. ....5 Rest between meals. ....6 Don't know .....7</p>
C34		Dry mouth	<p>Avoid very hot foods, sweets, and drink with a lot of caffeine e.g. coffee, strong tea and sodas.....1 Rinse mouth with clean warm salty water .....2 Don't know .....3</p>
C35		Pale hands and fingernails (sign of anaemia)	<p>Eat foods like animal meats, dark green leafy vegetables like spinach and chisoso .....1 Increase the intake of fruits like oranges and mangoes after meals .....2 Reduce the intake of tea and coffee immediately after meals.....3 Take iron supplements, tablets or other formulations with advice from your medical doctor. ....4 Ensure you are treated for malaria and hookworms or other parasite .....5 Don't know.....6</p>
C36	Do you think that you should avoid any kinds of food	<p>Large amounts of sugar .....1      Alcohol .....2 Coffee .....3      Fried foods .....4 Fatty foods.....5      No need to avoid anything ...6 Don't know.....7</p>	



## MODULE D: PERCEPTIONS AND RECOMMENDATIONS

D1	What is your view about the service providers?	Kind and take time explaining.....1 Cruel and impatient in explaining.....2 Not conversant with what they want to say...3 Other (specify) _____4	
D2	Are you satisfied with the quality of food received?	Yes .....1 No.....2	
D3	If not or yes why?		
D4	Are you satisfied with the type of food received?	Yes .....1 No.....2	
D5	If not or yes why?		
D6	Do you enjoy the taste of the food you were given?	Yes .....1 No.....2	
D7	If not or yes why?		
D8	Are you satisfied with the amount of food received	Yes .....1 No.....2	
D9	If not or yes why?		
D10	Do you experience any problems in transporting the food from the clinic to your home	Yes .....1 No.....2	If 2 ⇒ D12
D11	If yes, why?	Too heavy .....1 Transport expensive.....3	Problems with containers...2 Others specify.....
D12	Do you encounter problems with the community because of the food that you are receiving?	Yes .....1 No.....2	If 2 ⇒ D14
D13	If yes, provide details?		
D14	How can this programme be improved?		

## Appendix 8: Key Informant Interview Guide

Date.....

Name of the respondent.....

Sex.....Age.....

Job title.....

Name of Health facility.....

- a. When did this NCST programme start at this institution? What are the objectives of the programme? Who does the programme target? Are you aware of the criteria? How do you determine those who are eligible for the programme? How often are guidelines used?
- b. What food supplement do you give? How do you determine how much a client gets?
- c. Who are the majority in the programme (probe by sex and age) and why? Where do most of the clients come from?
- d. How do the clients use the food supplements? How do you ensure that the food supplements are for the clients alone?
- e. For how long do the clients stay in the programme?
- f. Is there stigma associated with the ration?
- g. How are the clients using the services? What hinders clients to fully patronize the service?
- h. How do the clients prepare themselves for discharge considering that there is no supplementary feeding programme for the adult programme?
- i. How many of the following do you have at this NCST site:
  - Supplements: RUTF, Equipment: Scales, Stadiometers,
  - Stationery: NCST guidelines, registers, ration cards, report forms, counseling cards, and trained personnel at the site?
- j. Do you have partners working in the field of nutrition and health in this area? Are the clients referred to this or these programmes for continuum of care?
- k. How often do you receive central level supervisors? And the district level supervisors? Do you receive feedback after the supervisory visit?
- l. What considerations do you think the programme should make:
  - Before starting the programme, during implementation and before phasing out?
- m. How would you want the programme to run in order to fully meet its objectives, standards and expectations?

## Appendix 9: Focus Group Discussion Question Guide

**Date**.....

**Overview of the respondents**.....

**Name of Health facility**.....

- a. What food supplement do the clients receive? How often do they come to collect the ration? Can some one else collect ration on their behalf?
- b. Why would a client send someone else to collect ration on their behalf?
- c. How do the clients use the food supplements at home? How long does the food supplement last?
- d. How do the clients ensure that the food supplements are for them and them alone?
- e. Has the food supplement benefited the clients? If no why not?
- f. Have counseling sessions benefited clients? If no why not?
- g. Who are the majority in the programme (prove by age and sex) and why? Where do most of the clients come from?
- h. Is there stigma associated with the ration?
- i. How do you find the services? What hinders clients to fully patronize the service?
- j. How important is this programme?
- k. How are the clients getting prepared for discharge considering that there is no supplementary feeding programme for the adult programme after discharge?
- l. What are the objectives of NCST programme?
- m. In your opinion, do you think the programme is addressing and meeting the intended objectives?
- n. How would you want the programme to run in order to fully meet its objectives, standards and expectations?

## Appendix 10: SWOT Analysis Question Guide

Date.....

Overview of respondents.....

Name of Health facility.....

This tool will guide the facilitator and recorder to identify Strengths (S), Weaknesses (W), Opportunities (O) and Threats (T). Below are questions to ask under each item:

### Strengths

- a. What advantages does the programme have?
- b. What assets and resources does the programme have?
- c. What do members of staff/clients identify as the programme's strengths?
- d. What do you think are the strengths of the programme?

### Weaknesses

- a. What is the programme being criticized for?
- b. What complaints are you receiving about the programme?
- c. What impedes implementation of the programme?
- d. What is that you think needs perfecting?
- e. Where do you think the programme is vulnerable?
- f. What do you think are the weaknesses of the programme?

### Opportunities

- a. What opportunities does the programme have that have not been explored?
- b. What available resources have not been put to maximum use?
- c. Does the programme have any opportunities it can capitalize on?

### Threats

- a. Are there weaknesses likely to make the programme critically vulnerable?
- b. What external roadblocks exist that block the programmes progress?
- c. Are the environmental or economic conditions affecting program's success?
- d. What do you think are the threats of the programme?

**Appendix 11: Template for Retrospective Data**

NAME OF DISTRICT:								NAME OF HEALTH FACILITY:										
NAME OF ENUMERATOR:								NAME AND CONTACTS OF HEALTH WORKER:										
MONTH AND YEAR	ADMISSIONS							TOTAL ADMISSION	EXITS					TOTAL EXITS	MEAN LOS		NUMBER OF CLIENTS	
	TOTAL START OF MONTH	BMI <16.9	BMI 16.9-19.9	MUAC <19cm	MUAC 19-21.9 plus OEDEMA	OEDEMA	MUAC 19-21.9cm		CURED	DEATHS	DEFAULTERS	TRANSFERS	NON RESPONDERS		SEVERE	MODERATE	SEVERE	MODERATE
Jul-09																		
Aug-09																		
Sep-09																		
Oct-09																		
Nov-09																		
Dec-09																		
Jan-10																		
Feb-10																		
Mar-10																		
Apr-10																		
May-10																		
Jun-10																		
TOTAL																		

## Appendix 12: Training Programme

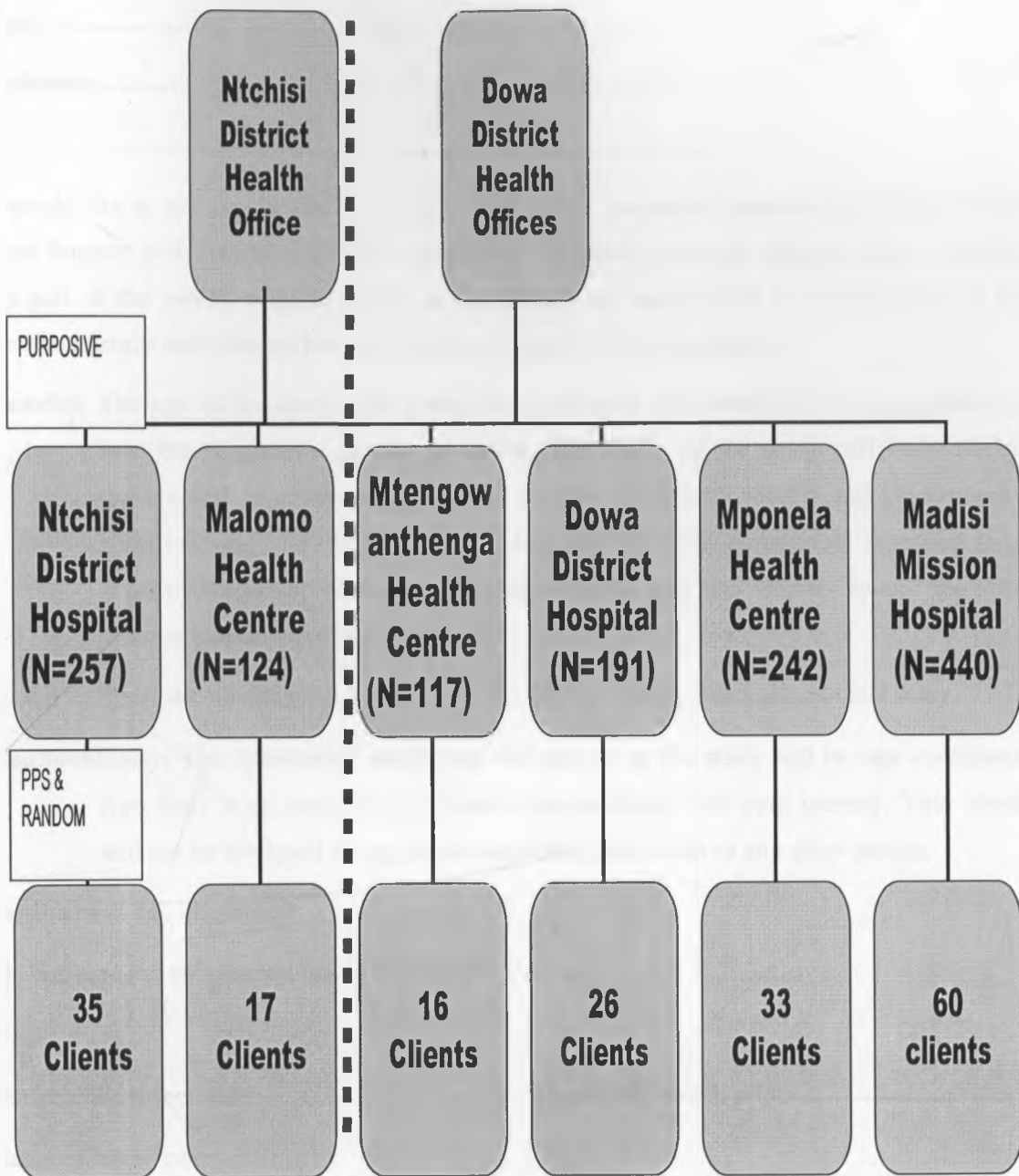
<b>DAY ONE</b>				
<b>Time</b>	<b>Activity (and content or subject matter)</b>	<b>Teaching methods</b>	<b>Teaching Aids</b>	<b>Facilitator</b>
8:30-9:00	Opening remarks and Introduction	Lecture	Written speech	Principal Investigator
9:00-9:30	Logistics and housekeeping issues	Brainstorming	Flip chart, markers	Principal Investigator
9:30-10:00	Study title, aim, purpose and objectives of the study	Lecture	LCD Projector Laptop, slides	Principal Investigator
<b>10:00-10:30</b>	<b>Tea Break</b>			<b>30 minutes</b>
10:30-12:00	Discussing Questionnaire and translation	Discussion	Questionnaire (copies)	Principal Investigator
<b>12:00-1:30</b>	<b>Lunch</b>			<b>1:30 hr</b>
1:30-3:30	Discussing Questionnaire and translation Interviewing techniques.	Role play Demonstration	Copies of questionnaire	Principal Investigator
<b>3:30-4:00</b>	<b>Tea Break</b>			<b>30 minutes</b>
<b>4.00-4.30</b>	Focus Group Discussion Guide: Questions, coding and recording	Discussion Question and Answer Lecture	Copies of FGD guide LCD Projector Laptop, slides	Principal Investigator

<b>DAY TWO</b>				
<b>Time</b>	<b>Activity</b>	<b>Teaching methods</b>	<b>Teaching Aids</b>	<b>Facilitator</b>
8:30-10:30	Asking questions in English and translation in Chichewa Interviewing and facilitation techniques	Role play Demonstration	Copies of FGD guide	Principal Investigator
<b>10:30-11:00</b>	<b>Tea Break</b>			<b>30 minutes</b>
11:00-12:00	Key Informant Guide: Questions, coding and recording	Discussion, Lecture & Question and Answer	Copies of KI guide LCD Projector Laptop, slides	Principal Investigator
<b>12:00-1:30</b>	<b>Lunch</b>			<b>1:30 hr</b>
1:30-3.00	Interviewing techniques. Asking questions in English and translation in Chichewa	Role play Demonstration	Copies of KI guide	Principal Investigator
3.00-3.30	<b>Tea Break</b>			<b>30 minutes</b>
3:30-5:30	SWOT guide: Asking questions in English and translation in Chichewa  Interviewing and facilitation techniques.	Discussion, Lecture & Question and Answer  Role play Demonstration	Copies of SWOT guide  Copies of SWOT guide	Principal Investigator  Principal Investigator

<b>DAY THREE</b>				
<b>Time</b>	<b>Activity</b>	<b>Teaching methods</b>	<b>Teaching Aids</b>	<b>Facilitator</b>
8:30-10:30	Tool for the retrospective data  Sampling	Practical exercise  Practical exercise	Copies of template, pencils, Calculators, , rubber, eraser Handout, Previous experience	Principal Investigator  Principal Investigator
<b>10:30-11:00</b>	<b>Tea Break</b>			<b>30 minutes</b>
11:00-12:00	Entry process and creating rapport Principles of research ethics	Brainstorming Question and Answer	Handout Previous experiences	Principal Investigator
<b>12:00-1:00</b>	<b>Lunch</b>			<b>1:30 hr</b>
1:00-3.00	Pre-testing tools	Field exercise	Tools and materials	All
3.00-3.30	<b>Tea Break plus</b> and Pre-testing tools	Field exercise	Tools and materials	All
3.30-5:00	Debriefing and corrections	Brainstorming Discussion	Pre-tested tools Field experiences	All
5.00-5:30	Formation and allocation of survey teams Facilitator and supervisor meeting	Discussion	Pre-tested tools	Principal Investigator



**Appendix 13: Overview of Sampling of Respondents**



**Appendix 14: Informed Consent Form**

**REQUEST FOR CONSENT TO PARTICIPATE IN NCST EVALUATION STUDY**

**Name of client:** .....

**Age:** .....**Sex:** .....

**Address:** .....

.....

I would like to ask you to allow the study team to ask you some questions regarding Nutrition Care Support and Treatment (NCST) programme in which you were enrolled some weeks ago. As part of the survey, eligible people in the district are being asked to provide some of their personal details and information about the performance of the programme.

**Benefits:** The aim of the study is to assess the programme and determine recommendations on how the programme can be improved. The results of the study will assist decision makers and programme planners at Ministry of Health (MoH) and Department of Nutrition and HIV/AIDS (DNHA) to come up with appropriate response to the shortfalls in the programme. The improvements will also directly benefit the clients who are enrolled in this programme.

**Risks:** There are no risks associated with your full or partial participation in this study.

**Confidentiality:** The information which you will give us in this study will be kept confidential. And there is no way this information can be linked with your identity. Your identity will not be disclosed in any public reports or publication or any other parties.

Do you have any questions?

Do you agree to be a respondent in this study? Yes: ..... No: .....

Date: .....

Name of the respondent: ..... Signature/Thumb print: .....

Name of Interviewer: ..... Signature: .....

**CHICHEWA**

**KUPEMPHA CHILOLEZO CHOTI MUPANGENAWO KAFUKUFUKU**

**Dzina** :.....

**Zaka** :.....

**Amuna or Akazi** :.....

**Malo okhala** :.....

Ngati gawo kapena mbali imodzi ya kafukufuku wathuyu tikupempha anthu m'boma lino la .....(Dowa/Ntchisi) kuti atithandize kudziwa za m'mene programme ya chiponde cha akulu ikuyendera. Tizapempha kuti tiziwe zinthu zina zokhozana ndi moyo wanu komanso ziza ndi zina zokhuza momwe pologalamu ikuyendera.

Dziwani kuti palibe vuto lina lililonse limene lingabwere chifukwa choti inu mwatengapo mbali mukafukufuku uyu.

Zotsatira za kafukufuku uyu zizathandiza unduna wa zaumoyo komanso offesi ya pulezidenti ndi kabineti, ija yoonza za matenda a HIV ndi EDZI ndi kadyedwe kabwino kuti athe kukonzanso bwino polopalamuyi, potero pologalamuyi izatha kuthandiza anthu bwino ndi moyera.

Dziwani kuti zonse inu mutiuze zokhuza inu konanso pologalamuyi tidzisunga mwachinsinsi.

Kodi muli ndi funso pa pankhaniyi ?

Kodi muvomera kutengapo mbali pa kafukufukuyu? Inde:..... Ayi:.....Tsiku: .....

Dzina la ofunsa mafunso: ..... Signature/Thumb print: .....

Dzina la oyankha mafunso: ..... Signature/Thumb print:

.....

**Appendix 15: Referral Form**

**REFERRAL FORM**

Dear Doctor/Health Care Provider,

\_\_\_\_\_ (Name) \_\_\_\_\_ has voluntarily participated in the study on 'Evaluation of Nutrition Care, Support and Treatment (NCST)'. The objective of the study is to assess the performance of the NCST programme. Although, no thorough medical assessment was conducted on the respondent, but clinical signs were used to determine the respondent's nutritional and medical conditions. Considering the following clinical signs presented by the respondent:

.....  
.....we feel the respondent could have a nutrition or medical problem requiring diagnosis.

This initial clinical assessment was not and is not intended to be a substitute for a visit to you at \_\_\_\_\_ (name of hospital) \_\_\_\_\_, nor for a complete clinical examination. No attempt has been made by our study team to diagnose or treat medical conditions of the respondent. The respondent is hereby referred to you so that s/he can be further evaluated and treated.

Sincerely yours,

Name of Interviewer: .....

Signature: .....

Date : .....

**KALATA YOTUMIZIRA ANTHU KU CHIPATALA**

DATE:

Okondeka a Dokotala,

A \_\_\_\_\_ (Name) ndi m'modzi mwa anthu omwe atenganawo gawo pa kafukufuku wa chiponde cha anthu akulu akulu [Nutrition, Care Support and Treatment (NCST) programme]. Cholinga chakafukufuku ameneyu ndikufuna kudziwa momwe pologalamu imeneyi ikuyendera kuno ku .....(Dowa/Ntchisi). Pogwira ntchito imeneyi, tinagwirizana kuti anthu amene akuoneka ngati ali ndi mavuto ena m'nthupi mwawo azathe kutumizidwa ku chipatala kuti akapimidwe mwasatanesatane. Zizindikiro ngati .....  
ndizofunika kuti maiwa/bambowa apimidwe ndi dokotala.

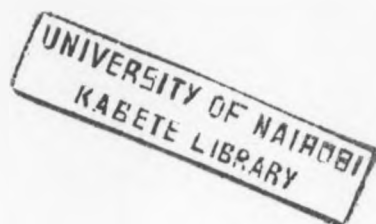
Cholinga chakafukufukuyu sikuletsa anthu kubwera kuchipatala chanu cha \_\_\_\_\_ (Name of hospital) kuti adzayezedwe mokwanira. Ngakhale tinatha kuona zizindikiro tatchulazo, sitinathe kufufuza kuti maiwa/bambowa ali ndi matenda anji kotero kafukufukuyu sanapereke mankhwala aliwonse. Koma takutumizirani maiwa/bambowa kuti mumuthandize mokwanira.

Zikomo.

Name of Interviewer: .....

Signature: .....

Date : .....



## Appendix 16: Ethical Clearance

Telephone: + 265 789 400  
Facsimile: + 265 789 431

All Communications should be addressed to:  
The Secretary for Health and Population



In reply please quote No. MED/4/36c  
MINISTRY OF HEALTH AND POPULATION  
P.O. BOX 30377  
LILONGWE 3  
MALAWI

11<sup>TH</sup> October 2010

**Kumbukani Chirwa**  
University of Nairobi

Dear Sir/Madam,

**Re: Protocol # 757: "Performance of the nutrition care, support and treatment (NCST) programme for malnourished HIV clients on ART: The Case of Dowa District**

Thank you for the above titled proposal that you submitted to the National Health Sciences Research Committee (NHSRC) for review.

Please be advised that the NHSRC reviewed and **approved** the proposed amendments of the study to include Ntchisi district.

Kind regards from the Secretariat.

A handwritten signature in black ink, appearing to be 'W. J.' or similar, written over a dotted line.

**FOR: CHAIRMAN, NATIONAL HEALTH SCIENCES  
RESEARCH COMMITTEE**