

# Evaluation of the Outpatient Therapeutic Programme for Management of Severe Acute Malnutrition in Three Districts of Eastern Province, Zambia

Mike Mwanza

**Student Number: 2616606**

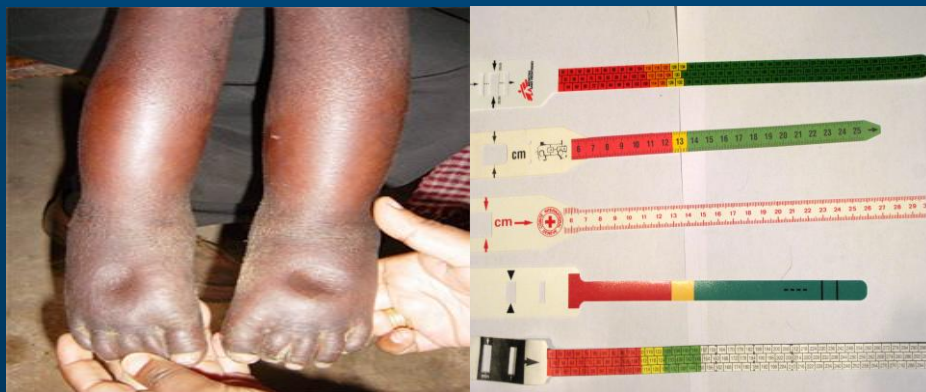
A Mini-thesis submitted in partial fulfillment of the requirements for the degree of Masters in Public Health (MPH) in the School of Public Health,

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Republic of South Africa

Supervisor: Professor Thandi Puoane

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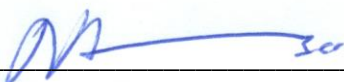


## Declaration

I declare that *An Evaluation of the Outpatient Therapeutic Programme (OTP) for Management of Severe Acute Malnutrition (IMAM) in Three Districts of Eastern Province, Zambia* is my own work, that it has not been submitted before for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged as a complete references.



Mike Mwanza

Signed:  \_\_\_\_\_

**28<sup>th</sup> February, 2013**

## Dedication

I dedicate this work to my parents (Mr and Mrs. James.Malumbe.Mwanza) for guidance they gave me which has always directed me in the right path in life and to my lovely wife Mrs. Justina Banda Mwanza and my children (Angela and Mike Mwanza Jnr) for the encouragement and support rendered during the writing of this Mini-thesis.



## Acknowledgement

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I would like to thank the Ministry of Health Headquarters, the Provincial Medical Office in Eastern province, Zambia and the District Medical Offices in Chipata, Katete and Petauke for allowing me to collect data from the three Outpatient Therapeutic Programme Centres.

Special thanks go to all the Outpatient Therapeutic Programme Centre staff, District Outpatient Therapeutic Centre Staff and District Medical Office staff for participating in the study. I would also like to pay tribute to Mr. Belem Matapo of World Health Organisation for his invariable input during data processing.

I am also indebted to Mr. Bruce Chinyama Kapata the Senior Education Standards Officer at the Provincial Education Office in Central province, Zambia for editing my Mini - thesis.

Finally, I would like to appreciate the guidance provided to me by Professor Thandi Puoane my supervisor at the University of the Western Cape throughout the process of writing this Mini-thesis.

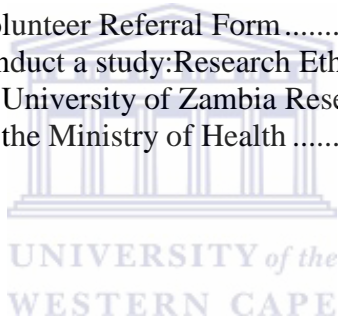


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## ABBREVIATIONS

ACC/SCN	Administrative Committee on Coordination/Subcommittee on Nutrition
ACF	Active Case Finding
AIDS	Acquired Immune Deficiency Syndrome
CFR	Case Fatality Rate
CI	Confidence Interval
CSO	Central Statistical Office
CV	Community Volunteer
DMO	District Medical Office
FSP	Food Security Pack
GMP	Growth Monitoring and Promotion
HW	Health Worker
HIV	Human Immuno Deficiency Virus
IMAM	Integrated Management of Acute Malnutrition
ITP	Inpatient Therapeutic
IYCF	Moderate Acute Malnutrition
MDG's	Millennium Development Goals
MoAL	Ministry of Agriculture and Livestock
MoCDMCH Health	Ministry of Community Development Mother & Child
MoH	Ministry of Health
MUAC	Mid Upper Circumference
NFNC	National Food and Nutrition Commission
NGO	Non-Governmental Organization
OTP	Outpatient Therapeutic Programme
PEM	Protein Energy Malnutrition
PMO	Provincial Medical Officer
RHC	Rural Health Centre
RUTF	Ready to Use Therapeutic Food
SAM	Severe Acute Malnutrition
SFP	Supplementary Feeding Programme
TFC	Therapeutic Feeding Centre
UNICEF	United Nations Children's Fund
UNSCN	United Nations Standing Committee for Nutrition
UNZABREC	University of Zambia Biomedical Research Ethics Committee
UWC	University of the Western Cape
VI	Valid International
WHO	World Health Organization
WFP	World Food Programme
ZDHS	Zambia Demographic and Health Survey

## Definition of Terms

**Evaluation:** A process of data collection design to assess the effectiveness of the project in attaining its originally – stated objectives, and the extent to which observed changes are attributable to the project.

**Inpatient Therapeutic Programme:** Health facilities that manage children presenting with the most complicated form of Severe Acute Malnutrition (SAM), treat infection and correct micronutrient imbalances using the World Health Organization (WHO) protocols

**Integrated Management of Acute Malnutrition:** An innovation for treating severe acute malnutrition without medical complications at health facility and at community level using Ready to Use Therapeutic Food (RUTF)

**Monitoring:** The collection and review of information on project implementation, coverage and utilisation of inputs

**Out Patient Therapeutic Programme:** Facilities that manage SAM without medical complications as outpatients; clients visit the Outpatient Therapeutic Programme Centre weekly for nutrition and medical assessments and collection of RUTF.

**Programme Outcomes:** Desired programme results (Recovery, mortality and defaulter rates, average weight gain and average length of stay in the Outpatient Therapeutic Programme

**Ready to Use Therapeutic Food:** An energy dense mineral / vitamin enriched food specifically designed to treat severe acute malnutrition. It is equivalent in formulation to Formula 100 which is recommended for treating severe acute malnutrition.

**Severe Acute Malnutrition:** it is characterized by one of the following;

- Weight-for Height measurement below -3 Z-Score below the median Weight for Height compared to the Reference population
- Weight for Height below 70 % of the median compared to the Reference population
- Mid-Upper Arm Circumference measurement below 11.5 cm
- The presence of bilateral pitting oedema

## Abstract

### **Evaluation of the Outpatient Therapeutic Programme (OTP) for Management of Severe Acute Malnutrition (SAM) in Three Districts of Eastern Province, Zambia**

Mike Mwanza

**Master's in Public Health (MPH) Mini-Thesis, School of Public Health, University of the Western Cape, Republic of South Africa**

**Background:** The Outpatient Therapeutic Programme (OTP) is an integrated public health innovation for treating severe acute malnutrition without medical complications in children 6 to 59 months of age as outpatients within their communities using Ready to Use Therapeutic Food with the aim of reducing case fatality rates. The OTP approach is implemented in the three districts in Eastern Province of Zambia namely; Chipata, Katete and Petauke. Since inception of the OTP in the province, an evaluation of the OTP has not been conducted. The study is aimed at assessing the effectiveness of the implementation of the OTP for management of severe acute malnutrition in the three districts of Eastern Province of Zambia.

**Methodology:** A cross sectional study with a positivist approach was used and records of children admitted in the Outpatient Therapeutic Programme (OTP records) between first September 2008 and 30<sup>th</sup> August 2010 were reviewed. Interviews were done with Outpatient Therapeutic Programme Centre and District staff, and District Medical Office staff to obtain information on knowledge and practices of staff implementing the Outpatient Therapeutic Programme. Data was entered, cleaned and processed using Epi Info Version 3.5.3 to calculate frequency, mean and cross tabulations. Permission to conduct this study was obtained from the Research Ethics Committee of the University of the Western Cape and the University of Zambia, the Ministry of Health and the District Medical Offices in the three districts. Participants signed consent forms after information about the study and the rights to refuse to participate or to withdraw from the study any time without giving reasons were provided.



**Results:** The study demonstrated that children with severe acute malnutrition without medical complications can be successfully treated in Outpatient Therapeutic Programme because about 80 % of children who were treated in the Outpatient Therapeutic Programme recovered on discharge, about 2.8 % died and about 17.2 % were absent for three consecutive weeks in the Outpatient Therapeutic Programme (defaulted). The OTP outcomes (Recovery and death rates) were above the internationally accepted Minimum Sphere Standards for Therapeutic Feeding Centres of above 75 % and less than 5 % respectively except for defaulter rate (17.2 %) which was below the internationally acceptable Minimum Sphere Standards for Therapeutic Feeding Centres of less than 15 %. Defaulter rate was not within the acceptable Minimum Sphere Standards for Therapeutic Feeding Centres hence the need to establish the status of defaulters.

There was a high Community volunteer dropout in the Outpatient Therapeutic Programme due to lack of motivation and this affected the implementation of Outpatient Therapeutic Programme activities. The Outpatient Therapeutic Programme Centre staff reported that feedback on monitoring by the district Outpatient Therapeutic Programme staff was not adequately shared to the Outpatient Therapeutic Programme Centre staff. Also reported was consistency in stock outs of Ready to Use Therapeutic Food, drugs and supplies at Outpatient Therapeutic Programme Centres. Outpatient Therapeutic Programme linkage with health and livelihood programmes was also weak; meanwhile it was reported that Outpatient Therapeutic Programme centre staff planned OTP activities in their annual action plan to sustain Outpatient Therapeutic Programme implementation.

**Conclusion:** Outpatient management of severe acute malnutrition without medical complications is effective in reducing case fatality rates and improving health outcomes (Recovery and mortality rates, average weight gain and average length of stay in Outpatient Therapeutic Programme) when compared with internationally accepted Minimum Sphere Standards for Therapeutic Feeding Centres. The high defaulter rate (17.2 %) which was not within the recommended Minimum Sphere Standards for Therapeutic Feeding Centres presents a challenge with Outpatient Therapeutic Programme acceptability and accessibility hence the need to determine if those that defaulted recovered.



It is therefore recommended that the Outpatient Therapeutic Programme approach must be scaled up within the three districts and within the province. The district medical offices in the programme areas must conduct a defaulter tracing study to determine the status of defaulters, develop a sustainable uniform package for motivating Community volunteers in the Outpatient Therapeutic Programme with the aim of reducing Community volunteer drop out and must ensure that Ready to Use Therapeutic Food, drugs and supplies are in constant supply to avoid stock outs. The Outpatient Therapeutic Programme should be integrated and linked to curative, preventive, promotive child survival and livelihood programmes to maximize coverage and resource leverage. It is also recommended that the Outpatient Therapeutic Programme should be integrated into the pre and in-service trainings of health professionals training institutions and in refresher training of community health extension workers



# Chapter One: Introduction



# Chapter One

## 1.0 Introduction

Experts in economic development have debated on how to drastically empower people to participate in development in their own communities in a sustainable way. One plausible strategy to this problem is the implementation of Integrated Management of Acute Malnutrition (IMAM) approach which is dependent on high levels of community participation and mobilisation. (Chaiken, Deconinck & Degefie, 2006). Integrated Management of Acute Malnutrition approach is interchangeably used as Community-based Therapeutic Care or Community Management of Acute Malnutrition. The IMAM approach has been implemented in numerous contexts where severe acute malnutrition is prevalent. The IMAM approach consists of four components namely; Inpatient Therapeutic Programme, Outpatient Therapeutic Programme, Supplementary Feeding Programme and Community Mobilisation.

This Mini - thesis reports on an evaluation of the Outpatient Therapeutic Programme for IMAM approach implemented by the Provincial Medical Office (PMO) in Eastern Province with technical and financial support from the National Food and Nutrition Commission (NFNC), Valid International (VI) and United Nations Children's Fund (UNICEF). The three districts implementing the Outpatient Therapeutic Programme in Eastern Province are Chipata, Katete and Petauke.

## 1.1 Programme Description - Outpatient Therapeutic Programme

The advent of advances in dietary management of children with severe acute malnutrition has replaced the practice of long hospital treatment until wasting and / or oedema has resolved by shorter hospital stay combined with Outpatient Therapeutic Programme (Brewster, D.R, 2006). The Outpatient Therapeutic Programme (OTP) is an innovation for treating severe acute malnutrition without medical complications in children 6 to 59 months of age as outpatients within their communities using Ready to Use Therapeutic Food with the aim of reducing case fatality rates in the OTP Collins, Dent, Binns, Bahwere, Sandler & Hallam, 2006).

The OTP is integrated into the Primary Health Care system within the Ministry of Health. In the OTP, Community volunteers and Health workers identify children 6 – 59 months of age with severe acute malnutrition using the Mid-Upper-Arm Circumference tape and screening for bilateral pitting oedema within their communities and health facilities. Children found to have Mid-Upper-Arm Circumference < 11.5 cm or with bilateral pitting oedema are referred to the OTP for further screening. Those found with severe acute malnutrition with medical complications are referred to the Inpatient Therapeutic Programme while those with moderate acute malnutrition without medical complications are referred to the Supplementary Feeding Programme.

In the OTP, those children who miss a weekly session are followed up and if they do not attend the OTP sessions on three consecutive weeks, they are considered to have defaulted. In the OTP, apart from bilateral pitting oedema, the use of the Mid-Upper-Arm Circumference is the sole anthropometric indicator for screening and admission into the programme since it is a good predictor of mortality (Myatt, Khara & Collins, 2006).

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The objectives of the OTP are to: increase the number of children 6 – 59 months of age with good weight gain (5–10 g / kg body weight / day), reduce length of stay of children in the OTP to < 60 days; reduce defaulter rate to < 15 % by December 2010 and to reduce case fatality rates due to severe acute malnutrition to < 10 % by December 2010. The benefits of the OTP are timely detection of severe acute malnutrition in children 6 - 59 months of age in communities by mass screening using Mid-Upper-Arm Circumference tapes and checking for bilateral pitting oedema (WHO, WFP, UNSCN & UNICEF, 2007).

In the OTP, children with severe acute malnutrition without medical complications receive 200 kcal / kg / day take home ration of Ready to Use Therapeutic Food, a course of oral broad – spectrum antibiotics, Vitamin A, and Folic acid, Anthelmintic and in some cases Antimalarial drugs (Collins *et al*, 2006).

Before the initial implementation of the OTP, baseline data was not collected for the OTP but six months later OTP outcomes (Recovery, death and defaulter rates, and average length of stay and average weight gain) were collected. As part of monitoring of the OTP implementation, performance outcome indicators were collected weekly and an aggregated report was compiled on a monthly basis.

The three Rural Health Centers (RHCs) that piloted the OTP in the province are; Muzeyi RHC in Chipata, Kafumbwe RHC in Katete and Msanzala RHC in Petauke district. Currently, Outpatient Therapeutic Programme is on-going in the three Rural Health Centers. Table 1 below shows the admission criteria for children with severe acute malnutrition in the Outpatient Therapeutic Programme.

**Table 1: Outpatient Therapeutic Programme Admission Criteria**

Outpatient Therapeutic Programme Admission Criteria	
	Criteria
New admissions	Bilateral pitting oedema grade + or ++ <b>OR</b>
	Children 6-59 months: MUAC < 11.5cm
	<b>AND</b> Child is alert, has an <u>appetite</u> for RUTF, and is clinically well (i.e. <u>no medical complications</u> )
Special case admissions	Twins < 5 years where one twin has SAM *
Transfer from ITP	From inpatient care (ITP) after stabilisation treatment
Transfer from OTP	Patient moved in from another OTP site
Transfer from SFP	Patient has either not responded to treatment in SFP (i.e. no weight gain) or the condition has deteriorated in the SFP (i.e. loss of weight after two consecutive visits )

Adapted from the draft Version: National Guidelines for Integrated Management of Acute Malnutrition

## 1.2 Global Problem of Malnutrition

Malnutrition in children < 5 years of age remains a major public health problem especially in developing countries (Collins *et al*, 2006); globally, about 60 million children < 5 years of age suffer from moderate acute malnutrition while about 20 million children of the same age group suffer from severe acute malnutrition. The majority of children < 5 years of age affected with severe acute malnutrition are found in South Asia and Sub-Sahara Africa (WHO *et al*, 2007). A review on management of severe acute malnutrition in children < 5 years of age indicated that 9 % of Sub - Saharan Africa and

15 % of South Asian children suffer from moderate acute malnutrition while about 2 % of the children in the same age group in developing countries are severely malnourished (Collins *et al*, 2006). Severe Acute Malnutrition across Africa affects about 3 % of children < 5 years of age and it is linked to high child mortality rates and for those who manage to survive to the age of six, the world is a threatening place (UNICEF.1995, as cited by El – Ghannam, 2003). Currently, a new innovation in treating over 85 % of children with severe acute malnutrition solely as outpatients has significantly reduced child mortality and increased programme coverage (Briend, A & Collins, S, 2010).

Malnutrition is an underlying cause of more than 50 % of the 10 million child mortality that occur throughout the world. Malnourished children often die from preventable diseases such as diarrhoea and respiratory infections (Black, Morris & Bryce, 2003; Grobler - T.C & Collins. S, 2004). Furthermore, approximately one million children under five years of age die every year from severe acute malnutrition (WHO, 2007 *et al*). A study conducted on the effects of malnutrition on child mortality in developing countries reported that 56 % of child mortality was due to severe acute malnutrition (Pelletier, Frongillo, Schroeder, & Habicht, 1995).

### **1.3 Malnutrition in Children as a Public Health Problem in Zambia**

In Zambia about 45 % of children < 5 years of age are stunted, 5 % are wasted and 15 % are underweight (CSO *et al*, 2009). These are all above the World Health Organisation recommended levels requiring action which are 40 % for stunting, 5 % for wasting and 10 % for underweight (CSO *et al*, 2009). In addition, 53 % of Zambian children < 5 years of age have Vitamin A deficiency, 46 % have Iron deficiency anaemia (NFNC, 2003) and 9 % are born with low birth weight (< 2.5 kg) indicating poor maternal nutrition (CSO *et al*, 2009). The 2007 Zambia Demographic and Health Survey (ZDHS) further revealed that infant, child and < 5 mortality rates were at 70 deaths per 1,000 live births, 52 deaths per 1,000 live births and 119 live deaths per 1,000 births respectively (CSO *et al*, 2009).

In 1998, a study on mortality in severe acute malnutrition in children < 5 years of age admitted at St Paul's Hospital in Nchelenge district in Zambia reported overall mortality

at 25.8 % with 13.4 % for Kwashiorkor, 17.8 % for Marasmus and 28 % for Marasmic kwashiorkor (Gernaat, Dechering & Voorhoere, 1998) hence the need for specialized treatment to reduce mortality (Collins *et al*, 2006). Another study conducted on case fatality rates (CFR) due to severe acute malnutrition in Zambian hospitals in 2006 reported 31 % mortality in children with severe acute malnutrition (NFNC, 2006) therefore it is cardinal to have specialized treatment in order to reduce mortality in children due to poor case management (Collins *et al*, 2006). In addition, studies revealed that severe acute malnutrition was the commonest reason for paediatric hospital admission in many poor countries, meanwhile 25 to 30 % of children with severe acute malnutrition died during hospital admissions (Khanum, S., 2005). Table 2 shows malnutrition trends in Zambia from 1992 – 2007.

**Table 2: Malnutrition Trends in Zambia, 1992 - 2012**

Type of malnutrition	1992	1996	2001/02	2007
Stunting	46%	49%	53%	45%
Underweight	21%	19%	23%	15%
Wasting	6%	5%	6%	5%

Source, CSO *et al* (2007). Zambia Demographic and Health Survey

#### 1.4 Malnutrition Problem in Eastern Province of Zambia

Eastern Province is situated in eastern part of Zambia. It consists of eight districts with a population of 1,685,882 of which 20 % are children < 5 years of age. The population distribution for the three districts where the OTP was piloted in the province were; 458,700, 233,582 and 315,812 for Chipata, Katete and Petauke respectively (MoH, 2007). The prevalence of malnutrition in children < 5 years of age in the province was at 49.5 % stunting, 3.6 % wasting, 1.3 % severe acute malnutrition and 12.7 % underweight (CSO *et al*, 2009). Table 3 shows malnutrition trends from 1992 to 2007 in Eastern province.

**Table 3: Malnutrition Trends in Eastern Province: 1992 - 2007**

Type of malnutrition	1992	1996	2001/02	2007
Stunting	48%	48%	59%	50%
Underweight	25%	26%	32%	13%
Wasting	3%	3%	5%	4%

Source, CSO *et al* (1992, 1996, 2001/02, 2007). Zambia Demographic and Health Survey

A report on Active Case Finding (ACF) for severe acute malnutrition in Eastern Province estimated severe acute malnutrition at 3.1 % (Valid International, NFNC & UNICEF, 2008). The Zambia Demographic Health Survey (ZDHS) of 2007 reported that infant and children < 5 mortality rates in the province were at 82 and 151 deaths per 1,000 births respectively. Table 4 shows the expected cases of severe acute malnutrition in the Outpatient Therapeutic Programme Centres in Eastern Province in Zambia.

**Table 4: List of Outpatient Therapeutic Centres**

District	Total Population	Total SAM Cases Expected (3.1%)	Outpatient Therapeutic Programme Centres	Total Population	Total SAM Expected (3.1%)
Chipata	473,682	2,644	Muzeyi	34, 836	194
Katete	240,421	1,342	Kafumbwe	14, 167	76
Peatuke	324,221	1,809	Msanzala	6, 374	36

Source, UNICEF, NFNC & Valid International (2008)

Although agriculture is a major livelihood in the province; drought has negatively affected agriculture production thus contributing to food insecurity. The districts in the province included nutrition as a priority health problem in their district annual action plans for 2008 to 2010 (MoH, 2007).

## 1.5 Research Problem

Since inception of the Outpatient Therapeutic Programme (OTP) in Eastern Province in 2008, an evaluation has not been conducted. This evaluation is conducted in order to determine the effectiveness of the OTP performance outcomes as well as to track progress for attainment of programme objectives. The findings of the evaluation will assist OTP staff in identifying areas which perform well and those areas that require attention.

## 1.6 Justification

High mortality in children < 5 years of age with severe acute malnutrition is attributed to poor case management (Collins *et al*, 2006); the Outpatient Therapeutic Programme (OTP) if well implemented reduces case fatality rates (WHO *et al*, 2007). A review meeting on OTP six months after inception identified challenges in implementation



which included inadequate adherence to protocols and low recruitment of clients. After the review meeting, OTP monitoring was strengthened to redress the situation. This justified why an evaluation of the OTP was conducted to document learning experiences to assist OTP managers on areas that needed improvement.

### **1.7 Significance of the Study**

Management of children, 6 - 59 months of age with severe acute malnutrition in communities is a new innovation which needed to be evaluated in order to determine programme effectiveness. The study findings will fill the knowledge gap of Outpatient Therapeutic Programme (OTP) staff and stakeholders in management of children with severe acute malnutrition aged 6 - 59 months in the OTP. The findings will also be used for policy implementation and programming during the scaling up of OTP to enhance efficiency and effectiveness.



# Chapter Two: Literature Review



## Chapter Two

### 2.0 Literature Review

#### 2.1 Burden of Malnutrition in Children

Malnutrition is classified as under or over nutrition, in developing countries, it is often referred to as under nutrition which represent “ *an imbalance between the supply of protein and energy and the body’s demand for them to ensure optima growth and function* ” (De Onis, M. & Blossner, M, 1997).

Under nutrition includes Protein Energy Malnutrition (PEM) and micronutrient deficiencies. There is a link between malnutrition and child mortality as a result of compromised immunity (Black *et al*, 2003). About 53 % of all deaths in children < 5 years of age were attributed to severe acute malnutrition and about 27 % of children of the same age group in developing countries in 2005 were stunted with the highest levels in Africa at 35 % while wasting was at 8 % (Caulfield, De Onis, Blossner, & Black, 2004; Roy, Rahman, Mitra, Ali, Alam, & Akbar. 1993). Chopra and Sanders, 1997; Badenhorst *et al*, 1993 reported that malnourished children experience greater morbidity and mortality from measles, diarrhea and other infectious diseases (Chopra, M., & Sanders. D, 1997; Badenhorst *et al*, 1993).

The relationship among undernutrition, child mortality, and infection was recognized by anthropologists that “hunger does not kill, it is sickness that kills” (Shipton. P, 1990). The 5<sup>th</sup> Report on the UN Sub-Committee for Nutrition (UNSCN) recognize adequate nutrition as a basic requirement for social and economic progress and also emphasized the need to reduce severe acute malnutrition in order to achieve the Millennium Development Goals (MDGs) (ACC/SCN, 2004). The chances of attaining the 4<sup>th</sup> MDG of two third reductions in childhood mortality is only possible if severe acute malnutrition is addressed effectively (Collins *et al*, 2006).

Zambia is experiencing high levels of malnutrition in children < 5 years of age and it is unlikely that it will attain the 4<sup>th</sup> MDGs. Protein Energy Malnutrition in children can be

detected by anthropometric measurements and through physical examination. Anthropometric measurements detects child's nutritional status and predicts a child's growth retardation resulting from body wasting, which indicates recent weight loss (De Onis, M., 2000).

## **2.2 Severe Acute Malnutrition**

Severe Acute Malnutrition (SAM) is defined as severe wasting (Weight for Height  $< -3$  Z Score or  $< 70$  % of the Median National Centre for Health Statistics / WHO Reference) and / or the presence of nutritional oedema or Mid-Upper-Arm Circumference  $< 11.5$  cm in children 6 – 59 months of age (Collins *et al*, 2006). About 20 million children  $< 5$  years of age suffer from SAM, the majority are in South Asia and Sub Saharan Africa (WHO *et al*, 2007) and about one and half million child mortality per year is attributed to SAM as estimated by United Nations Children's Fund global database (Collins *et al*, 2006). The majority of malnutrition related mortality occur in moderately malnourished children but the risk of death is greater in children with SAM, they are 8.4 times more likely to die from infections while moderately malnourished children have 4.6 times more likely to die than well-nourished children (Pelletier *et al*, 1995).

Malnutrition has a synergistic relationship with infection; malnourished children are more susceptible to infections, and the infections worsen poor nutritional status (Scrimshaw. N.S, 2003). Literature revealed that SAM is the main reason for paediatric hospital admission in developing countries (Collins *et al*, 2006; Khanum, 2005); about 25 – 30 % of children with SAM die during hospital admissions (Khanum, 2005). In the general population wasting has remained steady over the years. Zambia is currently experiencing very high and unacceptable neonatal, infant, child and  $< 5$  mortality rates which are estimated at 34, 70, 52 and 119 per live births respectively (Central Statistical Office *et al*, 2009).

As defined by Mid-Upper-Arm Circumference (MUAC)  $< 11.5$  cm, literature revealed that there is a higher proportion of death attributed to severe acute malnutrition among children 6 – 59 months of age as tabulated in table 5.

**Table 5: Proportion of Deaths Attributed to Severe Acute Malnutrition**

Place	Proportion of deaths (%)
Bangladesh	24.9
Bangladesh	19.1
Bangladesh	33.1
N Malawi	6.7
SW Uganda	16.7
Senegal	10.2

Source: Briend Andre: (2005)

The MUAC tape is a good and easy tool for detecting severe acute malnutrition in children 6 – 59 months of age since it is sensitive to rapid weight loss in children with severe acute malnutrition (Ministry of Health, 2012). It is also a good tool for predicting risk of mortality; the lower the reading the higher the risk of mortality in children. The MUAC tape can easily be used by Community volunteers to screen children with severe acute malnutrition in the community. Another way of detecting severe acute malnutrition by Community volunteers is by screening for bilateral pitting oedema which is always on both feet. Unlike the MUAC tape, detection of oedema is taken for children 0 – 59 months of age.

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### **2.3 Causes of Severe Acute Malnutrition**

A UNICEF conceptual framework of undernutrition assists in analysing causes of nutrition problems. It has been used in developing most appropriate nutrition interventions (UNICEF, 1990). The framework categorise causes of malnutrition into immediate, underlying and basic causes. The immediate causes are diseases and inadequate dietary intake while the underlying causes are inadequate household food security, inadequate maternal and child care, insufficient health services and unhealthy environment. The basic causes are related to political, social and economic factors. The causes of severe acute malnutrition in children are complex but notable ones are due to, poor quality diet, insufficient nutrient intake, poverty, frequent infectious disease, poor access to health services and unhygienic living conditions (De Onis, M & Blossner, M, 1997; Obaid.T.A, 2004). Malnutrition is directly related to poverty and illiteracy (Collins *et al*, 2006), poor access to health services including reproductive health care (Obaid,

2004). Studies revealed that limited access to nutritious food, poor water and sanitation conditions increase the risk of frequency of infections (WHO *et al*, 2007).

Children who survive from poor childhood growth suffer from short term consequences such as compromised brain development and retarded growth throughout their life cycle resulting in a vicious cycle. The cycle contribute to a poverty trap with massive negative consequences on the development of the country since communities have poor nutritional status, poor labour production and too vulnerable to disease (Obaid.T.A, 2004:7). The main causes of severe acute malnutrition in Eastern province are childhood infections; diarrhoea, malaria and pneumonia. The province is experiencing high levels of childhood diseases that led to severe acute malnutrition due to poor water, sanitation and environment compounded with inadequate health structure (MoH, 2007). Figure 1 shows the UNICEF Conceptual framework for under nutrition.

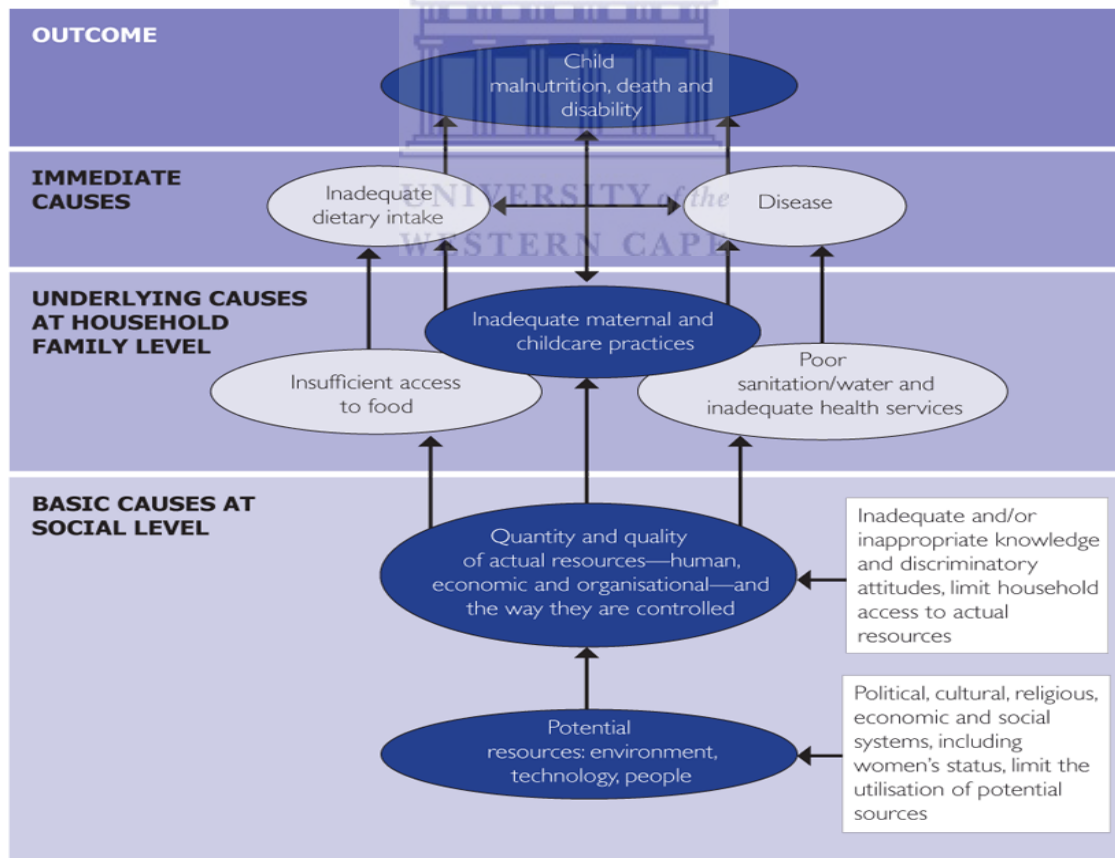


Figure 1: UNICEF Conceptual Framework of Under nutrition

## **2.4 Management of Severe Acute Malnutrition**

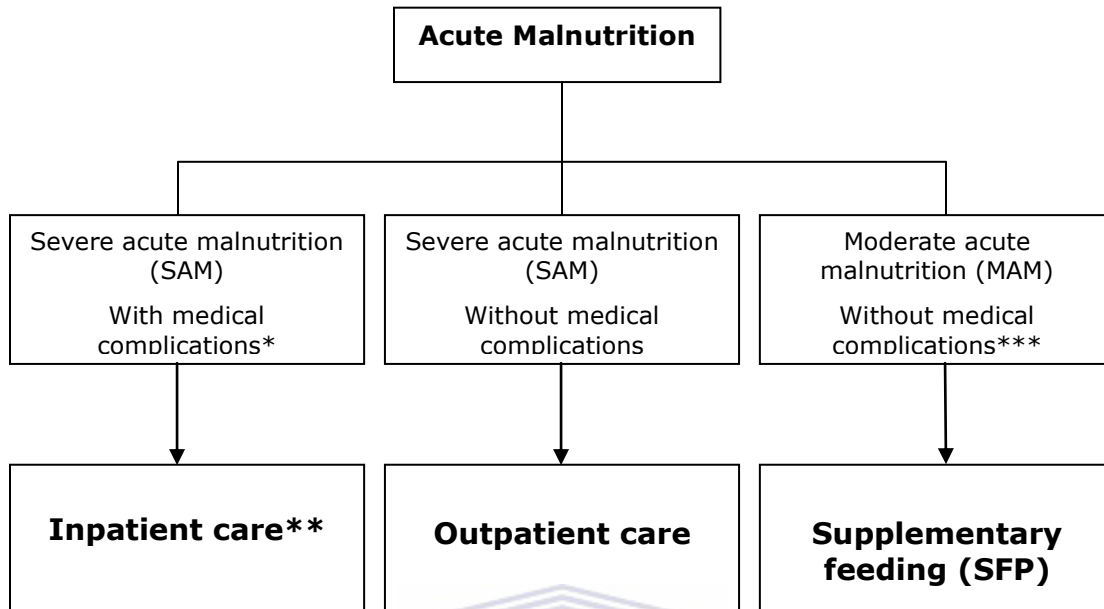
Until recently, most interventions to reduce severe acute malnutrition (SAM) were inpatient facility based through Therapeutic Feeding Centres (TFCs) and Supplementary Feeding Programme. The Therapeutic Feeding Centres as a strategy for management of severe acute malnutrition in children 6 – 59 months encountered challenges such as; limited coverage and impact (WHO *et al*, 2007), high expenditure, centralisation, increased risk of cross infection and longer stay of caregivers in health facilities (Collins, 2004). Cases of severe acute malnutrition were identified at the Outpatient department through Integrated Management of Childhood Illness approach and those that required extra care were referred to the TFC for specialised treatment.

Currently, children 6 – 59 months of age with severe acute malnutrition are treated using the World Health Organisation guidelines for management of severe acute malnutrition and in Outpatient Therapeutic Programme Centres, a new robust approach known as Integrated Management of Acute Malnutrition approach (Valid International *et al*, 2008). The Integrated Management of Acute Malnutrition approach was endorsed at the 55<sup>th</sup> World Health Assembly in May 2002 as a global strategy for Infant and Young Child Feeding (IYCF) which recommends active case finding of severe acute malnutrition in infants and children for early management in order to prevent high case fatality rates due to severe acute malnutrition (WHO *et al*, 2007).

## **2.5 Classifications of Severe Acute Malnutrition**

Recent literature indicated lapses in management of severe acute malnutrition due to inadequate knowledge by Health workers and this has contributed to high case fatality rates (Collins *et al*, 2006). In order to reduce case fatality rates due to severe acute malnutrition, capacity building in Integrated Management of Acute Malnutrition approach to compliment the World Health Organisation guidelines for management of severe acute malnutrition is vital. Figure: 2 Shows the classification of severe acute malnutrition used in Integrated Management of Acute Malnutrition approach.

## Classification of Acute Malnutrition in Integrated Management of Acute Malnutrition



*Adapted from FANTA, 2008*

**Figure 2: Classification of Severe Acute Malnutrition**

*\*Medical complications include severe bilateral pitting oedema, Marasmic kwashiorkor, anorexia, intractable vomiting, convulsions, and lethargy or not alert unconsciousness, lower respiratory tract infection, high fever, severe dehydration, severe anemia, hypoglycemia and hypothermia.*

*\*\*Others admitted to inpatient care are: infants < 6 months with severe acute malnutrition, children > 6 months of age who weigh < 4 kg, and children with severe acute malnutrition in Outpatient Therapeutic Programme care who are losing weight or have static weight for five weeks.*

*\*\*\* Children with moderate acute malnutrition and medical complications are admitted to Supplementary Feeding Programmes in the emergency context and receive food rations, but are referred for medical treatment and return to SFP when medical complications are resolved.*

## 2.6 Integrated Management of Acute Malnutrition

The Integrated Management of Acute Malnutrition (IMAM) approach is entrenched in public health principles and it is based on the sociological, epidemiological and food technology aspects of interventions (Collins *et al*, 2006). The IMAM approach provides a structure that connects interventions that already exist, to achieve high impact at population level (Khara.T & Collins. S, 2004). It uses contemporary treatment procedure and improved access to treatment thereby reducing the case fatality rates to as low as 5 % in both community and health facilities (WHO *et al*, 2007), it is therefore imperative for the country to implement the IMAM approach to compliment efforts of Inpatient Therapeutic Programme in treatment of severe acute malnutrition.



Literature has also shown that IMAM approach is an effective and cheaper way of managing children with severe acute malnutrition without medical complications (Valid International, 2006). In IMAM approach, children with severe acute malnutrition without medical complications are treated with Ready to Use Therapeutic Food at home and visit the Outpatient Therapeutic Programme once in a week for clinical and nutritional monitoring (Collins, S, 2004) while those children with severe acute malnutrition and having medical complications are treated in Inpatient Therapeutic Programme using the World Health Organisation guidelines for management of severe acute malnutrition.

A study undertaken by Collins & Sadler in Ethiopia reported that IMAM approach was an effective way of managing children with severe acute malnutrition without medical complications using Ready to Use Therapeutic Food as outpatients with an aim of reducing case fatality rates (Collins, S & Sadler, K, 2002). A retrospective cohort study conducted in Ethiopia reported 85 % recovery rate, 4.7 % defaulter rate and 4.5 % death rate well above the Minimum Sphere Standards for Therapeutic Feeding Centres (Collins, S & Sadler, K, 2002). A descriptive case study conducted in the same area to compare the effectiveness of IMAM approach in combination with conventional treatments for severe acute malnutrition also reported high recovery rates of 66 %, defaulter rates at 2.3 % and death rate at 0.2 %. The recovery rate was lower than the recommended Minimum Sphere Standards for Therapeutic Feeding Centres but both defaulter and death rates were above the Minimum Sphere Standards for Therapeutic Feeding Centres (Chaiken *et al*, 2006). The authors attributed the difference in results to the study design used, a cohort study had a small sample size, accurate data and adequate resources while the case control study had limited resources for a large population hence data may have been inaccurate (Chaiken *et al*, 2006).

A study conducted by Collins *et al*, 2002 reported that more than 25 % of children with Marasmus in the Outpatient Therapeutic Programme, gained weight faster (8g / kg /d) when they received recommended amount of Ready to Use Therapeutic Food. It was also suggested that oedematous children weight gain should be interpreted with care to account for the loss of oedema fluid (Collins, S & Sadler, K, 2002). In the Outpatient

Therapeutic Programme, acceptable weight gain and length of stay suggested that the programme had been accepted by the community and there was also an element of adherence to the protocol. The thrust of the IMAM approach was community participation in early case identification in communities and referral to the health facilities for management. Meanwhile, scaling up of the Outpatient Therapeutic Programme would be valuable if the already implementing facilities were evaluated and lessons learnt were applied to new sites. The four components of IMAM types of treatment and target groups are shown in Table 6 below.

**Table 6: Components of IMAM and Different Types of Treatments and Target Groups**

Components	Treatment sites	Target group	Description
<b>Inpatient Therapeutic Programme (ITP)</b>	Inpatient hospital paediatric ward, Stabilisation Centre	Children with SAM or MAM without appetite and/or with medical Complications	Provides inpatient care to patients with SAM or MAM with complications until the patients are stabilised and fit for outpatient treatment.
<b>Outpatient Therapeutic Programme (OTP)</b>	Health Posts Health centres Hospitals Anti-Retroviral Therapy (ART) centres	Children with SAM and with appetite and no complications.	Treats with RUTF and systematic medications. These are taken at home and the child attends an OTP site weekly for check-up and re-supply of RUTF. About (80 %) of severe malnourished children can be treated in the OTP.
<b>Supplementary Feeding Programme (SFP)</b>	Health Posts Health centres Hospitals ART Centres	Children with moderate and mild acute malnutrition.	Where available, provides take-home rations to moderately and mildly acute malnourished children
<b>Community mobilisation</b>	Health facility and community level	Community and children	Sensitize and mobilize the community. Enables early case finding, referral, and follow-up of children with SAM.

Adapted from the draft National Guidelines for Integrated Management of Acute Malnutrition

In IMAM, admission criteria are based on the admission protocol on Table 7 below.

**Table 7: Severe Medical Complications in Outpatient Therapeutic Programme**

Severe Complication	How to Identify It
Oedema +++	Bilateral pitting oedema
Anorexia (lack of appetite)	Perform appetite test
Intractable (uncontrolled) vomiting	The child presents sudden vomiting, and cannot retain food/drinks
Fever >39 °C or hypothermia < 35 °C	Use thermometer and measure for at least 1 minute.
Lower respiratory tract infection	Always count respirations for at least 1 minute. ≥ 60 respirations/min for children under 2 months

	<p>≥ 50 respirations /min for children 2 – 11 months          ≥ 40 respirations /min for children 12 – 59 months          ≥ 30 respirations /min for children ≥ 5 years          OR any chest in-drawing.</p>
Severe anaemia	Check palms are very pale– compare with a healthy child. If unclear, check conjunctiva or nail beds.
Extensive skin infection	Examine the child without clothes for skin infection or lesions and ask the mother for any other severe infection.
Severe dehydration	Recent history of profuse watery diarrhea, fever, vomiting or sweating and recent change in child's appearance <sup>1</sup>
Very weak, apathetic, unconscious, convulsions	<p>Observe child's attitude. Child is difficult to wake. Ask the mother if the child is drowsy, shows no interest in what is happening around him/her, does not look at the mother or watch her face when talking, or is unusually sleepy.</p> <p>Ask the mother about convulsions: the child has uncontrollable movements of limbs and/or face, and/or rolling eyes and/or loss of consciousness.</p>
Hypoglycaemia	A clinical sign in a child with SAM is eye-lid retraction: the child sleeps with the eyes slightly open

## 2.7 The Importance of Integrated Management of Acute Malnutrition

The Integrated Management of Acute Malnutrition (IMAM) approach provides numerous benefits at all levels of implementation since it uses and builds up on existing capacities thereby helping to empower communities to deal with similar situations (Collins, 2004). The approach has advantages of timely detection of severe acute malnutrition in the community (WHO *et al*, 2007; Collins, 2004) and provides treatment for those children with severe acute malnutrition without medical complications using Ready to Use Therapeutic Food (Collins, 2004). Since the IMAM approach is conducted within communities, it readily provides the services closer to the people in a participatory mode. The approach can easily be integrated in other sectorial programmes such as HIV/AIDS, Growth Monitoring and Promotion (GMP), hygiene and food security interventions without difficulty. According to literature, Outpatient Therapeutic Programme management of children 6 – 59 months of age with severe acute malnutrition without medical complications can attain high coverage in affected communities and can be very

effective in treating severe acute malnutrition Collins (2004). In Zambia, IMAM was started in 2005 in Lusaka district in 25 health facilities and it was later scaled up to Eastern province in three districts namely Chipata, Katete and Petauke. (Valid International *et al*, 2008).

## **2.8 Inpatient Management of Severe Acute Malnutrition**

Until recently, children with severe acute malnutrition were treated in Inpatient Therapeutic Programme (ITP) using World Health Organization (WHO) guidelines for management of severe acute malnutrition which focused on initial phase of stabilization (WHO, 1999; Collins *et al*, 2006) The oversight of ITP for management of severe acute malnutrition was its limited coverage and impact (WHO *et al*, 2007) and increased risk of cross infection, longer stay of care givers in hospitals, high expenditure and centralization (Collins.S, 2004). Studies reported severe acute malnutrition as a major cause of mortality among pediatric hospitals in developing countries (Puoane *et al*, 2006) and approximately 30 % of children with severe acute malnutrition died due to poor case management (Schofield, C. & Ashworth, A, 1996). Studies have also reported that mortality in children with severe acute malnutrition was highest within the first 48 hours of admission suggesting that cases were admitted when they were in a very bad state. The presentation of cases late to hospitals was an indication of late identification and poor referral system in the programme (Deen, Funk, Guevera, Doe, Palmer & Weber, 2003).

In Zambia, case fatality rates for children with severe acute malnutrition in hospitals was at 31 % in 2006 which is far much above the 5 % acceptable rate for World Health Organization (NFNC, 2006) comparable to what Schofield & Ashworth reported (Schofield *et al*, 1996). The adherence to World Health Organization protocols on management of severe acute malnutrition reduced mortality in Inpatient Therapeutic Programme to as low as 10 % (Wilkinson, Scrace & Boyd, 1996). It was observed that once children with severe acute malnutrition were referred for treatment early, the length of stay in ITP was reduced to < 60 days as recommended in the Minimum Sphere Standards for Therapeutic Feeding Centres (Bernal, Velasquez, Alcaraz, & Botero, 2008). Meanwhile, ITP according to the WHO guidelines recommends that a patient who is

wasted should be admitted in hospital until wasting is resolved and this could take about three weeks (WHO, 1999).

According to Collins, Dent, Banwere, Sadler and Hamer (2006) the length of stay in hospitals for severe acute malnutrition cases could be reduced if care givers rehabilitate their children at home and visit the health facility once a week after appropriate education is provided since most of them come from poor families. Studies conducted in Outpatient Therapeutic Programme managing severe acute malnutrition reported that cure rate was low while mortality and defaulter rates were high compared to the Minimum Sphere Standards for Therapeutic Feeding Centres; meanwhile, weight gain was higher than in the other programmes managing severe acute malnutrition (Collins, S, 2001).

## 2.9 Minimum Standards in Evaluating Outpatient Therapeutic Programmes

The Minimum Sphere Standards are a set of internationally accepted guidelines used in emergencies to improve the quality of service provision and to ensure accountability during calamities (The Sphere Project, 2004). The key indicators for measuring the performance of Outpatient Therapeutic Programme (OTP) are; average weight gain of  $\geq 8\text{g / kg / child / day}$ , recovery rate of  $> 75\%$ , defaulter rate of  $< 15\%$ , average length of stay in the OTP of  $< 60$  days and mortality rate of  $< 10\%$ . The development of the Integrated Management of Acute Malnutrition approach necessitated the need to revise the indicators in the Minimum Sphere Standards to suit the OTP (Valid International Zambia & Concern Worldwide, 2006). Table 8 shows the internationally recommended Minimum Sphere Standards for Therapeutic Feeding Programmes.

**Table 8: Minimum Sphere Standards for Therapeutic Programme**

Programme outcome indicators (SPHERE 2011)		
Indicator	ITP/OTP	SFP
Recovered	$> 75\%$	$> 75\%$
Defaulted	$< 15\%$	$< 15\%$
Died	$< 10\%*$	$< 3\%$

Source: The Sphere Project (2011)

*\*with good functioning referral system to Inpatient Therapeutic Programme the mortality rate in Outpatient Therapeutic Programme should be much lower than 10 %!*

**Additionally, other indicator can be used, such as**

- Rate of weight gain is 8-10 g / kg / day in Outpatient Therapeutic Programme
- Length of stay to recover of 40-60 days in Outpatient Therapeutic Programme

The following indicators are used for the monitoring reports:

The total numbers of discharged individuals is made up of all who have recovered, died, defaulted or are non-recovered.

■ Proportion of discharged children that are RECOVERED at end of month =  
$$\frac{\text{Number of children RECOVERED at end of month}}{\text{Total number of discharged at end of month}} \times 100 \text{ per cent}$$

■ Proportion of discharged children that DEFAULTED at end of month =  
$$\frac{\text{Number of children DEFAULTED at end of month}}{\text{Total number of discharged at end of month}} \times 100 \text{ per cent}$$

■ Proportion of discharged children that DIED at end of month =  
$$\frac{\text{Number of children DIED at end of month}}{\text{Total number of discharged at end of month}} \times 100 \text{ per cent}$$

■ Average daily weight gain: average daily weight gain over the period in the nutrition intervention.

• For *wasted* children =  
$$\frac{[(\text{discharge weight (gram)} - \text{admission weight (grams)})]}{\text{admission weight (kg)} \times \text{number of days between admission and discharge}}$$

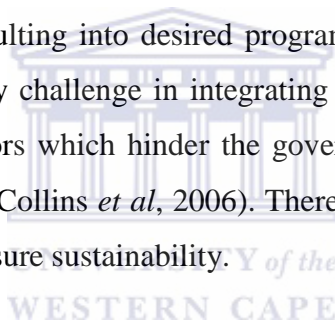
For *oedematous* cases =  
$$\frac{[(\text{discharge weight (gram)} - \text{minimum weight (gram)})]}{\text{Admission weight (kg)} \times \text{number of days between minimum weight and discharge}}$$

## **2.10 Factors Affecting Implementation of Nutrition Programmes**

Implementation of nutrition programmes depends on availability of a working health system in order to achieve the desired programme outcomes. Some of the factors that affect the implementation of nutrition programmes are described below:

### **2.10.1 Financial Resources**

Sanders (1999) suggested that for nutrition programmes to be sustainable, internal and reliable funding was required. It is therefore vital to provide adequate funding for nutrition programmes to execute activities effectively. Anecdotal reports indicated that if Health workers and Community volunteers were empowered with skills and knowledge and if; supplies and equipment were available, nutrition programmes could face less implementation challenges resulting into desired programme outcomes. Stakeholders in nutrition observed that one key challenge in integrating nutrition programmes has been short- term funding from donors which hinder the government to build capacity of the Primary Health Care services (Collins *et al*, 2006). There is need for government to plan for nutrition programmes to ensure sustainability.



### **2.10.2 Human Resources**

Human resource is vital for smooth implementation of programmes. The availability of adequate, highly motivated and skilled staff contributes to the effectiveness in implementation of nutrition programmes (Collins *et al*, 2006). Literature has shown that the attainment of the Millennium Development Goals of a two third reduction in childhood mortality and improvements in health outcomes is essential but skilled human resource is a challenge (World Bank, 2004). In Zambia, health facilities are understaffed and in rural areas, untrained Health workers operate them. The shortage of trained staff and use of untrained staff has a negative effect on sustainable programme implementation



### **2.10.3 Capacity Building**

The Health workers (HWs) and Community volunteers (CVs) must be equipped with skills and knowledge on programme monitoring and implementation in order to achieve desirable programme outcomes (WHO *et al*, 2007). It is prudent for HWs and CVs to undergo refresher courses regularly for programme updates. Capacity building of staff promotes sustainability in nutrition programming (Gatchell, Forsythe & Thomas, 2006). It is worth noting that training of HWs in nutrition programmes requires national planning and support so that they are incorporated into existing medical and nursing curricula of health training institutions (Collins *et al*, 2006).

Evidence has shown that once HWs are trained and provided with necessary equipment, there is a change in the way they perceive severe acute malnutrition thus having a better understanding on how to manage it (Ashworth, Chopra, McCoy, Sanders, Jackson, Karaolis, & Sogaula, 2004; Puoane, Sanders, Ashworth, Chopra, Strasser & McCoy 2004). Studies have also revealed that supervising trained HWs with the view of them adhering to standardized protocols is directly associated with a major reduction in case fatality rates in children with severe acute malnutrition (Biai.Rodrigues, Gomes, Ribeiro, Sodemann, Alves & Aaby (2007).

### **10.2.4 Community Mobilisation and Sensitisation**

The success of community programmes depends on the quality of engagement with the target communities. Anthropological studies revealed that people did not understand the bio–medical model when developing community based programmes hence they use traditional practitioners for treatment of ailments (Guerrero, S, Myatt, M, Collins, S, 2009). Community mobilisation can be referred to as “*the range of activities that assist implementers understand the affected communities, build relationships with them and foster their participation in programme activities*” (Collins *et al*, 2006). It is vital for programmes to be implemented in a sustainable approach at community level by linking them to health services within the health system (Gatchell *et al*, 2006).



### **2.10.5 Community Volunteers**

Implementation of community programmes depends on community mobilisation which is conducted by Community volunteers (CVs). Anecdote reports on CVs indicated that there is a higher dropout of CVs participating in health programmes. It was also observed that CVs were motivated by cash, food or transport and in some cases through workshops while others were not.

### **2.10.6 Programme Linkages**

Community programmes provide a setting for linkages with nutrition and food security programmes. The design of the programmes should integrate curative and preventive care to reduce malnutrition and to improve public health and food security in affected areas by taking into account the socioeconomic factors especially poverty and high workload for women (Collins.S, 2001) The design of the programmes should also consider available opportunities that could promote early detection of cases to prevent late presentation. The linkages provide an opportunity for increasing nutrition programme coverage and effectiveness. The possible sectors for integration are government line ministries and Non-Governmental Organisations (NGO's). Integration allows a combined response of interventions to attain programme impact since partners complement resources. The rate at which programmes are integrated into other programmes depend on the structure and capacity of the Ministry of Health in executing its mandate (Collins *et al*, 2006)

### **2.10.7 Monitoring and Evaluation**

A monitoring and evaluation plan is vital in a programme cycle as it assist in tracking programme implementation. Monitoring focuses on collecting, managing and utilizing data at the same time identifies programme weaknesses and strengthens (UNICEF, 2008). Rossi & Freeman (1993) defined evaluation as the compilation and analysis of information using different methods to determine the significance, progress, efficiency, effectiveness and impact of the programme activities. It provides information which determines whether the programme is achieving its set objectives and it assist in

determining programme cost benefit (Feuerstein, D., 1986). Evaluations mainly focus on different aspects of the programme such as effectiveness, sustainability, efficiency, coverage and appropriateness (Valid International, 2006). According to Dignan & Carr (1992), programme evaluation is vital for monitoring the efficacy of the programme which in turn assists in programme planning and direction as well as guide policy development.

#### **2.10.8 Supplies and Logistics**

For programmes to be effectively implemented, adequate supplies and logistics are required on time and in correct quantities. The supplies required include; therapeutic feeds, anthropometric tools and monitoring tools. When planning for programmes, it is important to consider the accessibility and availability of logistics and supplies at all levels of implementation for programme sustainability. Availability of supplies for programmes is one of the key process indicators for successful programme implementation (Gatchell *et al*, 2005).

#### **2.10.9 Knowledge and Practices of Health Personnel**

Training and orientation of Health workers and Community volunteers is vital for sustainability and management of nutrition programmes (Gatchell, Forsythe & Thomas, 2006). In order to overcome the problem of skilled staff in implementation of nutrition problems in Zambia, It is therefore recommended that nutrition programmes are integrated into the pre and in-service trainings of health professionals and agriculture training institutions and in refresher training of Community Health Workers and Extension workers. Literature revealed that South Sudan is currently working on including nutrition programmes in a one year nursing circular (Gatchell *et al*, 2006). Health workers and stakeholders participating in nutrition programmes should put into practice actions which are vital to the success of the programmes. The key practices in nutrition programmes that need to be adhered to are; admission and discharge criteria, key education messages, action protocols and routine medicines in nutrition programmes.

# **Chapter Three: Aim of the Study**



## Chapter Three

### 3.0 Aim of the Study

The aim of the study was to assess the effectiveness of the Outpatient Therapeutic Programme (OTP) for management of Severe Acute Malnutrition (SAM) in the three districts of Eastern Province, Zambia in reducing case fatality rates.

### 3.1 Specific Objectives:

The specific objectives for the study were to;

1. compare the performance outcomes (discharge, death and defaulter rates) of the Outpatient Therapeutic Programme against the minimum standards used in evaluating Outpatient Therapeutic Programme
2. determine mean length of stay of children enrolled in the Outpatient Therapeutic Programme between first September 2008 and 30<sup>th</sup> August 2010
3. determine the percentage of children with good rate of weight gain ( $\geq 8$  g / kg body weight / day) in the Outpatient Therapeutic Programme
4. determine the case fatality rates due to Severe Acute Malnutrition between first September 2008 and 30<sup>th</sup> August 2010 in the Outpatient Therapeutic Programme
5. determine knowledge and practices of health workers and stakeholders in implementing the Outpatient Therapeutic Programme for management of Severe Acute Malnutrition

### 3.2 Implementation Objectives

1. Based on the findings, recommendations will be made for improving and strengthening the Outpatient Therapeutic Programme in reducing malnutrition rates in Eastern province.
2. The findings of the study will be used to influence policy regarding Outpatient Therapeutic Programme implementation in Zambia.

# **Chapter Four: Research Methodology**



## Chapter Four

### 4.0 Research Methodology

#### 4.1 Introduction

This chapter specifically focuses on the methodological strategies that were utilised in this study. It addresses aspects of the study design and population, sampling procedure and sample size, data collection methods, reliability, validity and data analysis. In addition, the chapter highlights aspects of ethical considerations and the study limitations.

#### 4.2 Study Approach

For the purpose of this study, a positivist approach was applied as it provided information on whether the programme was working or not and also determined factors that contributed to the programme outcomes. The positivist approach to research is based on knowledge gained from positive verification of evident experience rather than perception Tuli. F (2010). It uses scientific methods to study and write about human experience while keeping the research free from values, passions, politics and ideology of the researcher. The approach was selected because there was already knowledge about the subject that was evaluated in other settings. In addition, the approach is a standardised one used to evaluate the Outpatient Therapeutic Programme therefore it was applied. Data in form of numbers and statistical analysis was applied hence other approaches were not considered for the study.

#### 4.3 Study Design

A post intervention study design was used. Data was collected through record reviews and oral interviews.

#### 4.4 Study Site

The study was conducted in three districts of Eastern Province where the Outpatient Therapeutic Programmes (OTP) has been implemented since 2008 namely; Muzeyi OTP in Chipata, Kafumbwe OTP in Katete and Msanzala OTP in Petauke district. The population distribution for the three districts was: 458,700; 233582 and 315,812 for Chipata, Katete and Petauke respectively of which 20 % were children more than years of age (Ministry of Health, 2007). More than a third of the children more than five years of age were wasted (Central Statistical Office *et al*, 2009). The three OTP Centres namely; Muzeyi, Kafumbwe and Msanzala were established within existing Rural Health Centres (RHCs), one each in Chipata (Muzeyi RHC), Katete (Kafumbwe RHC) and Petauke (Msanzala RHC) districts. In the programme, community volunteers render preventive and promotive services; they also mobilise communities for outreach services.

#### 4.5 Study Population

All records of children 6 – 59 months of age admitted in the Outpatient Therapeutic Programme between first September 2008 and 30<sup>th</sup> August 2010, Health workers and Community volunteers involved in the Outpatient Therapeutic Programme for a period of more than three months were eligible in the study. Key informants from line ministries; Ministry of Health, Ministry of Agriculture and Livestock and Ministry of Community Development, Mother and Child Health involved in the programme also participated in the study. At the District Medical Office, the District Medical Officer, District Health Planner, and District Nutritionist were included in the study. The officers in charge of nutrition in the Ministry of Agriculture and Livestock and Ministry of Community Development Mother and Child Health were also included in the study.

The exclusion criteria in the study were;

1. All records of children < 6 months of age and children > 5 years of age admitted into the Outpatient Therapeutic Programme between first September 2008 and 30<sup>th</sup> August 2010 were excluded from the study.

2. The Health workers and Community volunteers involved in management of children with severe acute malnutrition at the Outpatient Therapeutic Programme Centre for a period less than three months were excluded from the study.

#### 4.6 Research Quantitative Variables/ Indicators

The key variables that were considered at the Outpatient Therapeutic Programme in the study are tabulated in table 9.

**Table 9: Variables Used in the Study**

Type of Variables	Conceptual Definition	Operational Definition	Scale of Measurement
<b>1. Performance variables</b>			
Dependent variable	Weight	Average Weight gain of $\geq 8g / kg / day$ (Valid International, 2006)	Continuous, in kg
	Recovered	Recovery rate is the % of children admitted to the OTP who recovered which should be $>75\%$	Discrete
	Defaulters	Defaulter rate is the % of exits from the OTP who fail to complete to the end which should be $< 15\%$	Discrete
	Length of stay	Average length of Stay in the OTP is the maximum number of days admitted to the OTP $< 60$ days (Valid International 2006).	Ordinal in groups of weeks (1, 2, 3,)
	Death	Death rates of registered patients are the number of exits from the OTP who die before completing the treatment, which should be $< 10\%$ .	Discrete
<b>2. Capacity Building and Human Resource variables</b>			
Independent	Training	Number of Staff trained in OTP	Discrete
		Type of staff trained / oriented in OTP	Nominal
<b>3. Background Variables</b>			
Independent	Age	Age in months at the time of admission for $< 5$ children whose records will be reviewed	Continuous , in months
	Sex	Childs gender.	Nominal as female or male
	Point of admission	Point of admission of patient in to the programme	Ordinal 1. Community 2. Inpatient 3. Health Centre
	Human Resource	Designation of staff to be interviewed	Ordinal,
	Admission criteria	Admission criteria is the criteria that was used to admit clients in to the programme	Ordinal 1. MUAC 2. Oedema



	Discharge Criteria	Discharge criteria is the criteria that was used to discharge clients from the programme	Ordinal 1. MUAC 2. Oedema
<b>4. Supplies, Equipment's and Drugs</b>			
Independent	Supplies	Materials in short supply at the OTP	Nominal
	Drug stock	A variety of drugs required at the OTP centre	Nominal
	Stock Out	Reasons for stock outs: supplies and drug	Nominal
<b>5. Community Volunteers and Mobilisation</b>			
Independent	Volunteer Dropout	Proportion of volunteers dropout Reasons for volunteers drop out in OTP	Nominal
	Community Involvement	Type of activities communities are involved in OTP	Nominal
<b>6. Coordination, Funding and Monitoring</b>			
Independent	coordination	Presence of OTP coordinator at the centre	Nominal
	Programme Funding	Inclusion of OTP activities in action plan	Nominal
		OTP Components included in the action plan	Nominal
	Monitoring & Evaluation	Availability of Monitoring and evaluation plan	Nominal
		Type of information collected	Nominal
		Methods of sharing M & E OTP information	Nominal
<b>7. Service provision</b>			
Independent	Defaulters	Reasons for defaulting	Nominal
<b>8. Programme linkages and Integration</b>			
Independent	Linkages	Type of Livelihood programme linked to OTP	Nominal
	Integration	Type of Health programme integrated in OTP	Ordinal

**Table 10: Variables for Performance Outcome**

Type of Indicator	Cut Offs
1. <b>Weight:</b> Mean weight gain of > 8g /kg /day (Valid International 2006)	< 8g = 0 ≥ 8g = 1
2. <b>Recovery:</b> Recovery rate is the proportion of clients admitted to the OTP who recovered which should be > 75% (SPHERE, 2004)	Not Recovered =0 Recovered = 1
3. <b>Defaulters:</b> Defaulter rate is the proportion of exits from the OTP who fail to complete to the end, which is recommended to be < 15% (SPHERE, 2004; Valid International, 2006).	Defaulted = 0 Non Defaulter = 1
4. <b>Death:</b> Death rate is the proportion of registered clients that exit from the OTP by death before completing the treatment, which is recommended to be < 10% (SPHERE, 2004; Valid International; 2006).	Died = 0 Alive = 1
5. <b>Length of Stay:</b> average length of stay in OTP is the maximum number of days admitted to the OTP which is recommended at < 60 days ( Valid International , 2006)	> 60 days = 0 < 60 days = 1

## 4.7 Sampling Procedure and Sample Size

### 4.7.1 Selection of Children Records

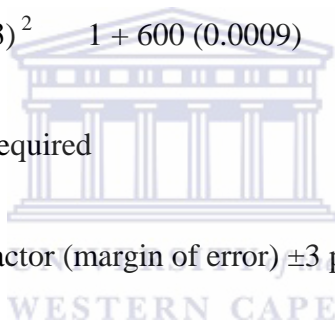
All the three Rural Health Centres implementing the Outpatient Therapeutic Programme (OTP) in Chipata, Katete and Petauke districts were included in the study. All children records were collected from the three OTP Centres and a random sampling procedure was used to select the required sample. With the knowledge of the number of children in the programme (600 from the OTP record cards) a minimum sample size of 390 was selected (calculations derived from the required precision of about 3 % and the error of the risk of about 5 %). The formula below was used to determine a sample of records.

$$n_1 = \frac{N}{1 + N(e)^2} = \frac{600}{1 + 600(0.03)^2} = \frac{600}{1 + 600(0.0009)} = \frac{600}{1 + 0.54} = \frac{600}{1.54} = \underline{600} = \underline{390}$$

$n_1$  = is the sample size required

N = Population Size

e = absolute precision factor (margin of error)  $\pm 3$  percent



### 4.7.2 Selection of Participants for Interviews

Participants who were interviewed were selected as follows; only officers from government line Ministries and Community volunteers involved in the programme for more than three months were purposely invited to participate in the study. Six Health workers, two from each of the three Outpatient Therapeutic Programme (OTP) Centres and fifteen Community volunteers, five from each of the OTP Centres, One District Medical Officer, One District Health Planner and One District Nutritionist from each of the districts implementing the OTP purposely selected to participate in the study. Six Ministry of Agriculture and Livestock Officers and six Ministry of Community Development, Mother and Child Health Officers, two from each of the three districts implementing the OTP were purposely selected to participate in the study.

### 4.7.3 Data Collection Method

The study employed two types of data collection methods namely, (1) retrospective record review for children that were admitted in the Outpatient Therapeutic Programme (OTP) between first September 2008 and 30<sup>th</sup> August 2010. The retrospective record review was complemented by face-to-face interviews which are suitable for both literate and illiterate people.

(11) Face to face interviews gathered data on knowledge and practices of staff in the implementation of the OTP. Data was collected by interviewing Health workers and key informants (District Medical Officers, District Health Planners, District Nutritionists, Agriculture Officers and Community Development Officers) from government line ministries involved in the OTP. The Community volunteers were interviewed because they take anthropometric measurement of clients in the programme, conduct case identification of severe acute malnutrition in communities and health facilities as well as following up clients in communities.

A data compilation form was used to collect secondary data while a structured questionnaire was used to collect primary data. The data collection tools were pretested in OTP Centers that did not participate in the study to verify if the tools collected the desired data and to ensure that the interviewers were conversant with data collection tools. The data collectors were trained on data collection tools and methods before data collection.

### 4.8 Data Collection

Data was collected from the 25<sup>th</sup> to 30<sup>th</sup> June, 2012. Record reviews at the OTP Centers were conducted by the District Nutritionists in their respective districts while key informant interviews were conducted by the Provincial Nutritionist. The key informant interview was conducted within 15 minutes.

**Record reviews:** To determine the percentage of children 6 - 59 months of age with good rate of weight gain ( $\geq 8$  g / kg / day) in OTP increased. The researcher conducted a record review to obtain the number of children, who were admitted in OTP from first September

2008 to 30<sup>th</sup> August 2010, who were diagnosed with malnutrition, (Kwashiorkor and Marasmus). From the register, the cases of malnutrition were grouped into Kwashiorkor and Marasmus, then calculated the average weight gain which is sum of weight gains (g / kg / d) divided by number of cases in the group. A data compilation form was used to compile the average weight gain in the Outpatient Therapeutic Programme.

To determine the average length of stay in OTP, the researcher conducted a record review to obtain the number of children who were admitted in OTP from first September 2008 to 30<sup>th</sup> August 2010, who were diagnosed with malnutrition (Kwashiorkor and Marasmus). The average length of stay in OTP was calculated by finding the sum of length of stay in days divided by the number of discharges. A data compilation form was used to compile the average length of stay in OTP. In order to determine the reduction in the case fatality rate due to severe acute malnutrition, the researcher conducted a record review to obtain the number of all children who were admitted to the OTP from first September 2008 to 30<sup>th</sup> August 2010, who had a diagnosis of malnutrition. Outcome of treatment (Recovery died and defaulted) was determined, and a percent of all deaths was calculated. The outcome data was collected using a data compilation form.

**Interviews:** In order to determine the knowledge and practices of staff implementing the Outpatient Therapeutic Programme, a structured questionnaire was administered to Health workers and stakeholders from the community, Ministry of Agriculture and Livestock and Ministry of Community Development Mother and Child Health. The data collected using a structured questionnaire was on financial and human resources, capacity building, community mobilisation, community volunteers, linkages with other nutrition programmes, supplies and logistics, monitoring and evaluation and knowledge and practices of health personnel. The officers that were interviewed were involved in the OTP for more than three months at either the OTP Centre or at the district. A structured questionnaire was used to gather information from the study participants.

## **4.9 Data Processing**

A data entry screen was created in Epi Info Version 3.5.3; data was entered and cleaned prior to analysis. During data processing, information collected was checked for completeness and internal consistency.

### **4.10 Reliability and Validity**

Quality control was done at various stages. To minimize sampling bias, a sample was selected that included only records of children admitted into the Outpatient Therapeutic Programme from first September 2008 to 30<sup>th</sup> August 2010. The records of children less than six months of age and those children more than five years of age were excluded from the study. Data collection tools were pretested and administered in English since the interviewees were able to read, write and speak English. Data collectors were trained on data collection tools and checklists were checked to ensure quality control by the supervisor. Prior and during data processing, information collected was checked for completeness and internal consistency. Inconsistency information was corrected while uncorrected information was excluded during analysis but were reported.

### **4.11 Data Analysis**

Prior to entering data for analysis, sorting and coding was done. Data was entered, cleaned and processed using Epi Info Version 3.5.3. A coding key was developed to enable standard coding for uniform answers. Coding of open-ended questions was done after examining questionnaires to group similar types of responses into single groups.

Data was analysed using frequencies, mean and cross tabulations for associations. The performance outcomes were arrived at by computing the five key outcomes (discharge, death and defaulter rates, weight gain and length of stay). The performance outcomes were calculated as follows;

**Case Fatality Rate is equal to:**

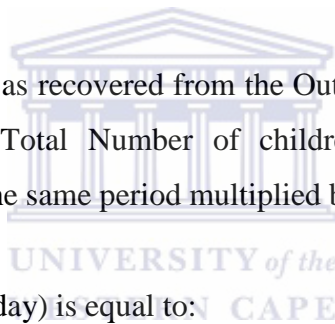
Number of deaths from severe acute malnutrition (SAM) during a specified period /  
Number of children admitted with SAM in the same period multiplied by 100

**Defaulter Rate is equal to:**

Number of defaulters in Outpatient Therapeutic Programme during a specified period /  
Total number of children enrolled in Outpatient Therapeutic Programme over the same  
period multiplied by 100

**Recovery Rate is equal to:**

Number of patients discharged as recovered from the Outpatient Therapeutic Programme  
during a specified period / Total Number of children enrolled in the Outpatient  
Therapeutic Programme over the same period multiplied by 100



**Average weight gain (g / kg / day) is equal to:**

$$\frac{[(\text{discharge weight (gram)} - \text{admission weight (gram)})]}{\text{admission weight (kg)} \times \text{number of days between admission and discharge}}$$

**Average Length of Stay (days) is equal to:**

Sum of length of stay (in days) of recovered patients in the Outpatient Therapeutic  
Programme) / Number of recovered patients in the Outpatient Therapeutic Programme

Data from interviews was processed and analysed using Epi Info Version 3.5.3. During  
analysis, all missing values were omitted to avoid distortion of the findings, but were  
reported.

#### **4.12 Ethical consideration**

Informed consent was obtained before interviewing participants (Health workers, Community volunteers and staff from Ministry of Agriculture and Livestock and, Ministry of Community Development Mother and Child Health). An explanation of the purpose of the research and right to withdraw without giving any reason was provided to participants before they consented to be interviewed. The District Medical Officers gave consent to review the records in Outpatient Therapeutic Programme Centres.

The information from the records collected from the Outpatient Therapeutic Programme Centres and key informants were not shared with other people for any other purpose to preserve confidentiality and privacy. The records were provided with numbers for identification instead of names and once entered in the computer, a password was created to avoid unpermitted access to files.

Permission for authority to conduct the study was obtained from University of Zambia Biomedical Ethics Committee (UNZABREC) and Ministry of Health. Meanwhile, the University of the Western Cape (UWC) Ethics committee also gave permission to conduct the study. The provincial Medical Officer and the District Medical Officers also gave permission to collect data in the three Outpatient Therapeutic Programme Centres in Chipata, Katete and Petauke districts.

# Chapter Five: Results





## Chapter Five

### 5.0 Results

Presentation of the study results is done in two parts. Part one focuses on data collected at the Outpatient Therapeutic (OTP) Centre using record review. Part two, presents data collected using the questionnaires administered to key informants during the study. The key informant results were further summarised into three categories of the key informants namely: OTP Centre and District staff, and OTP District health staff.

For clarity, the results in part one were summarised under the following thematic areas: Demographic characteristics, admissions in OTP, discharges from OTP, average length of stay in OTP, average weight gain in OTP, programme outcomes (Recovery, defaulter and death rates) and the comparison between the Minimum Sphere Standards indicators for Therapeutic Feeding Centres with the study results.

### 5.1 Record Review

#### 5.1.0 Demographic Characteristics

##### 5.1.1 Sample Size

The number of children in the Outpatient Therapeutic Programme (OTP) with fully completed OTP cards from first September to 30<sup>th</sup> August 2010 was 600. With the knowledge of the number of children in the OTP, a minimum sample size of 390 children records were selected and reviewed. A total of 130 records at each of the three OTP Centres in Chipata, Katete and Peatuke district were reviewed in the study.

Among the 390 children records that were reviewed, the gender distribution showed that there were more females 57.4 % (224) with a 95 % Confidence Interval (CI) of (52.4 %, 62.4 %) than males 42.6 % (166) in the programme with a CI of (37.6 %, 47.6 %). The age of children at admission was calculated in months and their ages were grouped in three categories amongst the 390 children in the study, 13.6 % (53) were aged between 6

and 11 months, 52.6 % (205) were aged between 12 and 23 months while 33.8 % (132) were aged between 24 and 59 months.

### 5.1.2 Age Group Distribution by District

Figure 3 below shows the distribution of age group in the study by district.

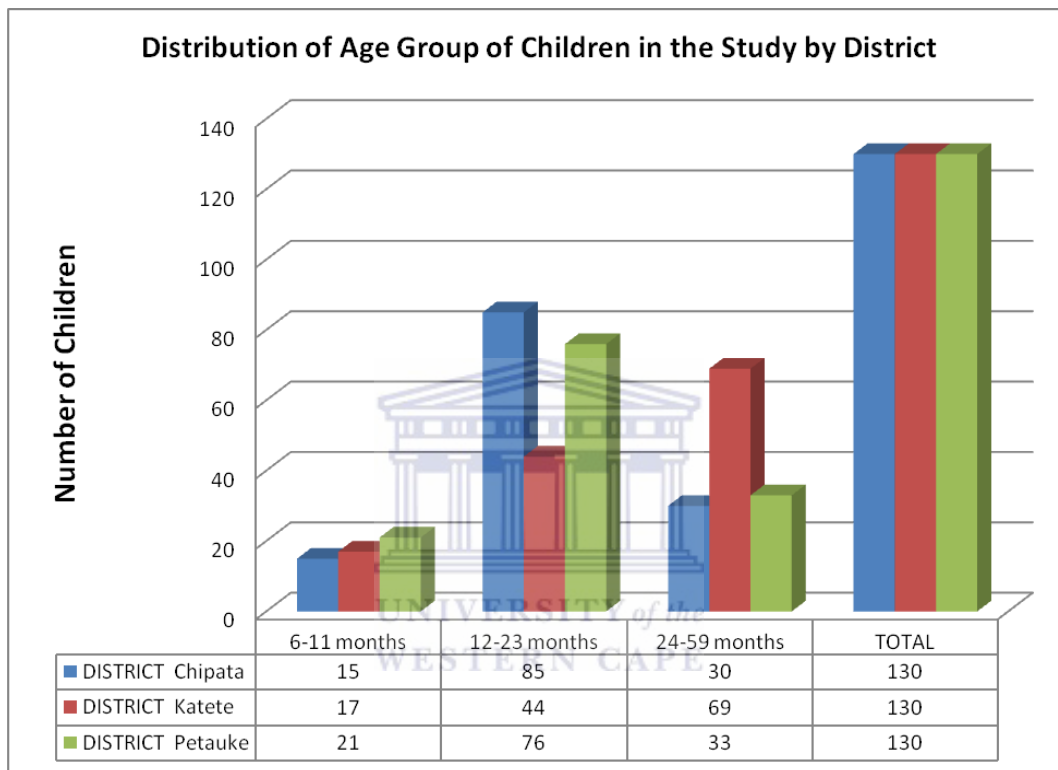


Figure 3: Distribution of Age Group by District

## 5.2.0 Admissions in the Programme

### 5.2.1 Admission Criteria in the Programme

Two admission criteria were used to admit children in Outpatient Therapeutic Programme namely; Marasmus (Mid-Upper-Arm Circumference < 11.5 cm) and Kwashiorkor (presence of bilateral pitting Oedema). Figure 4 presents the admission profile of children in the Outpatient Therapeutic Programme, 61 % (238) of the children were admitted suffering from Kwashiorkor while 39 % (152) suffered from Marasmus.

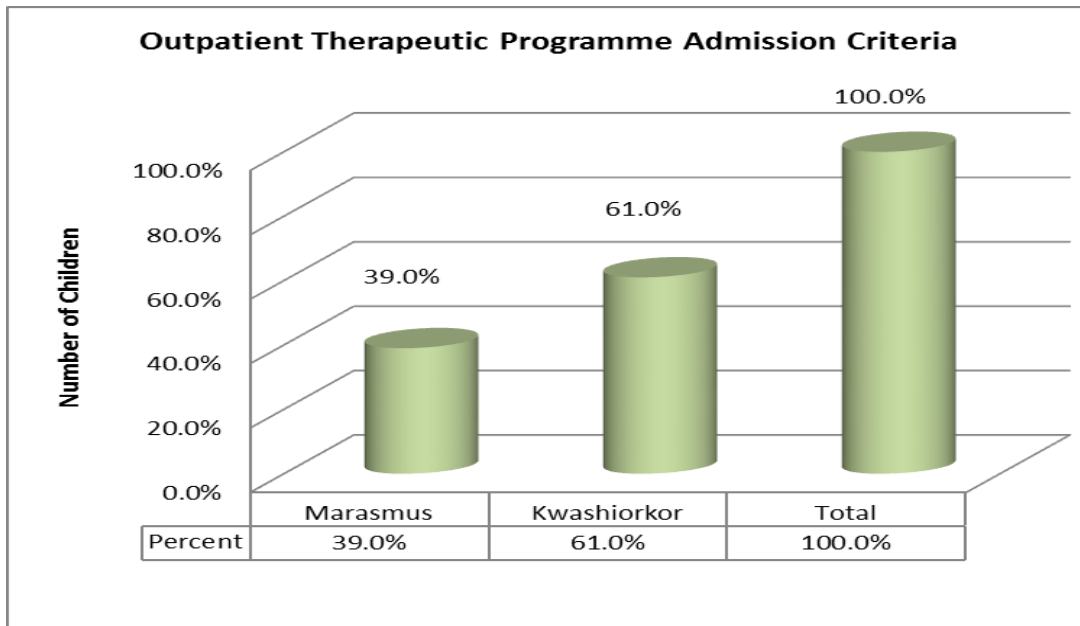


Figure 4: Admission Criteria in the Programme

### 5.2.2 Admission Criteria by Age Group

Figure 5 shows that 70 % (37 / 53) of the children aged 6 - 11 months in the study had Mid-Upper-Arm Circumference (MUAC) < 11.5 cm while 30 % (16) had oedema. The figure also shows that 59 % (121 / 390) of the children aged 12 – 23 months had oedema while 41 % (84 / 205) in the same age group had MUAC < 11.5 cm. The study also revealed that 76 % (101) of children aged 24 – 59 months had oedema while 24 % (31) in the same age group had MUAC < 11.5 cm.

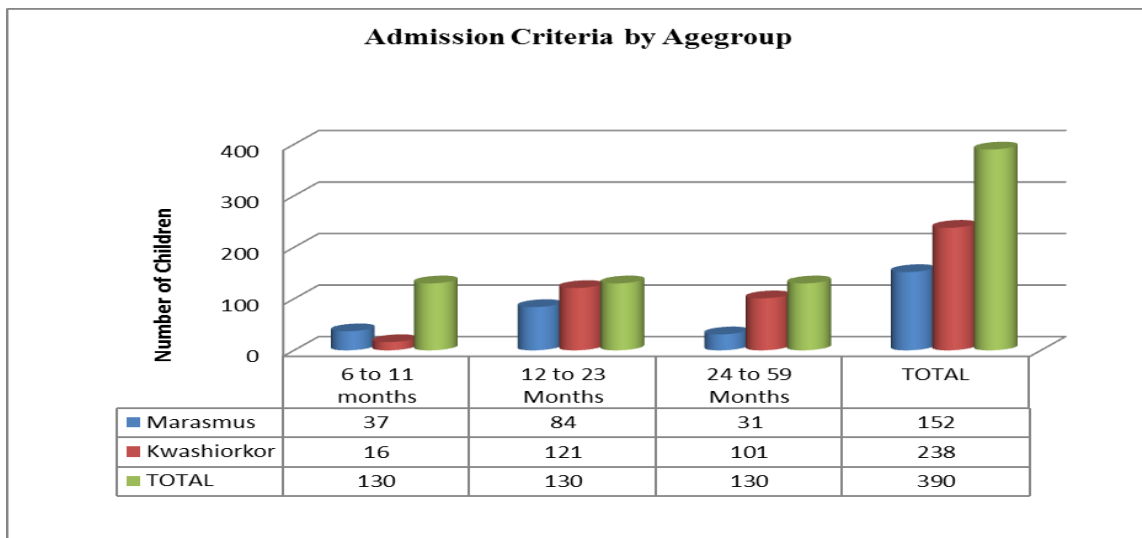


Figure 5: Admission Criteria by Age Group

### 5.2.3 Admission Criteria in the Programme by District

Figure 6: presents the admission criteria of children in the study by district. Katete and Peatuke districts reported higher numbers of children admissions with kwashiorkor at 98 and 78 children respectively compared with Chipata district with only 62 children.

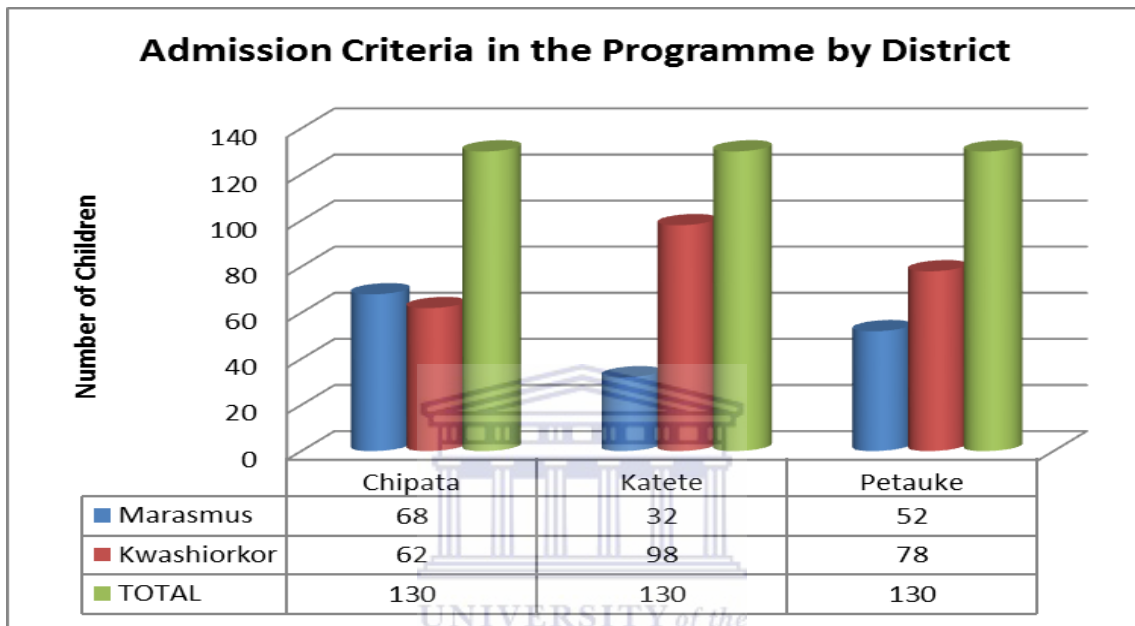


Figure 6: Admission Criteria in the Programme by District

### 5.2.4 Admission of Children by Year: First September to 30<sup>th</sup> August 2010

The study period covers first September 2008 to 30<sup>th</sup> August 2010. A total of 41 children were admitted into the Outpatient Therapeutic Programme from first September to 30<sup>th</sup> December 2008, 208 children were admitted from first January to 30<sup>th</sup> December 2009 while 140 were admitted from first January to 30<sup>th</sup> August 2010. Table 11 shows frequency of admission by year in the Outpatient Therapeutic Programme.

**Table 11: Admission of Children in the Programme by Year: First Sept 2008 - 30<sup>th</sup> Aug 2010**

Year of Admission	Frequency	Percent
2008	41	10.5 %
2009	208	53.3 %
2010	141	36.2 %

### 5.3.0 Discharges from the Programme

#### 5.3.1 Distribution of Discharges from the Programme

Children in the Outpatient Therapeutic Programme (OTP) were discharged according to the admission criteria, those admitted with Mid – Upper - Arm Circumference (MUAC) < 11.5 cm were only discharged when they attained MUAC > 11.5 cm, those who were admitted with presence of bilateral pitting oedema were discharged when there was no presence of oedema on two consecutive weeks Table 12 below shows the number of discharges in OTP by year from first September 2008 to 30<sup>th</sup> August 2010.

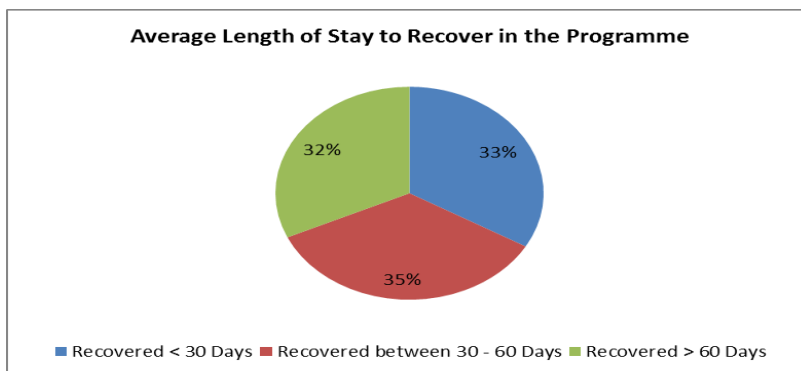
**Table 12: Frequency of Discharged Children by Year: First Sept - 30th Aug 2010**

Year Discharged	Frequency	Percent
2008	31	7.9 %
2009	176	45.1 %
2010	183	46.9 %
Total	390	100.0 %

#### 5.4.0 Average Length of Stay in the Outpatient Therapeutic Programme

##### 5.4.1 Average Length of Stay to Recover in the OTP

Amongst the children who had recovered, 68 % (266) stayed in the Outpatient Therapeutic Programme (OTP) for less than 60 days while 32 % (124) stayed in OTP for more than 60 days. It was observed that 33 % (130) of the children recovered below 30 days of their stay in OTP. Figure 7 shows the average length of stay to recover in OTP.



**Figure 7: Average Length of Stay in the Outpatient Therapeutic Programme**

### 5.4.2 Average Length of Stay in the Programme by District

Figure 8 shows the average length of stay of children in Outpatient Therapeutic Programme (OTP) by district. Katete and Chipata districts reported the highest number of children that recovered within 60 days of their admission in OTP at 112 and 95 respectively while Peatuke had the least number of children that recovered within 60 days at 59.

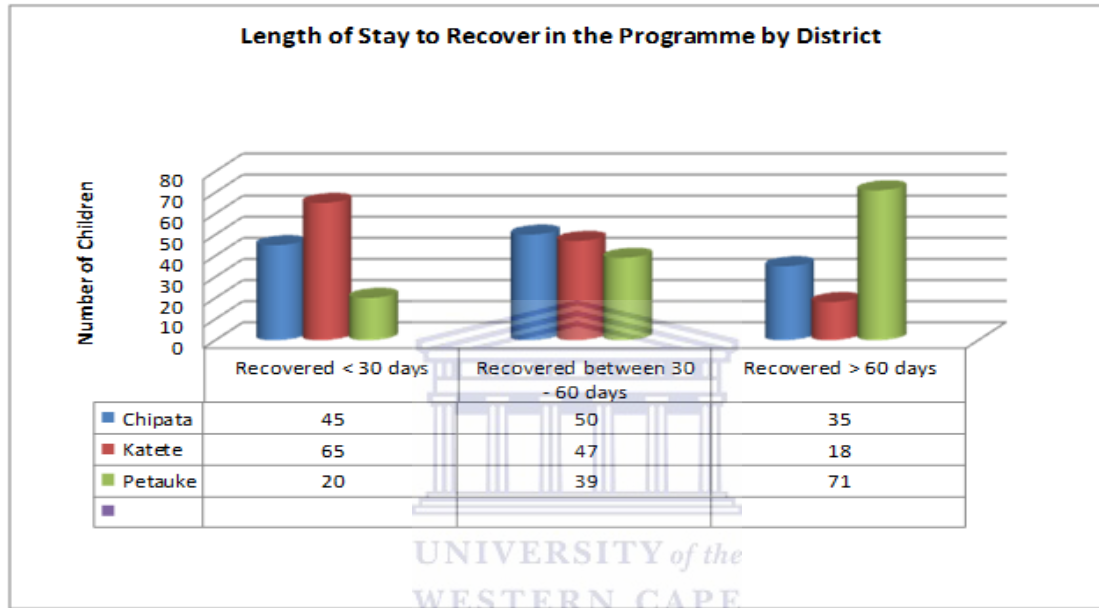


Figure 8: Length of Stay in the Outpatient Therapeutic Programme By District

### 5.4.3 Average Length of Stay to Recover in the OTP

It was found that the average length of stay to recover was 44 days; average length of stay to death was 21 days while the average length of stay to default was 28 days. The average length of stay in Outpatient Therapeutic Programme (OTP) of children admitted with Mid-Upper-Arm Circumference (MUAC) < 11.5 cm was 50 days while the average length of stay for those admitted with oedema was 35 days. The average length of stay was 42 days for children that were admitted from the community, average length of stay was 40.5 days for children admitted from the Health center while the average length of stay was 37.5 days from those admitted from Inpatient Therapeutic Programme.

Meanwhile, the average length of stay in the OTP for children admitted with MUAC < 11.5 cm in Chipata district was 49 days while those admitted with oedema was 31.5 days. In Petauke, the average length of stay for children admitted with MUAC < 11.5 cm was 67 days while those admitted with oedema was 49 days. The study also revealed that the length of stay for children admitted with MUAC < 11.5 cm in Katete district was 35.5 days while those admitted with oedema was 28 days.

## 5.5.0 Programme Outcome.

### 5.5.1 Mortality, Recovery and Defaulter Rate

Table 13 presents Outpatient Therapeutic Programme outcome data. A total of 312 children (80 %) children with a 95 % CI of (75.7 %, 83.9 %) recovered, 11 children (2.8 %) at 95 % CI of (1.5 %, 5.1 %) died and 67 children (17.2 %) with a 95 % CI of (13.6 %, 21.4 %) defaulted in the Outpatient Therapeutic Programme.

**Table 13: Outpatient Therapeutic Programme Outcomes**

Programme Outcome	Frequency	Percent
Recovered	312	80.0 %
Death	11	2.8 %
Default	67	17.2 %
Total	390	100.0 %

### 5.5.2 Case Fatality Rates

Figure 9 shows the case fatality rates. It was revealed that case fatality in the Outpatient Therapeutic Programme was at 1.97 % (3) for Marasmus and 3.36 % (8) for admissions with Kwashiorkor.

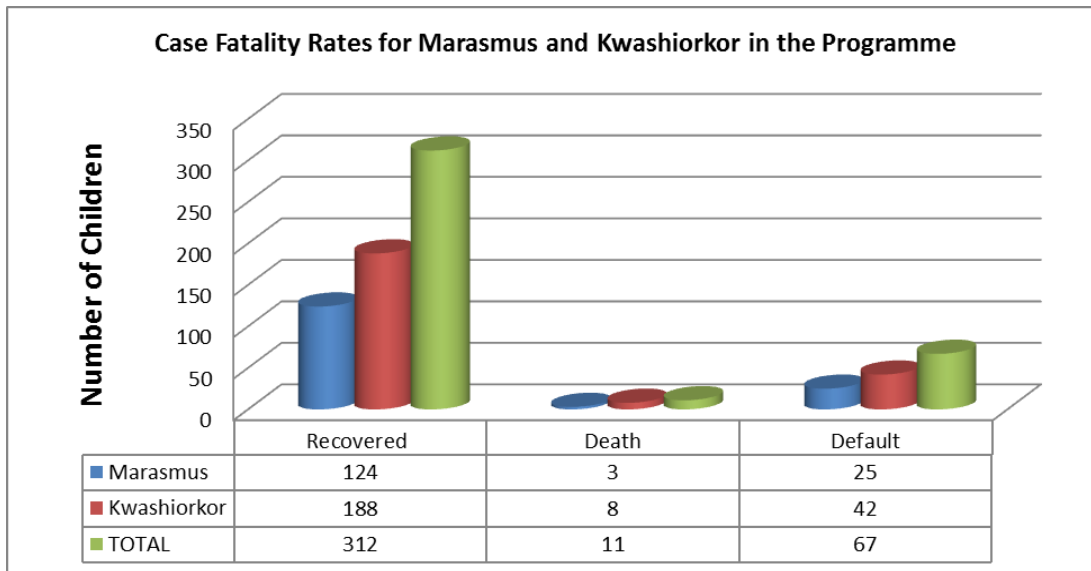


Figure 9: Case Fatality Rates for Marasmus and Kwashiorkor

### 5.5.3 Trend of Case Fatality Rate

Figure 10 presents trend in case fatality rates in the Outpatient Therapeutic Programme from first September 2008 to 30<sup>th</sup> August 2010 for children admitted with Mid-Upper-Arm Circumference < 11.5 cm and those with oedema. The figure below also shows that more children with Kwashiorkor died than those with Marasmus in the programme.

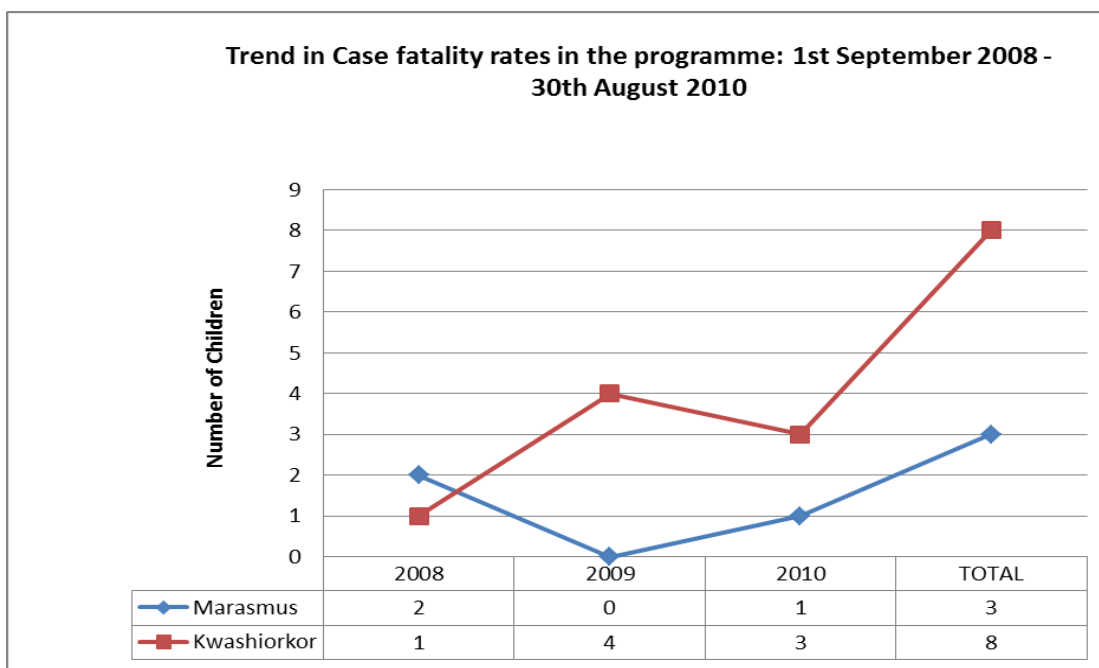


Figure 10: Case Fatality Rate Trend in the OTP from 1st Sept 2008 - 30th Aug 2010



#### 5.5.4 Programme Outcome by Age group

The study revealed that 52 % (160) of the children that recovered in the Outpatient Therapeutic Programme (OTP) were aged between 12 – 23 months, 34 % (105) were aged between 24 –59 months while 14% (43) were aged between 6 – 11 months of age. It was revealed that 56 % (9) of deaths were aged between 12 – 23 months, 31 % (5) were aged between 6 – 11 months of age while 13 % (2) were aged between 24 – 59 months of age. Fifty four percent (36) of the children aged between 12 – 23 months of age defaulted, 38 % (25) of children aged 24 – 59 months defaulted while 8 % (5) were reported to have defaulted from the OTP. Table 14 shows the programme outcomes by age group.

**Table 14: Outpatient Therapeutic Programme Outcome by Diagnosis**

Age group	Recovered	Death	Default	TOTAL
6-11 months	43	5	5	53
12-23 months	160	9	36	205
24-59 months	105	2	25	132
TOTAL	308	16	66	390

#### 5.5.5 Outpatient Therapeutic Programme Outcome by Diagnosis

The two admission criteria that were used to enroll children with severe acute malnutrition in the Outpatient Therapeutic Programme (OTP) were Mid Upper Arm Circumference less than 11.5 cm and the presence of bilateral pitting oedema. Once the children were admitted into the OTP, trained Health workers screened them again to come up with the diagnosis while in the OTP. The OTP outcome by diagnosis was similar to the admission criteria.

#### 5.6.0 Average Weight Gain

##### 5.6.1 Average Weight Gain in the Programme

Figure 11 shows that 61 % (238/390) of the children in the Outpatient Therapeutic Programme gained weight while 39 % (152 / 390) did not.

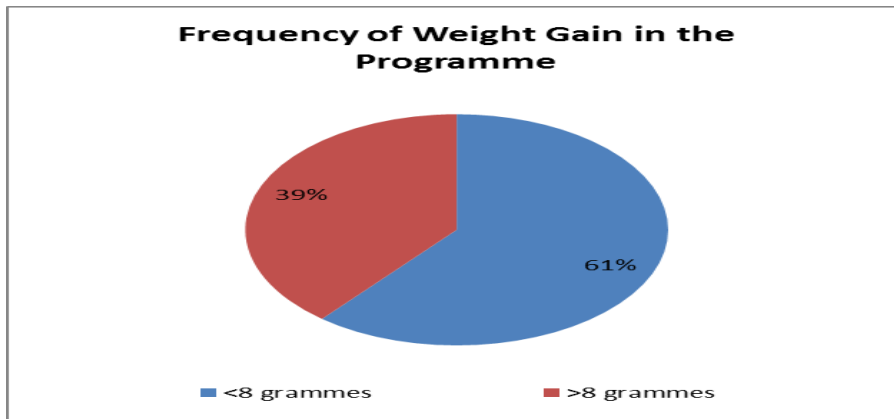


Figure 11: Frequency of Weight Gain in the Outpatient Therapeutic Programme

The study revealed that overall, the average weight gain amongst all admissions with MUAC < 11.5 cm in Outpatient Therapeutic Programme (OTP) was 10 g [8 – 17] kg per day while children that were admitted with oedema showed no signs of weight gain in OTP. The study also revealed that overall; the average weight gain amongst all admissions with MUAC < 11.5 cm in Chipata was 10 g / kg / day, 9 g / kg / day in Katete district, while in Petauke district the average weight gain was 10.5 g / kg / day. The children admitted with oedema showed no sign of weight gain at the time of discharge due to the loss of oedema.

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### 5.6.2 Average Weight Gain by District

Figure 12 shows the distribution of weight gain by district in the study. Amongst the three districts in the study, Katete reported 41 % (98 / 238) of children in the programme gained weight followed by Peatuke at 33 % (78/ 238 and Chipata at 26 % (62 / 238).

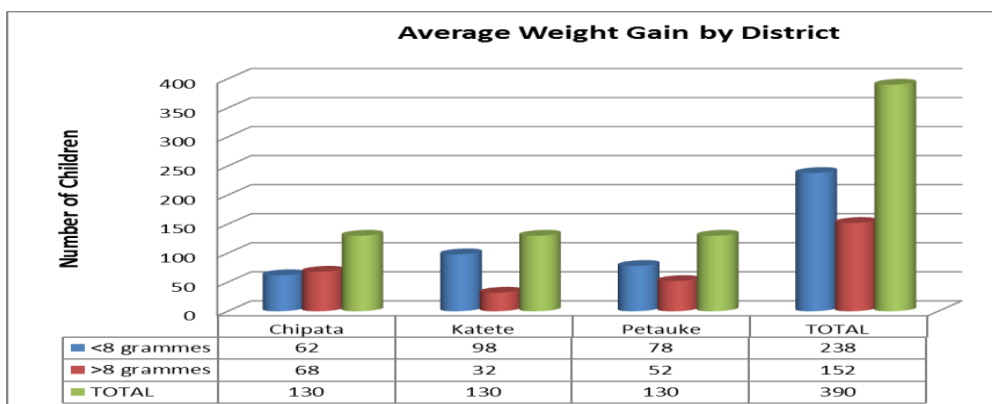


Figure 12: Average Weight Gain by District

## 5.7.0 Comparison of Programme Outcome Results

### 5.7.1 Comparison between Sphere indicators for Therapeutic Feeding Centres with Study Results

Table 15 compares recovery, mortality and defaulter rates of this study with the recommended Minimum Sphere Standard indicators for Therapeutic Feeding Centres. Recovery and mortality rates in this study were all within the recommended Sphere Standards for Therapeutic Feeding Centres while defaulter rate was beyond the recommended Minimum Sphere Standards.

**Table 15: Comparisons between Sphere Standards (2011) for TFP and Study Results**

Programme outcome indicators (SPHERE 2011)		
Key indicator International	Standard	Study result
Proportion of exits from a therapeutic feeding programme who have died	< 10 %	2.8 %
Proportion of exits from a therapeutic feeding programme who have recovered	> 75 %	80.0 %
Proportion of exits from a therapeutic feeding programme who have defaulted	< 15 %	17.2 %
Minimum mean rate of weight gain (g kg <sup>-1</sup> person <sup>-1</sup> day <sup>-1</sup> )	> 8 g	10 g

Table 16 below compares the programme outcomes by district with the recommended Minimum Sphere Standard indicators for Therapeutic Feeding Centres. The Outpatient Therapeutic Programme was well accepted in Petauke district since all the programme outcomes (Recovery, death and defaulter rates) were within the recommended Sphere Standard indicators for Therapeutic Feeding Centres as shown below.

**Table 16: Comparisons between Sphere Standards (2011) for TFP and Study Results by District**

Key indicator International	Standard	Chipata District	Katete District	Petauke District
Proportion of exits from a therapeutic feeding programme who have died	< 10 %	3.5%	0.8%	3.8%
Proportion of exits from a therapeutic feeding programme who have recovered	> 75 %	76.9%	73.8%	89.2%
Proportion of exits from a therapeutic feeding programme who have defaulted	< 15 %	19.2%	25.4%	6.9%

## 5.8.0 Findings on Knowledge and Staff Practices

### 5.8.1 Key informants

There were three groups of key informants in this study namely: the Outpatient Therapeutic Programme (OTP) centre staff, district health office staff and OTP district staff from the Ministry of Agriculture and from the Ministry of Community Development Mother and Child Health. The study results of key informants were summarised in the following thematic areas: Knowledge on service provision, linkages with livelihood and health programmes, community mobilisation, monitoring and evaluation, funding, supplies and drugs, human resource and coordination. Table 17 shows the 38 key informants and their designation per districts that were interviewed in the study. The breakdown of informants is as follows; 20 OTP Centre staff, nine OTP District staff and six District Medical Office staff from Chipata, Katete and Petauke district. A total of 14 informants were interviewed from Chipata, 13 in Katete and 11 in Petauke district.

**Table 17: Key Informants Interviewed in the Study**

	Designation of staff at the OTP Centre	Chipata	Katete	Petauke	TOTAL
1	CDE	0	1	1	2
2	Community Development Officer	1	0	0	1
3	Community Health Worker	1	0	0	1
4	Community Volunteer	4	4	2	10
5	Nurse	2	2	2	6
	<b>Sub-total</b>	<b>8</b>	<b>7</b>	<b>5</b>	<b>20</b>
	<b>Designation of Stakeholders at district</b>				
1	Assistant Community Development Officer	0	0	1	1
2	Community Development Officer	1	3	1	5
3	Agriculture Nutrition Officer	1	0	1	2
4	Senior Community Development Officer	1	0	0	1
	<b>Su-total</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>9</b>
	<b>Designation of District Health Staff</b>				
1	District Medical Officer	1	1	1	1
2	District Nutritionist	1	1	1	1
3	District Health Planner	1	1	1	1
	<b>Sub-total</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
	<b>Grand -total</b>	<b>14</b>	<b>13</b>	<b>11</b>	<b>38</b>

Table 18 shows duration in months in which the Outpatient Therapeutic Programme (OTP) centre staff worked at the OTP. The study revealed that 90 % of the OTP staff had worked at the OTP Centre for a period above six months while 10 % indicated that they had worked at the OTP Centre for a period between three and six months.

**Table 18: Number of Months Staff Worked at the Outpatient Therapeutic Programme Centre**

Months worked at OTP Centre	Frequency	Percent
Between three and six months	2	10.0 %
More than six months	18	90.0 %
Total	20	100.0 %

### 5.8.2 Knowledge on Outpatient Therapeutic Programme service provision

All the twenty Outpatient Therapeutic Programme (OTP) Centre staff and nine OTP District staff interviewed in the study were oriented in the OTP and they are currently participating in the activities at the OTP Centre. At the District Medical Office, six out of nine District medical staff interviewed were oriented; the three staff that were not oriented were the District Medical Officers (DMOs) from Katete and Petauke district and the District Planner from Petauke district. The key informants interviewed were all conversant with the admission criteria (MUAC < 11.5 cm and presence of bilateral pitting oedema) and discharge criteria (MUAC > 11.5 cm and no presence of bilateral pitting oedema) criteria used in the programme. The OTP Centre staff revealed that there were cases of clients defaulting in all the three programme areas. Table 19 below shows the reasons for defaulting in the programme. The study revealed that 52.8 % of the key informants indicated that clients defaulted because of Ready to Use Therapeutic Food stock out, 31.6 % defaulted due to long distances from home to the OTP centre while 15.8 % defaulted because caregivers assumed their children had recovered.

**Table 19: Reasons for Clients Defaulting from the Outpatient Therapeutic Programme**

Reasons for client defaulting	Frequency	Percent
Child Recovered	3	15.8 %
Long Distance to the facility	6	31.6 %
RUTF Stock out	10	52.8 %
Total	19	100.0 %

### 5.8.3 Failure to Gain Weight

Table 20 below shows that 70 % of Outpatient Therapeutic Programme Centre (OTP) staff reported that there were children in the OTP that failed to attain adequate weight gain. Those children who failed to attain adequate weight were either referred for further investigation or caretakers were given advice on infant feeding.

**Table 20: Children Failing to Attain Adequate Weight Gain in the OTP**

Children failing to attain adequate weight gain in OTP	Frequency	Percent
No	6	30.0%
Yes	14	70.0%
Total	20	100.0%

### 5.8.4 Linkages with Outpatient Therapeutic Programme

Table 21 shows that 35 % of the Outpatient Therapeutic Programme Centre (OTP) staff indicated that clients were referred to livelihood programmes once discharged from the OTP while 65 % indicated that there was no referral to livelihood programmes. The only livelihood programme that clients were referred to was the Food Security Pack which is a government programme that provides cereal, legume and fertilizer to vulnerable families. Meanwhile the study revealed that both key informants from the District health office and district OTP staff indicated that there were no linkages between the OTP and livelihood programmes.

**Table 21: Referral to Livelihood Programmes**

Referral to Livelihood programmes	Frequency	Percent
No	13	65.0 %
Yes	7	35.0 %
Total	20	100.0 %

Table 22 shows that 90 % of the Outpatient Therapeutic Programme (OTP) Centre staff reported that clients were referred to nutrition and health programmes while 10 % indicated that clients were not referred to health and nutrition programme. The main

health and nutrition programmes that clients were referred to were; Growth Monitoring and Promotion (GMP), Supplementary Feeding Programme (SFP) and Child Immunisation. The District medical officers that were interviewed also confirmed that the OTP was linked to Growth Monitoring and Promotion and Supplementary Feeding Programme.

**Table 22: Referral of Clients to Health / Nutrition Programmes**

Referral of clients to Health/Nutrition programmes	Frequency	Percent
No	2	10.0 %
Yes	18	90.0 %
Total	20	100.0 %

### 5.8.5 Community Mobilization

All the key informants interviewed in the study indicated that the community was involved in the Outpatient Therapeutic Programme activities. It was also revealed that communities were involved in early identification and referral of cases of severe acute malnutrition to health facilities; follow up of clients discharged from the Outpatient Therapeutic Programme and in community mobilisation

### 5.8.6 Monitoring and Evaluation

All the informants interviewed indicated that all the three (3) Outpatient Therapeutic Programme Centres were monitored. Table 23 shows that 50 % the Outpatient Therapeutic Programme Centre staff indicated that information generated from monitoring was shared during review meetings while 10 % was shared during staff meetings. It was also revealed that 40 % of the key informants indicated that the information was not shared.

**Table 23: Mode of Information Sharing**

Mode of information sharing among staff	Frequency	Percent
Not shared	8	40.0 %
Review meetings	10	50.0 %
Staff meeting	2	10.0 %
Total	20	100.0 %

### 5.8.7 Financial Resources

The three Outpatient Therapeutic Programme (OTP) Centre staff and District Medical Office staff indicated that they planned and budgeted for OTP activities in their annual action plans. The study revealed that 55 % of the OTP Centre staff planned for training of staff, 25 % planned for monitoring while 20 % planned for review meetings. Table 24 below shows the OTP components planned.

**Table 24: Outpatient Therapeutic Programme Components Planned for in the Annual Action Plan**

OTP Components planned	Frequency	Percent
Monitoring of programme activities	5	25.0%
Review meetings	4	20.0%
Training of staff	11	55.0%
Total	20	100.0%

### 5.8.8 Ready to Use Therapeutic Food, Supplies and Drugs

The Outpatient Therapeutic Programme (OTP) Centre staff and the District Medical Office staff reported stock outs of Mid Upper Arm Circumference (MUAC) tapes, Ready to Use Therapeutic Foods, drugs and supplies in OTP Centres. The shortage of MUAC was due to erratic supply from the district and there were too many clients in OTP compared to supply. The MUAC tapes, Salter scales and monitoring tools were in short supply in the OTP Centres. The informants revealed that they experienced stock out of antibiotics (Amoxyl suspension), Mebendazole and Coatem in all the OTP Centres and the reasons for stock outs are tabulated in Table 25 below.

**Table 25: Reasons for Shortage of Drugs in the Outpatient Therapeutic Programme Centre**

Reasons for shortages of drugs	Frequency	Percent	Cum Percent
Erratic supply from the district	2	50.0%	50.0%
Inadequate supply	1	25.0%	75.0%
Too many clients in the programme	1	25.0%	100.0%
Total	4	100.0%	100.0%



### 5.8.9 Community Volunteer Dropout

Community volunteer drop out was reported by all the three Outpatient Therapeutic Programme Centre staff, District staff and the District Medical Office staff that were interviewed. Table 26 shows the reasons for Community volunteer drop out; 50 % of the Outpatient Therapeutic Programme Centre staff indicated that lack of motivation was the reason for Community volunteer dropout and too much work involved in Outpatient Therapeutic Programme contributed to Community volunteer dropout. The other 5 % indicated that Community volunteer drop out was as a result of having very few clients in the community with severe acute malnutrition.

**Table 26: Reasons for Community Volunteer Dropout in the Outpatient Therapeutic Programme**

Reasons for Volunteer dropout	Frequency	Percent
Lack of Motivation (No payment or Incentives)	10	50.0%
Too much work involved in the programme	9	45.0%
Very few clients in community with SAM	1	5.0%
Total	20	100.0%

### 5.8.10 Programme coordination

The study revealed that there was an Outpatient Therapeutic Programme coordinator at all levels of programme implementation (OTP Centre, district and provincial) in the three study areas.

# Chapter Six: Discussions



## Chapter Six

### 6.0 Discussion

The aim of the study was to assess the effectiveness of the Outpatient Therapeutic Programme (OTP) for management of severe acute malnutrition (SAM) in reducing mortality. Generally children admitted in the OTP performed well in four out of five OTP indicators (recovery rate (80 %), death rate (2.8 %), average weight gain (10g / kg / day and average length of stay to recover (44 days)) which exceeded the internationally accepted Minimum Sphere Standards for Therapeutic Feeding Centres (The Sphere Project, 2011) used in emergencies to improve the quality of service provision and to ensure accountability during calamities. The findings of this study were similar to previous studies that reported that management of SAM in an OTP prevented death among the severely malnourished children if cases of severe acute malnutrition were detected early before the condition became worse (Grobler, T & Collins, S, 2006).

Management of severe acute malnutrition in an OTP encourages early detection and treatment of cases hence increasing coverage of beneficiaries and recovery rates compared with Inpatient Therapeutic Programme management of SAM (WHO *et al*, 2007). The risk of cross infection is minimised in an OTP due to decentralised treatment since children are treated as outpatients and only visit the health facility for nutritional and clinical monitoring and collection of Ready to Use Therapeutic Food and drugs compared with Inpatient Therapeutic Programme management which uses centralised mode of treatment which exposes children to infections in the hospital resulting to high morbidity and mortality (Collins, 2004). The other benefit of OTP management of SAM is that the approach minimises the costs to families since the approach is cheaper than Inpatient Therapeutic Programme management while maximising access to treatment (WHO *et al*, 2007). Another documented benefit of OTP management of SAM is that treatment of SAM does not require the admission of malnourished children without medical complications in the hospital but they stay home within their communities and report to the health facility once in a week for nutrition monitoring and collection of

Ready to Use Therapeutic Food. In addition, OTP does not require a lot of skilled staff since it depends on community mobilisation and participation (Collins *et al*, 2006).

## **6.1 In Terms of Programme Outcomes**

This study demonstrates that severe acute malnutrition without medical complications can be successfully treated in Outpatient Therapeutic Programme (OTP) because about 80 % of children who were treated in OTP recovered, about 2.8 % died and about 17.2 % abstained for three consecutive weeks in the OTP (defaulted). In addition, the average weight gain in the OTP was 10 g / kg / day while the average length of stay in OTP was 44 days. The findings of this study exceeded the international accepted Minimum Sphere Standards for Therapeutic Feeding Centres (The Sphere Project, 2011) except for defaulter rate. The Minimum Sphere Standards recommends recovery rate of above 75 %, case fatality rate of below 10 %, defaulter rate of below 15 %, average weight gain of 8 g / kg / day and average length of stay of less than 60 days.

The findings of this study were similar to the studies conducted in Ethiopia to assess the effectiveness of the OTP treatment for severe acute malnutrition among children aged 6 – 120 months where the author reported 85 % recovery rate, 4 % mortality rate and 5 % defaulter rate. The only difference in the findings was in defaulter rate; the recovery, death and defaulter rates were reported to be 85 %, 4.5 % and 4.7 % respectively (Collins, S & Sadler, K, 2002). The variations in the findings between this study and the study conducted in Ethiopia to evaluate the effectiveness of the OTP was due to the study design used, this study had a larger sample size (600 children) and the selected sample was recruited over a period of two years while the Ethiopian study had a smaller sample size (170 children) and it covered a period of five months. The larger sample size coupled with a longer duration of study (two years) might have resulted in data inaccuracies while the Ethiopian study used a smaller sample size with a shorter duration of five months.

The good programme outcomes that were attained such as average weight gain (10 g / kg / day), average length of stay to recovery (44 days), recovery rate (80 %) and 2.8 % case fatality rate in spite of challenges such as RUTF, drug stock outs may indicate that

children were provided with other foods at home in addition to RUTF therefore complementing each other in terms of providing nutrients. At admission in the OTP, each child received 1.28 kg of RUTF as a weeks supply and they were required to visit the health facility once a week for collection of RUTF and for nutritional and clinical monitoring. The RUTF was made from vegetable fat, peanut butter, skimmed milk powder, lactoserum, maltodextrin, sugar, and mineral and vitamin complex. RUTF provides 4.2 MJ of energy and 24.3 g of protein/day (Collins, S & Sadler, K, 2002). It has a similar nutrient content but greater energy and nutrient density than F100, the diet recommended by World Health Organisation in the recovery phase of the treatment of severe acute malnutrition (Briend *et al.*1999). The amount of RUTF a child should consume is determined by the need for an intake of about 200 kcal per kilogram of body weight per day (200 kcal /kg/day) and it is sufficient to begin the rehabilitation of a child with severe acute malnutrition.

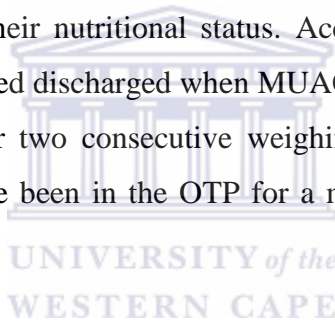
Meanwhile, the number of packets of RUTF consumed per day is based on the weight of the child; caregivers are given the RUTF ration card to guide on the number of packets to be consumed per day (Valid International, 2006). In the OTP, caregivers are advised to give RUTF to the child in small frequent amounts of up to eight times a day; they are also encouraged to allow their child to finish the entire allocated daily ration each day before giving other foods, but if the child is still breastfeeding, caregivers are advised to continue breastfeeding and to give RUTF after breastfeeding (Valid International, 2006).

Household food insecurity is common in homes of children with severe acute malnutrition; hence the weekly ration that is given to a child with severe acute malnutrition is shared at home with other family members henceforth depriving them of the required nutrients for rehabilitation. In order to improve the nutrition status of children with severe acute malnutrition in OTP in Ethiopia, additional supplementary rations (flour, oil and soap) were given to families of malnourished children to discourage sharing of RUTF at home so that the targeted child could reap the optimal benefits (Chaiken *et al.*,2006). When a child with severe acute malnutrition is a twin, the RUTF

supply is doubled to cater for both children to discourage sharing of the RUTF (Valid International, 2006).

### **6.1.1 Recovery Rates**

The findings of this study reported high recovery rate of 80 % above the accepted Minimum Sphere Standards of the Therapeutic Feeding Centres (The Sphere Project, 2011) thereby demonstrating that there was low treatment failure in the Outpatient Therapeutic Programme (OTP) due to improved management of severe acute malnutrition. The high recovery rates could also suggest that children with severe acute malnutrition were not fully cured, but just discharged from the OTP which could cause more relapse in the programme. It was therefore important to follow up children that were discharged to find out their nutritional status. According to the OTP guidelines, children in the OTP are supposed discharged when MUAC is above 11.5 cm, no presence of bilateral pitting oedema for two consecutive weighing, sustained weight gain; and clinically well and should have been in the OTP for a minimum of two months (Valid International, 2006).



The findings of this study concur with a study conducted by Bernal *et al*, 2008 to evaluate the implementation of the World Health Organization guidelines for the treatment of children with severe acute malnutrition in a third level hospital which specializes in management of severe malnutrition in children, the findings were that, children were discharged early due to cultural and socio - economical needs of the children's families and prolonged stay in the Inpatient Therapeutic Programme. In a well-functioning Outpatient Therapeutic Programme, children are discharged to the Supplementary Feeding Programme if they did not acquire infections and once discharged from the Supplementary Feeding Programme, Community volunteers followed them up for three consecutive weeks to ensure that they had completely recovered for them to be discharged.

### **6.1.2 Mortality Rates**

The mortality rate in this study was reported to be 2.8 % which is more than three times lower than the acceptable Minimum Sphere Standards for the Therapeutic Feeding Centers of less than 10 % (The Sphere Project, 2011). The mortality rate in this study was lower than the findings of the studies conducted by the National Food and Nutrition Commission of Zambia in 2006 which reported mortality rate of 31 %. Studies conducted in similar environments indicated that mortality rate had reduced to less than 5 % in both communities and health facilities with the use of current treatment procedures and improved access to treatment (WHO *et al*, 2007). The low mortality rate in children with severe acute malnutrition was attributed to improved case management and timely detection of cases since poor case management of severe acute malnutrition was associated with high mortality rates (Collins *et al*, 2006). The low mortality rates suggest that there was low treatment failure in the OTP due to improved management of severe acute malnutrition. There is need to strengthen community screening of oedema in children since in this study 55 % (130) of oedematous cases were admitted from the community while 45 % (108) were admitted from the health facilities.

### **6.1.3 Defaulter Rates**

The defaulter rate in this study was 17.2 % which was higher than the international accepted Minimum Sphere Standards for Therapeutic Feeding Centres which is less than 15 %, the defaulter rate in this study is not comparable with a study conducted on management of severe acute malnutrition in 21 programmes of Community based Therapeutic Care in Malawi, Ethiopia and Sudan between 2001 and 2005 which reported defaulter rate of 11.0 % (Collins, S & Sadler, K, 2002). The children who defaulted did not complete care as required for them to recover and if this was not checked mortality rates among the children admitted to the OTP rose. Some of the reasons cited from other literature for defaulting were RUTF stock out, lack of awareness about treatment length, caretaker falling sick, long waiting time at the OTP due to shortage of staff and wrong addresses provided such that children could not be easily followed up.

Defaulter rate is an indicator used to monitor the level of accessibility (distance of treatment from community) and acceptability (perceived quality of treatment) of the treatment in the OTP, hence high defaulter rate suggests that OTP was compromised (Gatchell, Forsythe & Thomas, 2005). The high defaulter rate combined with low mortality in OTP suggests that untraced defaulters may have died at home without being recorded since follow up of defaulters was not investigated in this study. High defaulter rate may also be as a result of unreported deaths and self-referral of patients to Inpatient Therapeutic Programme or migration of families before the next OTP session. In this study defaulter rate may have been over reported and probably death rates under reported.

#### **6.1.4 Average Weight Gain**

The average weight gain in this study was 10 g / kg / day higher than the internationally recommended Minimum Sphere Standard of 8 g / kg / day. The average weight gain of 10 g / kg / day concur with a study conducted by Collins *et al*, 2002 which indicated that Marasmic patients had adequate weight gain of 8 g / kg / day when Ready to Use Therapeutic Food was given as per OTP recommendation. A good weight gain reported in this study was consistent with recommendations that 200 kcal / kg / d of Ready to Use Therapeutic Food was expected to have weight gain of 10 g / kg / d.

However, this study did not report any weight gain in oedematous children because of the loss of oedema fluid in the body. The overall weight gain in this study could have been reduced due to the high proportion of children with oedema whom at the point of oedema loss, were not wasted and this was consistent with other OTP Centres that had treated large proportions of oedematous children. It is essential to note that low weight gain and slower recovery rates has an impact on the cost of the OTP delivery since more Ready to Use Therapeutic Food and other resources are required to maintain the patients. The findings of this study concur with Collins *et al*, 2002 who reported that more than 25 % of marasmus patients had an average weight gain of 8 g / kg / d when Ready to Use Therapeutic Food was given as per OTP recommendation.



The good weight gain in this study could have been a result of the strict adherence of caregivers to the guidelines on feeding children with Ready to Use Therapeutic Food which was high in calories coupled with family diet. Good weight gain in children with severe acute malnutrition in inpatient treatment of severe acute malnutrition depends mainly on staff adhering to feeding protocols but staff shortages in hospitals contribute to non-adherence to feeding protocols hence weight gain is compromised in children with severe acute malnutrition. Puoane *et al*, 2004 reported that inpatient management of severe acute malnutrition experienced challenges in feeding children in the ward due to inadequate staff, thereby contributing to failure to gain weight

#### **6.1.5 Average Length of Stay**

The average length of stay to recover in this study was 44 days, it concurred with the study conducted by Collins *et al*, 2006 which reported that, the average length of stay to recovery for children with severe acute malnutrition was reduced if rehabilitation was done at home while nutrition and clinical monitoring, nutrition education and promotion was conducted once in a week at a health facility. The longer stay of patients in the OTP indicates poor monitoring of patients and inadequate adherence to discharge protocol. The consequence of late discharge of patients from the OTP is the cost involved, though this study did not investigate this aspect. The average length of stay in Outpatient Therapeutic Programme for children admitted with Mid-Upper-Arm Circumference (MUAC) < 11.5cm was 50 days compared with children admitted with oedema at 35 days, however, this study did not investigate the causes of differences in the average length of stay to recover between those admitted with MUAC and oedema.

Meanwhile, the internationally recommended length of stay in Therapeutic Feeding Centres according to the Minimum Sphere Standards is 60 days, but in the OTP, children with severe acute malnutrition are not removed from their home environment so the exposure to infections is lower than in Inpatient Therapeutic Programme. In some cases, Health workers did not follow the OTP guidelines hence malnourished children stayed longer in the OTP due to lack of knowledge on the discharge criteria hence staff must be

regularly updated with protocols on management of severe acute malnutrition in order to be abreast with OTP.

## **6.2 Knowledge and Practices of health personnel**

The study findings of key informants revealed that health workers and stakeholder were knowledgeable about management of SAM in the Outpatient Therapeutic Programme.

### **6.2.1 Knowledge on Service Provision**

The findings of this study found that Outpatient Therapeutic Programme (OTP) staff at all levels of implementation were oriented in OTP activities and were aware of the admission and discharge criteria implying that knowledge and practices on OTP was imparted during orientations. The findings concur with World Health Organisation recommendations on capacity building to equip and impart knowledge and skills to both Health workers and Community volunteers in OTP for attainment of desired programme outcomes (WHO *et al*, 2007). Studies conducted by Collins *et al* in 2006 indicated that health worker trainings in nutrition programmes requires national planning so that they are incorporated into existing medical and nursing curricula of health training institutions. There is also evidence that once Health workers are trained and provided with necessary equipment, there is a change in the way they perceive and manage severe acute malnutrition (Ashworth *et al*, 2004).

The high recovery rate and low mortality rate in this study could be attributed to staff orientations that were conducted. Meanwhile, refresher courses to update OTP staff and Community volunteers on new developments in OTP implementation is vital for management of severe acute malnutrition, defaulter tracing and timely detection of severe acute malnutrition in communities. Inadequate knowledge coupled with limited resources (human, financial and material) were reported to be the greatest barriers in implementing Inpatient Therapeutic Programme management of severe acute malnutrition. Once capacity was built in staff treating severe acute malnutrition, a reduction in case fatality was recorded (Puoane *et al*, 2004). Since human resource is limited, OTP requires at least one trained Health worker who is able to screen children, have them registered and give

medication while the rest of the workers could be Community volunteers though both trained staff and Community volunteers need be trained in OTP to enhance their knowledge and skills in management of severe acute malnutrition and to motivate them to follow the OTP protocols and procedures for attainment of desired programme outcomes. It is assumed that if Health workers and Community volunteers strictly adhere to the OTP protocols and procedure; mortality rates are likely to reduce in the OTP.

### **6.2.2 Programme Linkages**

The findings of this study reported linkages of Outpatient Therapeutic Programme (OTP) with livelihood and nutrition programmes after discharge. The Food Security Pack (FSP) is the only livelihood programme linked to the OTP while Growth Monitoring and Promotion (GMP) and Supplementary Feeding Programme are the nutrition programmes linked to the OTP linkage assist in increasing programme coverage, effectiveness; strengthen service provision as well as resource leveraging. Malnutrition is a cross cutting problem which requires a multi sectorial approach, thus need to promote more linkages with livelihood and nutrition programmes. It is vital for nutrition programmes to be implemented in a sustainable approach at community level by linking them to health services within the health system (Gatchell *et al*, 2006).

In order to promote programme linkages, there is need to have a deliberate policy on multi sector planning when developing programmes which will allow all key players in nutrition to be involved from the planning stage instead of requesting stakeholders to join midway. Apart from programme linkages, if planning is done in a multi sector mode there is a possibility of leveraging of resources in some of the activities as it promotes joint monitoring as well.

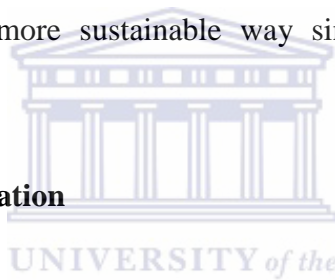
### **6.2.3 Community Mobilisation**

The findings of this study reported that there was adequate community mobilisation which could have contributed to high recovery rates and low mortality rates. Other studies revealed that the success of OTP depends on the quality of engagement with

communities with a purpose of community buy in, case detection, referral of cases to health facilities; follow up of cases after discharge and community mobilisation (Guerrero, S, Myatt, M, Collins, S, 2009). However, it is recommended that in order to sustain community involvement, local leaders must be engaged first before the community members since community leaders provide direction and guidance to the community.

It is recommended that OTP are tailored to specific situations and local people are actively involved in the programme design in order to take care of community cultural aspects as well as community participation (Collins, S, 2001). The inclusion of communities in OTP design encourages programme ownership and participation. Meanwhile, there is also need to discuss with the communities on how to motivate Community volunteers in a more sustainable way since the thrust of the OTP is community participation.

#### **6.2.4 Monitoring and Evaluation**



Although Outpatient Therapeutic Programme (OTP) activities were monitored regularly, information sharing after monitoring between the District Medical Officers and the OTP staff was inadequate. The findings in this study does not concur with studies that reported that monitoring helped in identification of weaknesses and strength in programme implementation and hence feedback from monitoring was vital for correction of implementation inadequacies as well as tracking of events. Studies have reported that inadequate sharing of monitoring information contributed low detection of defaulters in the OTP since monitoring assists in tracking programme objectives and outcomes (Feuerstein, D., 1986).

Meanwhile, care has to be taken when selecting the mode of sharing information with OTP Center staff since monitoring focuses on collecting, managing and utilizing data and at the same time identifies programme weaknesses and strengthens (UNICEF, 2008). The findings of this study indicated that the most preferred mode of sharing information after

monitoring was through review meetings. Review meetings are not a very effective way of information sharing since they are held quarterly, biannual or annually thereby delaying the correction of situation. It is therefore recommended that information gathered during monitoring is shared with staff immediately after technical support supervision has been provided. Studies have reported that supervising trained Health Workers with the view of them adhering to standardized protocols is directly associated with a major reduction in case fatality rate in children with severe acute malnutrition (Biai *et al*, 2007).

### **6.2.5 Financial Resources**

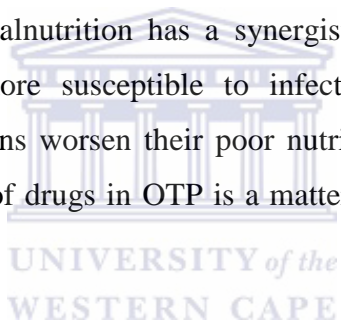
In this study, the findings reported that Outpatient Therapeutic Programme (OTP) activities were included in the annual action plan to enable staff access funds for programme implementation. The findings of this study were not comparable with other studies in that OTP centres were mainly supported by donors and not the government. The inclusion of OTP activities in the annual action plan promotes ownership and programme sustainability once internally funded by the government unlike when the programme depend on external funding (Sanders, 1999). The OTP components (trainings, monitoring and review meetings) that were planned are vital in improving the quality of service provision.

### **6.2.6 Ready to Use Therapeutic Food, Supplies and Drugs**

The findings of this study reported that the supply chain for Ready to Use Therapeutic Food (RUTF), supplies and drugs were compromised hence experiencing consistent stock outs. The findings were not comparable with a study conducted by Gatchell *et al*, in 2005 which revealed that for the Outpatient Therapeutic Programme (OTP) to operate effectively, supply chain for RUTF, drugs and supplies must be regular. The stock out of RUTF, drugs and supplies affected the provision of quality services thereby contributing to high defaulter rates in the OTP. The compromised supply chain could have also contributed to clients not gaining weight and the prolonged length of stay in the OTP.

Failure to gain weight in OTP due to RUTF stock out should not be allowed to occur since malnourished children are undergoing rehabilitation and that is the time they need constant flow of nutrients to build up the stores that were lost. The stock out of RUTF is the key reason for relapses in children with severe acute malnutrition. The prolonged stay in the OTP has a cost implication since more RUTF is needed to keep the child with severe acute malnutrition in the OTP and there are higher chances of the care giver defaulting from the OTP. The credibility of the OTP it is community driven and once clients who visit the health facility are unable to collect their allocation of RUTF due to stock out, they might not come back since most of them maybe walking very long distances.

The findings of this study reported stock outs of drugs (Antibiotics, Vitamin A, and Mebendazole) in the OTP. Malnutrition has a synergistic relationship with infection; malnourished children are more susceptible to infections since their immunity is compromised, and the infections worsen their poor nutritional status (Scrimshaw. N.S, 2003). Therefore, availability of drugs in OTP is a matter of urgency if mortality has to be reduced.



Equally, Outpatient Therapeutic Programme supplies (MUAC tapes, salter scales and monitoring tools) were reported to be out of stock most of the time. Non availability of supplies compromises the implementation of the OTP in that the protocols and procedures are not followed. It is therefore important for the OTP managers to plan for the Outpatient Therapeutic Programme supply prior to opening the OTP.

### **6.2.7 Human Resources**

The findings showed that apart from Health workers, Officers from other government line ministries were involved in Outpatient Therapeutic Programme (OTP) activities demonstrating that activities were conducted in a multi sector approach. Meanwhile, the findings reported high Community volunteer dropout which is consistent with the anecdote reports on Community volunteer dropout in OTP because of lack of motivation.

The findings also concur with studies conducted by Collins *et al* in 2006 which reported that availability of adequate, highly motivated skilled staff contributes to the effectiveness in implementation of nutrition programmes. Similar studies were conducted and the findings indicated that shortage of skilled motivated staff has a negative effect on sustainable implementation of World Health Organisation guidelines on management of severe acute malnutrition (Collins *et al*, 2006). The World Bank has also reported that lack of skilled human resource has contributed to a reduction in health outcomes (World Bank, 2004). Since skilled human resource is a major constraint in Zambia, the chances of attaining the Millennium Development Goals on two third reduction in childhood mortality unless management of severe acute malnutrition is given a priority.

In case of the Zambian situation, health facilities are understaffed and in rural areas, untrained Health workers operate them. The shortage of trained staff and use of untrained staff has a negative effect on OTP implementation hence the need to train stakeholders in OTP activities to take care of shortage of staff. The high Community volunteer dropout can be directly associated with poor implementation since the OTP is highly dependent on community participation. The high defaulter rates reported in this study could be linked to high Community volunteer dropout. It is vital to investigate the best possible sustainable ways of motivating volunteers since they play a vital role in OTP activities.

### **6.2.8 Programme Coordination**

The presence of a coordinator at all levels of Outpatient Therapeutic Programme (OTP) implementation demonstrates that key players in the programme own the programme. However, even if there were programme coordinators at all levels of implementation, lapses in roles and responsibilities were noted as evidenced by stock out of Ready to Use Therapeutic Food, drugs and supplies. The programme coordinators should ensure that all systems in implementation of the OTP were in place according to set plans. The availability of a programme coordinator who has no focus will not contribute to the reduction in childhood mortality in the OTP. There was need to build capacity of



programme coordinators in form of skills and knowledge with the aim of reducing mortality in the OTP.

### **2.2.9 Capacity Building**

The findings of this study showed that Health worker and Community volunteer trainings were conducted and monitoring of activities was conducted in OTP facilities signifying that capacity building was done. The findings were in agreement with studies that indicated that Health workers and Community volunteers need to be equipped with skills and knowledge on monitoring and implementation in order to achieve desirable OTP outcomes (WHO *et al*, 2007). Capacity building of all staff promotes sustainability in nutrition programming (Gatchell, Forsythe & Thomas, 2006).

In case of Zambia, training of Health workers in nutrition programmes requires national planning and support so that they are incorporated into existing medical and nursing curricula of health training institutions (Collins *et al*, 2006). Capacity building in form of human resource development was identified as one of the factors that contributed to low mortality rates in a study conducted to evaluate the implementation of World Health Organisation guidelines in Colombia (Bernal *et al*, 2007). It is assumed that staff trainings in management of severe acute malnutrition improve staff knowledge and skills thereby reducing case mortality. In a case when staff is not trained, health workers tend to stick to out-dated guidelines thereby putting children with severe acute malnutrition at risk of death due to poor management. The other aspect of capacity building that is essential in the operation of Outpatient Therapeutic Programme is systems development such as Ready to Use Therapeutic Food and drug supply chain; and monitoring and evaluation. Capacity development in supply chain management, monitoring and evaluation will reduce stock out of Ready to Use Therapeutic Food and drugs and the tracking of children in the programme will also be improved.



### 6.3 Study Limitations

1. The Mid-Upper-Arm Circumference and weight of study participants was taken by different Community volunteers each time they attended the Outpatient Therapeutic Programme thereby increasing the inaccuracies in measurements
2. The Mid-Upper-Arm Circumference and weight of study participants in the Outpatient Therapeutic Programme were taken once each week and not necessarily at the same time of the day thereby increasing the inaccuracies in measurements
3. The screening of oedema was done by Community volunteers who did not grade the oedema. In the study, the different types of oedema were graded only as oedema.
4. There was high Community volunteer and Health worker turnover in the programme therefore it was difficult to find all the key informants to be interviewed in the study
5. Data collection was delayed by one year due to long procedure and requirements by the University of Zambia Biomedical Ethics committee so it was difficult to proceed according to the initially planned time frame.
6. The study was conducted in the three districts conducting Outpatient Therapeutic Programme, only one health facility per district participated in this study.
7. The sample size in this study was small since only one health facility per district participated in this study.
8. There were few providers that participated in this study
9. There was no use of vignettes and exit interviews to assess knowledge and practices in this study.

# Chapter Seven: Conclusion



## Chapter Seven

### 7.0 Conclusion

The Outpatient Therapeutic Programme (OTP) management of severe acute malnutrition without medical complications is effective in reducing case fatality rates and improving health outcomes (Recovery and mortality rates, average weight gain and average length of stay to recover in the programme) in the three districts of Eastern Province. Although four out of the five OTP outcomes were within the recommended Minimum Sphere Standards, defaulter rate was not within the recommended Minimum Sphere Standards and this presents a challenge to the OTP in terms of acceptability and accessibility. More work is required to determine if those that defaulted managed to recover or died. The factors contributing to high defaulter rates need to be considered so as to prevent defaulting.

The quality of community engagement is an essential success factor to the success of the programme since community mobilization is vital for attainment of desired OTP outcomes. The OTP depends on Community volunteers to mobilize communities, timely case identification, referral of cases and defaulter tracing hence extra work is required to reduce Community volunteer dropout from the OTP. Additional work is required to promote OTP linkages to both health and livelihood programmes that promote sustainability. A viable monitoring and evaluation system is vital in tracking OTP activities and the information collected during monitoring must be shared with staff in order to improve the provision of services. For the OTP to be sustainable, constant availability of Ready to Use Therapeutic Food and supplies need to be strengthened at all levels of implementation.

# Chapter Eight:

# Recommendations



## Chapter Eight

### 8.0 Recommendations

1. The Outpatient Therapeutic Programme (OTP) management of severe acute malnutrition (SAM) without medical complications must be scaled up within the three districts and within the province since the study findings confirmed that all the programme outcomes except for defaulter rate were within the internationally acceptable Minimum Sphere Standards for Outpatient Therapeutic Feeding Centre.
2. District Medical Offices in the programme areas must conduct a defaulter tracing study so as to determine the status of defaulters and investigate reasons for defaulting
3. District Medical Offices in the programme areas must develop a sustainable uniform package for motivating Community volunteers in the OTP with the aim of reducing Community volunteer drop out.
4. District Medical Offices in the programme areas must ensure that Ready to Use Therapeutic Food, drugs and supplies are in constant supply to the OTP Centres to avoid stock outs which compromise the quality of service provision
5. Since there is a high Health worker and Community volunteer turn over, there is need to conduct trainings and refresher trainings for both staff on the OTP activities.
6. The OTP should be integrated and linked to curative, preventive, promotive child survival and livelihood programmes to maximize coverage and resource leverage.
7. District staff monitoring the OTP Centres must share their findings with the OTP Centre staff each time they monitor the programme. This ensures that identified problems are shared and attended to by the relevant staff.

8. The OTP should be integrated into the pre and in-service trainings of health professionals training institutions and in refresher training of community health extension workers



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## Annexes

### Annex 1: Data Compilation Form at the OTP

Province _____	District: _____	OTP/ H Centre: _____
Child Identity No: _____	Date of admission to OTP: _____	
Residential Area: _____	Age of child at admission: _____	Sex of Child: 1. Female 2. Male
1. Referral for Direct and Voluntary Counselling and Testing	1. Yes      2. No	3. Not Indicated
2. Prophylaxis      1. Mother 2. Child	1. Yes      2. No 1. Yes      2. No	3. Not Indicated 3. Not indicated
3. Place of admission:	1. Community    2. Health Centre	3. ITP Centre 4. Not Indicated
4. Relapse (Readmission)	1. Yes      2. No	3. Not indicated
5. Anthropometry at admission Oedema MUAC Weight Height Weight for height	1. Yes      2. No [_____] cm [_____] kg [_____] cm [_____] %	
6. Admission criteria in the programme Oedema MUAC < 11.5cm (Between 6-59 month) < 70% Weight for height Medical Assessment	1. Yes      2. No 1. Yes      2. No 1. Yes      2. No 1. Yes      2. No	3. Not Indicated 3. Not Indicated 3. Not Indicated 3. Not Indicated
7. Discharge criteria in the programme Oedema MUAC Weight for height Medical Assessment	1. Yes      2. No 1. Yes      2. No 1. Yes      2. No 1. Yes      2. No	3. Not Indicated 3. Not Indicated 3. Not Indicated 3. Not Indicated

Patient Follow up: Outpatient Therapeutic Programme																		
Week	Admission	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Date																		
8. Oedema (+, ++, +++)																		
9. MUAC (cm)																		
10. Weight (kg)																		
11. Weight Loss (Y/N)																		
12. Height (cm)																		
13. % of weight/																		

Height																		
14. Outcome (Death, default, Cured)																		
15. Length of stay in the OTP programme in days _____																		
16. Transferred to ___: 1. Stabilisation Centre      2. Supplementary Feeding Programme      3. Other Specify: _____																		

**Observe on the OTP Card if the following were followed up in the programme:**

17. Cases of failure to recover were followed up in the programme \_\_\_\_\_
18. Defaulter cases were followed up in the programme \_\_\_\_\_
19. Cases of failure to gain weight were followed up in the programme. \_\_\_\_\_

**Annex 2: OTP Centre Staff Questionnaire**

(Trained Health Worker, Community Development Officer, Agriculture Officer and Community Health Worker)

Name of Province: \_\_\_\_\_ District: \_\_\_\_\_

OTP/Health Centre: \_\_\_\_\_ Designation: \_\_\_\_\_

**1.0 Service Provision**

1. How long (Months) have you worked in the OTP Centre? *(Circle that applies)*
  1. Less than 3months
  2. Between 3 and 6 months
  3. More than 6 months
  
2. How many people were oriented/trained in OTP programme at this facility *(Circle all that applies)?*
  1. Health workers \_\_\_\_\_
  2. Community volunteers \_\_\_\_\_
  3. Agriculture officer's \_\_\_\_\_
  4. Community Development Officer \_\_\_\_\_
  9. Other, (Specify) \_\_\_\_\_
  
3. How many people currently work at this OTP facility? \_\_\_\_\_
  
4. What criteria do you use to admit clients into the Programme? )  
 \_\_\_\_\_  
 \_\_\_\_\_
  
5. Are there clients that have defaulted from the programme?
  1. Yes
  2. No      *If No, Go to question 8*
  
6. Why do clients default from the OTP programme?  
 \_\_\_\_\_  
 \_\_\_\_\_
  
7. Are there children who fail to attain adequate weight gain in the programme?
  1. Yes
  2. No







### Annex 3: OTP Centre District Staff Questionnaire

(Officers in charge of nutrition at district level from Agriculture and Community Development)

Province: \_\_\_\_\_ District: \_\_\_\_\_  
Department \_\_\_\_\_ Designation: \_\_\_\_\_

#### 1.0 Knowledge about Nutrition

1. Were you trained in Outpatient Therapeutic (OTP) Programme?

1. Yes

2. No

*If No, Go to sec 2.0*

2. Do you participate in OTP activities at the health Centre?

1. Yes

2. No

*If No, Go to Question 2*

3. Is there a criterion used to admit clients in the OTP programme?

1. Yes

2. No

4. If yes, what criteria are used to admit clients into the OTP Programme?

---

5. Do you have a criterion used to discharge children from OTP Programme? 1. Yes

2. No

#### 2.0 Linking with Livelihood programmes

1. Does the Health Centre refer clients on the programme to livelihood programme?

1. Yes

2. No

*If No, Go to section 3*

2. If Yes, What livelihood programme are linked to the OTP programme?

---

#### 3.0 Community Mobilisation

1. Has the community been involved in the OTP programme?

1. Yes

2. No

*If No Go to Quest 3.*

2 If yes, how is the community involved in the OTP programme?

---

3. Do you experience interruptions in the RUTF supply chain due to stock outs?

1. Yes

2. No

*If No, Go to section 4*

4. Why do you experience RUTF Stock outs at the OTP facility?

---

**4.0 Community Volunteers**

1. Are there volunteers that have dropped out from the OTP programme? 1. Yes 2. No

2. If Yes, Why did volunteers drop out from the programme?

---

3. Do you have a person coordinating the OTP activities at the district health office?  
1. Yes 2. No

**Annex 4: OTP District Health Staff Questionnaire**

*(District Medical Officer, Nutritionist and Manger Planning)*

Province: \_\_\_\_\_ District: \_\_\_\_\_ Designation: \_\_\_\_\_

**1.0 Nutrition Services Provided**

1. Were you trained in the Outpatient Therapeutic (OTP) Programme?  
1. Yes 2. No *If No, Go to Question 3*

2. Do you participate in OPT activities at the health Centre *(Circle that applies)*  
1. Yes 2. No

3. Is there a criterion for admitting children in the OTP programme?  
1. Yes 2. No

4. If yes, what criteria do you use to admit children in the Programme?

---

---

5. If yes, what criteria do you use to discharge clients from the programme?

---

---

**2.0 Linking With Livelihood and Health/Nutrition Programme**

1. Does your facilities refer clients in the OTP programme to livelihoods programmes?  
1. Yes 2. No *If No, Go to question 3*

2. What livelihood programme are linked to the IMAM programme?

---

3. Have you referred any clients to any health programme?  
1. Yes 2. No

4. If Yes, Which health programme are linked to OTP programme

---

**3.0 Community Mobilisation**

1. Has the community been involved in the IMAM programme?  
1. Yes 2. No

2 If yes, what is the community's involvement in IMAM programme

---

### 3.0 Community Volunteers

1. Are there volunteers that have dropped out from the IMAM programme?

1. Yes

2. No

2. If Yes, Why do volunteers drop out from the programme

---

### 5.0 Monitoring and Evaluation

1. Are you involved in monitoring the programme activities?

1. Yes

2. No

If No Go to section 7

2. What type of information is collected during monitoring? (Circle all that apply)

---

3. How is the information monitored shared among the staff: \_\_\_\_\_

4. Is a monitoring plan available at the district health office?

1. Yes 2. No

### 6.0 Funding

1. Is the OTP programme included in the District action plan?

1. Yes

2. No

If No, Go to Section 7.0

2. What OTP components did you plan for in the action plan \_\_\_\_\_?

3. Do you receive any external support for the OTP programme

1. Yes

2. No

If No, Go to section 7

4. What components are supported financial or technically externally

### 7.0 Equipment's and Drugs

1. Do you experience stock outs of RUTF supply?

1. Yes

2. No.

If No, Go to Question 3

2. Why do you experience RUTF Stock outs at the OTP facility?

3. Do you experience stock outs of equipments/supplies for the programme?

1. Yes

2. No.

If No, Go to Question 5

4. If yes, list equipments/supplies in short supply: \_\_\_\_\_

5. Do you experience stocks outs of drugs for the OTP programme?

1. Yes

2. No

If No, Go to Question 7

6. If yes, list drugs in short supply; \_\_\_\_\_

---

7. Why do you experience shortages of drugs/medicines for the OTP programme?

8. Do you have a person coordinating the OTP activities at this OTP centre?)

1. Yes

2. No

#### Annex 5: Consent Form

### **Study Title: Evaluation of Outpatient Therapeutic Programme for Management of Severe Acute Malnutrition in three districts of Eastern Province, Zambia**

I have read the information sheet concerning this study and I understand what will be required of me and what will happen to me if I take part in it. I further understand that at any time I may withdraw from this study without giving any reason and without affecting my normal care and management.

I agree to take part in this study

Yes \_\_\_\_\_

No \_\_\_\_\_

I agree that any information from my interview may be used in this study

Yes \_\_\_\_\_

No \_\_\_\_\_

I am aware that I will not be mentioned by name in this study, but my role in the implementation of the Outpatient Therapeutic Programme may be mentioned.

Yes \_\_\_\_\_

No \_\_\_\_\_

Signed \_\_\_\_\_ Thumb print \_\_\_\_\_

Date \_\_\_\_\_

For further information about this study, please contact the following:

The Chairperson  
University of Zambia Biomedical Research Ethics Committee  
Ridgeway Campus  
P.O.BOX 50110  
Lusaka, Zambia  
Telephone Number: 211 – 256067  
Email Address: unzarec@unza.zm

Principal Investigator (PI): Mike Mwanza  
National Food and Nutrition Commission of Zambia  
Lumumba Road, P.O. Box 32669  
Lusaka, Zambia  
Telephone Number: 211 – 227803 or 211 – 221426  
Mobile Numbers: 0979158899 or 0965885816  
Email Address: [mikemwanza@gmail.com](mailto:mikemwanza@gmail.com) or [mikemwanza@hotmail.com](mailto:mikemwanza@hotmail.com)

## Annex 6: Information Sheet

**Study Title:** Evaluation of the Outpatient Therapeutic Programme (OTP) for Management of Severe Acute Malnutrition in three districts of Eastern Province, Zambia

**Introduction:** Mike Mwanza is a Masters student of Public Health at the University of the Western Cape in South Africa. He is currently conducting a study to obtain his Master's Degree qualification.

**Purpose:** The purpose of the study is to assess the effectiveness of the Outpatient Therapeutic Programme (OTP) for management of severe acute malnutrition (SAM) in three districts (Chipata, Katete and Petauke) of Eastern province in reducing case fatality rates (CFR). It aims to provide programmatic recommendations for change or lessons to adopt by program staff to effectively implement large scale OTP Programs that attempt to deliver high number of health and nutrition service interventions.

**Participation:** Your participation in this study is entirely voluntary and you may withdraw at any time without giving reason. If you choose to take part in this study, you will be asked to sign a consent form and will be interviewed by the Research Assistant. A questionnaire will be used by the Research Assistant to collect information during the interview which might take 15 minutes of your time.

**Discomfort:** There could be some sensitive questions and you may stop the interview at any time or decline to answer any questions.

**Benefits:** The study may help identify strengths and weaknesses of current OTP program implementation that may benefit children with Severe Acute Malnutrition. It will also help Program staff perform more efficiently and effectively in the implementation of the OTP Program.

**Confidentiality:** The Researcher will be responsible for confidentiality. He will keep all the records and consent forms in a locked and secured area and no one will be allowed to see the records. The research data will be kept 10 years after the completion of the study, including consent forms and collected data such as interview recordings, notes, and other relevant data gathered. All information will be kept anonymous and confidential unless the participants authorise the Researcher that he may use the information in her report.

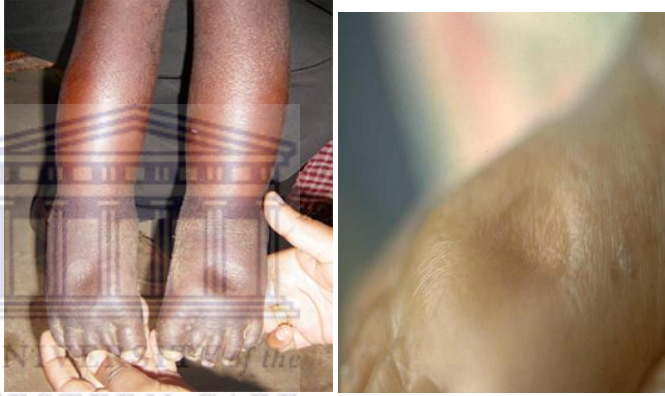

**Compensation:** You will not receive any compensation for participating in this study. Your participation is completely voluntary.

For further information about this study, please contact the following:

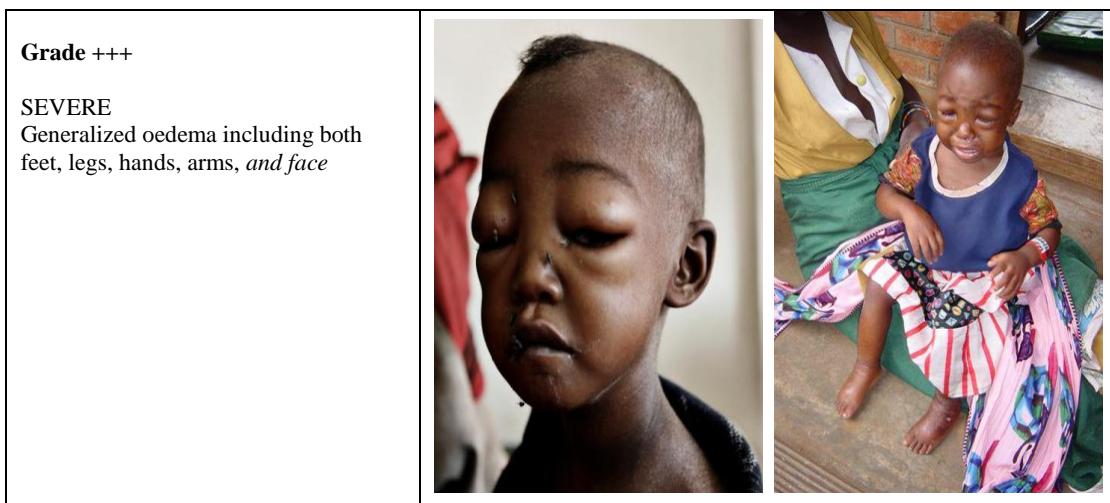
The Chairperson  
 University of Zambia Biomedical Research Ethics Committee  
 Ridgeway Campus, P.O.BOX 5011, Lusaka, Zambia  
 Telephone Number: 211 – 256067; Email Address: [unzarec@unza.zm](mailto:unzarec@unza.zm)

Principal Investigator (PI): Mike Mwanza  
 National Food and Nutrition Commission of Zambia, Lumumba Road, P.O. Box 32669, Lusaka,  
 Mobile Numbers: 0979158899 or 0965885816  
 Email Address: [mikemwanza@gmail.com](mailto:mikemwanza@gmail.com) or [mikemwanza@hotmail.com](mailto:mikemwanza@hotmail.com)

Annex 7: Nutritional bilateral oedema

Bilateral Pitting Oedema	
Grade of Oedema	Definition
<b>Grade 0</b>	<b>Absent</b>
<b>Grade +</b>  MILD Both feet/ankles	
<b>Grade ++.</b>  MODERATE Both feet, plus lower legs, hands, or lower arms	





Annex 8: Medications to be given at admission of OTP

Name of Product	Drug of Choice	Age / Weight	Prescription/ Dose
<b>ROUTINE IMMUNISATIONS</b> (+ Do not give live vaccines to children with symptomatic HIV)	Measles vaccine (unless evidence of vaccination) + Other childhood vaccines	$\geq 6$ months  All eligible children	Check Under 5Card  Follow National Protocol
<b>ANTIBIOTIC*</b>	Amoxicillin	All new admissions to OTP Children $>2$ kg	Follow National Protocol 50-100 mg/kg/day
<b>ANTI-MALARIA</b> according to National Protocol	Coatem	All eligible children $\geq 5$ kg	Follow National Protocol
	Fansidar	All eligible children Less than 5kg	
<b>VITAMIN A**</b>  <b>Do NOT give to children with oedema. It may be given when oedema has resolved</b>	Vitamin A 100,000 IU	6-11 months	Immediately as a single dose
	Vitamin A 200,000 IU	$(or < 8kg)$ $\geq 12$ months	Follow National Protocol

\* ANTIBIOTIC: If cotrimoxazole prophylaxis is indicated it should be given in addition to amoxicillin.

\*\* VITAMIN A: Give stat dose if not received within the last 1 month or at the ITP

<i>Medicines given in 2<sup>nd</sup> week of visit</i>			
Name of Product	Drug of Choice	Age / Weight	Prescription/ Dose
Treat anaemia	Folic acid*	All eligible children	5 mg
Anthelminthic (Deworming)	Mebendazole	> 1yr	Immediately as a single dose 500 mg
Do <b>NOT</b> give to children under 1 year.	Albendazole	> 1 year	Immediately as a single dose 400 mg

Annex 9: OTP RUTF Ration Chart (based on 175 - 200 kcal/kg Bodyweight/Day)

Weight (kg)	RUTF (PlumpyNut)*	RUTF (PlumpyNut)*
	Sachets per day	Sachets per week
3.5 – 3.9	1.5	11
4.0 – 4.9	1.75	12
5.0 – 5.9	2	14
6.0 – 6.9	2.5	17
7.0 – 7.9	3	20
8.0 – 8.9	3.25	23
9.0 – 9.9	3.75	26
10 – 11.9	4	28
12 - 14.9	5	35
15 - 19.9	6.5	45
20 - 24.9	8.5	60
25 - 29.9	To be calculated	To be calculated
30 - 39.9	To be calculated	To be calculated

Weight (kg)	RUTF (PlumpyNut)*  Sachets per day	RUTF (PlumpyNut)*  Sachets per week
40 - 60	To be calculated	To be calculated

\*175-200 kcal/kg/day



Annex 10: Outpatient Therapeutic Programme Ration Card

Outpatient Therapeutic Programme		/ / / OTP			
NAME of CHILD					
ADMISSION CRITERIA	OEDEMA	MUAC <11.5cm	Visible severe wasting	<3 W/H (if height used)	
	AGE (months)	SEX		M	F
Date	Oedema (N or + ++ +++)	MUAC (cm)	Weight (kg)	Height (cm) (if used at clinic)	RUTF (# units given)

<b>Notes:</b>				
OUTCOME:	Cured	Transferred	No response	Dead
OUTCOME:	Cured	Transferred	No response	Dead

Date	Oedema (N or + ++ +++)	MUAC (cm)	Weight (kg)	Height (cm) (if used at clinic)	RUTF (# units given)
<b>Notes:</b>					
OUTCOME:	Cured	Transferred	No response	Dead	
<i>Comments / Home visits</i>					

Annex 11: Key Messages for OTP on the use of RUTF for the caregiver



1. **Breastfeeding is best** – and first.  
For infants and young children, continue to put the child to the breast regularly.
2. **RUTF should not be shared.**  
It is a food and a medicine for the malnourished child only.
3. **Give small amounts and often.**  
Sick children often do not like to eat. Give small regular meals of RUTF and encourage the child to eat often (if possible 8 meals a day). RUTF can be left for later if not finished, and be eaten during the course of the day.
4. **Give RUTF before any other foods (except for breast-milk).**  
RUTF is the only food the child needs in order to recover. Other foods should only be offered after RUTF.

5. **Offer safe clean water.**

Always offer plenty of clean water to drink while he or she is eating the RUTF.

6. **Wash before eating.**

Use soap for children's hands and face before feeding if possible.

7. **Keep food clean and covered.**

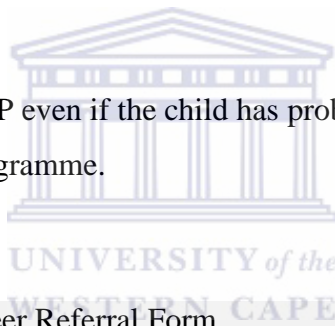
8. **Open sachets of RUTF need to be consumed within 12 hours after opening** (if they are kept in a clean, covered place)

9. **Give RUTF even if child is ill or has diarrhea.**

When taking RUTF, the stools of the child may change. This is normal. When a child has diarrhea, never stop feeding. Give extra food and extra clean water and breastmilk.

10. **Come to the OTP.**

Continue coming to the OTP even if the child has problems, or if he/she starts participating in another programme.



Annex 12: Community Volunteer Referral Form

Referral Form						
Patient Name			Patient Age		Name Mother/Caregiver	
Date of Evaluation	(day)	(month)	(Year)	Name of Community		
MUAC (circle one)	Red	Yellow	Green	Oedema (circle one)	Yes	No
Referral From (Community Name)						
Referral To (health centre or hospital name)						
Other findings						

Community Volunteer Name	Community Volunteer Signature
--------------------------	-------------------------------



Annex 13: Approval to conduct a study: Research Ethics Committee of UWC

UNIVERSITY OF  
WESTERN CAPE

**OFFICE OF THE DEAN  
DEPARTMENT OF RESEARCH  
DEVELOPMENT**

Private Bag X17, Bellville 7535  
South Africa  
Telegraph: UNIBELL  
Telephone: +27 21 959-2948/2949  
Fax: +27 21 959-3170  
Website: www.uwc.ac.za

20 May 2011

**To Whom It May Concern**

I hereby certify that the Senate Research Committee of the University of the Western Cape has approved the methodology and ethics of the following research project by:  
Mr M Mwanza (School of Public Health)

Research Project:

Evaluation of the outpatient therapeutic programme for management of severe acute malnutrition in three districts of Eastern Province, Zambia.

Registration no:

11/4/12



*Ms Patricia Josias  
Research Ethics Committee Officer  
University of the Western Cape*

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WESTERN CAPE**

A place of quality, a place to grow, from hope to action through knowledge

Annex 14: Approval from University of Zambia Research Ethics Committee



THE UNIVERSITY OF ZAMBIA

BIOMEDICAL RESEARCH ETHICS COMMITTEE

Telephone: 260-1-256067  
Telegrams: UNZA, LUSAKA  
Telex: UNZALU ZA 44370  
Fax: + 260-1-250753  
E-mail: unzarec@unza.zm  
Assurance No. FWA00000338  
IRB00001131 of IORG0000774

Ridgeway Campus  
P.O. Box 50110  
Lusaka, Zambia

16<sup>th</sup> March, 2012.

Your Ref: 004-09-11.

Mr. Mike Mwanza,  
Food and Nutrition Commission,  
PO Box 32669,  
**Lusaka.**

Dear Mr Mwanza,

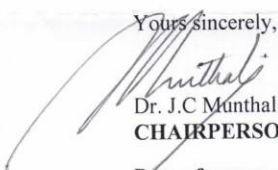
**RE: RE-SUBMITTED RESEARCH PROPOSAL: "EVALUATION OF THE  
OUTPATIENT THERAPEUTIC PROGRAM FOR MANAGEMENT OF SEVERE  
ACUTE MALNUTRITION IN THREE DISTRICTS OF EASTERN PROVINCE,  
ZAMBIA"**

The above mentioned research proposal was re-submitted to the Biomedical Research Ethics Committee with recommended changes on 13<sup>th</sup> March, 2012. The proposal is approved.

**CONDITIONS:**

- This approval is based strictly on your submitted proposal. Should there be need for you to modify or change the study design or methodology, you will need to seek clearance from the Research Ethics Committee.
- If you have need for further clarification please consult this office. Please note that it is mandatory that you submit a detailed progress report of your study to this Committee every six months and a final copy of your report at the end of the study.
- Any serious adverse events must be reported at once to this Committee.
- Please note that when your approval expires you may need to request for renewal. The request should be accompanied by a Progress Report (Progress Report Forms can be obtained from the Secretariat).
- **Ensure that a final copy of the results is submitted to this Committee.**

Yours sincerely,

  
Dr. J.C Munthali  
**CHAIRPERSON**

**Date of approval:** 16 March, 2012

**Date of expiry:** 15 March, 2013



## Annex 15: Approval from the Ministry of Health

All Correspondence should be addressed to the  
Permanent Secretary  
Telephone: +260 1 253040/5  
Fax: +260 1 253344



REPUBLIC OF ZAMBIA  
**MINISTRY OF HEALTH**

In reply please quote:

No.....

NDEKE HOUSE  
P. O. BOX 30205  
LUSAKA

MH/101/17/6

10<sup>th</sup> April, 2012

Mr Mike Mwanza  
National Food and Nutrition Commission  
P.O. Box 32669  
LUSAKA

Dear Mr Mwanza,

**Re: Request for Authority to Conduct Research**

The Ministry of Health is in receipt of your request for authority to conduct a study on **“Evaluation of the Outpatient Therapeutic Programme for Management of Severe Acute Malnutrition in Three Districts, Eastern Province”**. I wish to inform you that following submission of your research proposal to my Ministry, our review of the same and in view of the ethical clearance, my Ministry has granted you authority to carry out the study on condition that:

1. The relevant Provincial and District Directors of Health where the study is being conducted are fully appraised;
2. Progress updates are provided to MoH quarterly from the date of commencement of the study;
3. The final study report is cleared by the MoH before any publication or dissemination within or outside the country;
4. After clearance for publication or dissemination by the MoH, the final study report is shared with all the relevant Provincial and District Directors of Health where the study was being conducted, and all key respondents.

I consider your research topic to be of policy relevance.

Yours sincerely,

Dr. P. Mwaba  
Permanent Secretary  
**MINISTRY OF HEALTH**