ASSESSMENT OF PERFORMANCE OF SUPPLEMENTARY FEEDING PROGRAM FOR UNDER-FIVE CHILDREN IN THREE TEMPORARY SHELTERS IN TAK PROVINCE, THAILAND

Miss Nita Sedhain

A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Public Health Program in Public Health
College of Public Health Sciences
Chulalongkorn University
Academic Year 2010

การประเมินผลโครงการให้อาหารเสริมสำหรับเด็กขาดอาหารอายุต่ำกว่า ๕ ปี ในค่ายผู้ลี้ภัย ๓ แห่ง จังหวัดตาก ประเทศไทย

นางสาวนิต้า เซไทย

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาสาธารณสุขศาสตรมหาบัณฑิต

สาขาวิชาสาธารณสุขศาสตร์

วิทยาลัยวิทยาศาสตร์สาธารณสุขจุฬาลงกรณ์มหาวิทยาลัย

ปีการศึกษา 2553

Thesis Title ASSESSMENT OF PERFORMANCE OF SUPPLEMENTARY FEEDING PROGRAM FOR UNDER-FIVE CHILDREN IN THREE TEMPORARY SHELTERS IN TAK PROVINCE, THAILAND

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นิต้า เซไทย: การประเมินผลโครงการให้อาหารเสริมสำหรับเด็กขาดอาหารอายุต่ำกว่า ๕ ปี ในค่ายผู้ลี้ภัย ๓ แห่ง จังหวัดตาก ประเทศไทย (ASSESSMENT OF PERFORMANCE OF SUPPLEMENTARY FEEDING PROGRAM FOR UNDER-FIVE CHILDREN IN THREE TEMPORARY SHELTERS IN TAK PROVINCE, THAILAND) อาจารย์ที่ปรึกษาหลัก: อาจารย์ ดร. เขมิกา ยามะรัต, 77 หน้า

วัตถุประสงค์ของการศึกษา เพื่อประเมินการปฏิบัติงานโปรแกรมการให้อาหารเสริมสำหรับเด็กขาดสารอาหาร และประเมินความต้องการในการพัฒนาคุณภาพการให้บริการสำหรับเด็กอายุต่ำกว่าห้าปี ของค่ายผู้ลี้ภัยชั่วคราวจำนวนสามศูนย์ในจังหวัดตาก ประเทศไทย การศึกษาแบบภาคตัดขวางจากข้อมูลทุติยภูมิของเด็กจำนวน 1,079 คน ซึ่งมีอายุระหว่าง 5 – 59 เดือน ซึ่งเข้าร่วมโครงการการให้อาหารเสริมในค่ายผู้ลี้ภัยชั่วคราวจำนวนสามแห่ง ของจังหวัดตากประเทศไทย ระหว่างปี 2552-2553 และข้อมูลจากการสัมภาษณ์เชิงลึก ในกลุ่มมารดาหรือผู้ดูแล รวมทั้งเจ้าหน้าที่ในโครงการ โดยเจ้าหน้าที่สาธารณสุขเป็นผู้เก็บข้อมูล การวิเคราะห์ข้อมูล ใช้โปรแกรม SPSS สถิติ Pearson's chi-square และข้อมูลเชิงคุณภาพใช้การวิเคราะห์เนื้อหา ผลการวิจัยพบว่า 51.9 % เป็นเด็กเพศชาย และ 48.1 % เป็นเด็กเพศหญิง 57.18 % มีอายุระหว่าง 6-24 เดือน และ 42.82 % มีอายุระหว่าง 25-59 เดือน อัตราการรักษาในโครงการโดยภาพรวมเท่ากับ 39.2 % (SPHERE standard >75 %) เป็นการรักษาไม่สำเร็จเท่ากับ 15.8 % (SPHERE standard<15 %) ไม่มีการตายจากการขาดสารอาหาร อัตราที่ได้รับการรักษาสูงสุดอยู่ที่ศูนย์นูปอ 61.7 % และอัตราการได้รับการรักษาอยู่ต่ำที่สุดที่ศูนย์แม่ลา 18.1 % สัดส่วนสูงสุดของอัตราความไม่สำเร็จในศูนย์แม่ลาและศูนย์อุมเปี่ยมใหม่เท่ากับ 20 % และสัดส่วนต่ำสุดเท่ากับ 5.2% เด็กส่วนใหญ่ 65.4% อาศัยอยู่ในศูนย์อพยพมากกว่า 8 สัปดาห์ ในช่วงเวลาระหว่างระยะการให้อาหารเสริม การประเมินการปฏิบัติการโครงการให้อาหารเสริมทั้งสามค่ายผู้ลี้ภัย พบว่ามีผลลัพธ์อยู่ในระดับต่ำกว่าเกณฑ์มาตรฐาน ผลการวิจัยเสนอให้มีการอบรมเจ้าหน้าที่ด้านการจัดการดูแลเด็กขาดสารอาหาร การบันทึก การให้สุขศึกษาด้านโภชนาการ รวมทั้งการให้ความรู้ชุมชนด้านโภชนาศาสตร์เพิ่มขึ้น

สาขาวิชา: สาธารณสุขศาสตร์ ลายมือชื่อนิสิต.....

ปีการศึกษา: 2553 ลายมือชื่ออาจารย์ที่ปรึกษาวิทลัก……..

#5379104453 : MAJOR PUBLIC HEALTH
KEY WORDS : SUPPLEMENTARY FEEDING/ OUTCOMES INDICATORS

NITA SEDHAIN: ASSESSMENT OF PERFORMANCE OF SUPPLEMENTARY FEEDING PROGRAM FOR UNDER-FIVE CHILDREN IN THREE TEMPORARY SHELTERS IN TAK PROVINCE, THAILAND. ADVISOR: KHEMIKA YAMARAT, Ph.D.77pp

The aim of the study was to assess the performance of the Supplementary Feeding program being implemented by health agencies, as well as to identify areas that needed improvements to ensure better quality service delivery implemented in three temporary shelters among under-five children of Tak Province, Thailand. A mix method cross- sectional study including secondary data on 1,079 children aged between 6 and 59 months enrolled in supplementary feeding programs of three temporary shelters in Tak Province, Thailand, between 2009 and 2010 were analyzed and in-depth interviews were conducted with health care providers and mothers/caregivers from all three temporary shelters. Data analysis was done by using SPSS V. 16, chi-square test and content analysis. The results shows that out of 1,079 children included in this study, 51.9 % were male and 48.1 % were female. Similarly 57.18 % were among 6-24 months and 42.82 % were among 25-59 months age groups. The overall cure rate was 39.2 % (SPHERE standard >75 %), defaulter rate was 15.8 % (SPHERE standard<15 %). There were no deaths recorded due to malnutrition. The highest cure rate was found in Nu Poh (61.7 %) and lowest cure rate was in Mae La (18.1 %). Highest proportion of defaulter was in Mae La and Umpiem Mai (20 %) and Nu Poh (5.2 %) had lowest defaulter rate. The assessment of performance of supplementary feeding programs in three temporary shelters in Tak Province has shown all outcome indicators below the SPHERE standard. Training to health workers on case management, record keeping and nutrition education and community nutrition education was suggested.

Field of Study: …Public…Health…… **Student's Signature**……

Academic Year: ……2010…… **Advisor's Signature**……

ACKNOWLEDGEMENTS

It gives me immense pleasure and satisfaction to acknowledge the help and support of various people whose valuable contributions helped me in completion of this research work. I wish to express my gratitude and appreciation to all of the health workers of the three temporary shelters; Mae La, Nu Poh and Umpiem Mai of CCSDPT who generously agreed to share their valuable time, resources for my research study.

I extend my sincere thanks and heartfelt gratitude to my research supervisor Dr. Khemika Yamarat for her guidance, valuable suggestions, constructive feedback, and encouragement and for the knowledge and experiences which she has generously shared with me.

A special vow of thank to senior researcher who help me to conduct in-depth interview and provide me all the information and resources that are needed for the study. Mr. Ram Prasad Sedhain for his valuable statistical guidance and direction in research methodology throughout the work.

Finally, thanks to my mother Mrs. Bimala Sedhain and my father Mr. Ram Prasad Sedhain for providing me financial and necessary moral support required during my study. And also thanks to my senior Ph.D students Ms Khun Thanita for helping me and giving suggestion regarding qualitative research design also for her wonderful support while editing my in-depth guideline.

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LIST OF ABBREVIATIONS

AID	Aide Medical International
BEOC	Basic Emergency Obstetrics Care
χ^2	Chi-square
CCSDPT	Committee for Coordination of Services to Displaced persons in Thailand
CDC	Centers for Disease Control
CHW	Community Health Workers
FAO	Food and Agriculture Organizations
HA	Height- for- Age
HAZ	Height-for –Aged Z- score
HIS	Health Information System
HV	Home Visitors
INCAP	Institute of Nutrition of Central America and Panama
IPD	In- Patient Department
LBW	Low Birth Weight
MAM	Moderate Acute Malnutrition
MDGs	Millennium Development Goals
NCHS	National Centre for Health Statistics
NGO‟s	Non- Governmental Organizations
OPD	Out Patient Department
SFP	Supplementary Feeding Programs
SMRU	Shoklo Malaria Research Unit
TBBC	Thailand Burma Border Consortium
TFP	Therapeutic Feeding Program
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations International Children‟s Emergency Fund
WHO	World Health Organization

CHAPTER I

INTRODUCTION

1.1 Background & Rationale

A total of 79,433 Burmese refugees have been residing in three temporary shelters in Tak Province, Committee for Coordination of Services to Displaced persons in Thailand (CCSDPT, 2010). Total number of under-five children is estimated 10,330 (CCSDPT, 2010). Basic primary health care, shelter and food rations have been provided by various humanitarian agencies in close cooperation with Thai government. Due to various reasons these refugees are residing in close monitoring camps and movement outside camps is restricted. All refugees are relying on dry food rations provided by humanitarian agencies. Additional food supplementation has been provisioned for those who are considered high risk such as pregnant and lactating women, chronic medical cases, HIV/AIDS patients and moderately malnourished under five years children Program report of Thailand Burma Border Consortium (TBBC, 2009).

1.2 Malnutrition among under-five children

Malnutrition is the condition that results from taking an unbalanced diet in which certain nutrients are lacking, in excess (too high an intake), or in the wrong proportions. A number of different nutrition disorders may arise, depending on which nutrients are under or overabundant in the diet.

As described in World health organization (WHO) and Centre for Diseases Control and Prevention (CDC) standard reference growth charts, there are three indices of malnutrition, they are: **weight –for-age** (w/a), **weight –for-height** (w/h) and **height –for-age** (h/a).And these indices of malnutrition includes; underweight that means, growth chart expressed in (Z scores or % median) and similarly wasting and stunting expressed in Z scores. This paper uses the term weight- for- height means (w/h) reflects rapid weight loss or weight gain, and these w/h index used to measure current or wasting malnutrition. i.e.; low w/h = “wasting” („acute malnutrition“ or w/h equivalent to < -2 Z scores**) -** a child usually looks thin. If the

weights for height indices will be < - 3 Z score then the case is considered acute severe malnutrition.Wasting related to inadequate intake of food and can be moderate or severe also increased risk of illness and death. Generally cases of acute moderate malnutrition are being treatment with supplementary feeding programs (SFP) and cases of severe acute malnutrition are treated with therapeutic feeding programs (TFP) (TBBC, 2009) . According to WHO global database on child growth and malnutrition uses a Z-score cut-off point of <-2 standard deviation (SD) to classify low weight-for-age, low height-for-age and low weight-for-height as moderate under nutrition, and <-3 SD to define severe under nutrition. The cut-off point of >+2 SD classifies high weight-for-height as overweight in children (WHO, 1997).

1.3 Nutritional status of under-five children in temporary shelters

Nutrition status of under-five children in all temporary shelters has regularly been monitored by Thailand Burma Border Consortium (TBBC), which provides food and non food assistance to all refugees along Thailand-Myanmar border camps. Annual nutrition survey has been conducted for assessing nutritional status of under-five children. Recent nutrition survey conducted by TBBC has shown an average 3.2 percentage of acute malnutrition rate among under-five children in temporary shelters in Tak Province (TBBC, 2009). Health agencies have been using results of this survey for estimating number of acute malnutrition children in their respective camps. An estimated 330 children are suffering from acute malnutrition in three temporary shelters in Tak Province. This number may vary due to new arrivals and occurrence of diseases particularly diarrhea, measles and respiratory infections. Regular growth monitoring activities are being implemented in all temporary shelters as a part of nutrition screening to scale down number of malnourished children for further nutritional assessments. All health agencies use standard anthropometric measurement (weight for height Z score) for deciding nutritional status of under-five children.

1.4 Supplementary Feeding for moderately malnourished children in temporary shelter

TBBC uses following WHO definition for supplementary feeding in temporary shelters “Supplementary feeding” is defined as the distribution of food to supplement energy and other nutrients missing from the diet of those who have

special nutritional requirements" (WHO, 1997). TBBC has provided standard guidelines for screening and assessment of malnutrition. All children from age 6 months to 59 months with weight for height Z score <-2 to <-3 will be enrolled in the supplementary feeding programs (SFP). All malnourished children in supplementary feeding programs will receive take home dry rations and mothers/caregivers receive nutrition education from SFP program staff on a regular basis. Children are regularly monitored and records have been maintained by health agencies on a weekly basis. TBBC has provided standard technical guidelines on SFP and health agencies follow this guideline during program implementation. Mothers/caregivers bring children every week for the food supplementation (Asia Mix) and for nutritional assessments. Asia Mix includes: Asia Mix(fortified flour) and Asia Mix premix ingredients: sugar, vegetable oil and dry skim milk powder, Red bean, Peanuts paste, Eggs, Dried fish, Fresh vegetables and fruits (TBBC, 2009).

1.4.1 Criteria for enrollment:

Age: 6-59 months, Anthropometric: Weight for Height < -2 to <-3 Z score. Anthropometric measurement means set of noninvasive, quantitative techniques for determining an individual's body fat composition by measuring, recording, and analyzing specific dimensions of the body, such as height and weight

1.4.2 Criteria for Discharge:

If the child‟s Z score remains >-1.5 for two consecutive weeks (TBBC, 2006). Then the child will be discharged from supplementary feeding program.

1.4.3 Criteria for programmes and data to be included in the study

Following criteria will be applied while selecting supplementary feeding program and data for this study.

- SFPs implemented in Mae la, Nu Poh and Umpiem Mai refugee camps.
- Target group comprises children 6-59 months of age.

- The objective of the SFP includes the prevention/ treatment of malnutrition (using Weight for Height and/or micronutrient deficiencies as both eligibility criteria and measures of outcome).
- Cover only for targeted feeding.
- Implemented between 2009 and 2010

All the information will be collected from routine monitoring system of supplementary feeding program of three temporary shelters in Tak Province and computed results will be compared with reference values provided by SPHERE standards (The full title of the Sphere Standards is "**Humanitarian Charter and Minimum Standards in Disaster Response**" The **Humanitarian Charter** states that "Humanitarian agencies committed to this Charter and to the minimum standards will aim to achieve defined levels of service for people affected by calamity or armed conflict, and to promote the observance of fundamental humanitarian principles". The minimum standards cover the following areas: Water, Sanitation and Hygiene Promotion, Food Security, Nutrition and Food Aid, Shelter, Settlements and Non-Food Items and Health Services) (www.sphereproject.org) against which functioning of individual programs can be interpreted. It is an indication of what might be considered an "acceptable" or "alarming" performance under average conditions where supplementary feeding programs are functioning. And for the quantitative analysis data will be done to derived following indicators which are considered as a minimum standard by SPHERE manual of SFP programs that is showing below:

1.5 SPHERE reference values for assessing performance of SFP

Table 1.SPHERE reference values of SFP

Indicators	**Acceptable level**	**Alarming Level**
Recovery Rate	>75 %	<50 %
Death Rate	<3 %	>5 %
Defaulter rate	<15 %	>25 %
Coverage rate	>90 %	<40 %
Average length of stay	< 8 weeks	>12 weeks

(Source: SPHERE handbook, 2004)

1.6 Rationale for assessing performance of SFP

The common purpose of supplementary feeding is to prevent or eliminate malnutrition through reducing the nutrient gap between an individual‟s actual consumption and his/her requirement. Supplementary feeding is the continuum which encompasses a range of strategies for distributing food, or making it more accessible to certain population groups or sub-groups. The efficacy of supplementary feeding in breaking the inter-generational cycle, or more positively turning it into a virtuous cycle, has been investigated in numerous small-scale experimental trials over the last three decades and proved important means for treatment and prevention of acute malnutrition among under-five children (WHO, 1997). Supplementary feeding programs have been implemented and become core components of much of primary health care programs in emergency. The need of the time is that all supplementary feeding programs must be monitored to assess effectiveness and outcomes should be compared with SPHERE standards.

Malnutrition remains a major public health problem throughout the developing world and is an underlying factor in over 50% of the 10-11 million children under 5 years who die each year of preventable causes (Black, et.al 2003; Caulfield, et.al, 2002; Rice, et.al, 2000 and Pelletier, et.al, 2003). However, whilst the importance of under-nutrition (low weight for age) is commonly acknowledged, the importance of acute malnutrition is seldom, if ever mentioned. This is a serious omission; acute malnutrition is an extremely common condition, associated with high rates of mortality and morbidity and requiring specialised treatment and prevention interventions. Approximately 9% of sub-Saharan African and 15 % South Asian children suffer from moderate acute malnutrition (UNICEF, 2005). And approximately 2% of children living in developing countries suffer from severe acute malnutrition (UNICEF, 2001). This is equivalent to approximately 60 million children suffering from moderate and 13 million suffering from severe acute malnutrition at any one time. Although data are imprecise, it is known that the risk of mortality in acute malnutrition is directly related to severity, with moderate wasting associated

with a mortality of between 30-115/1000/year (Pelletier, 1994). And severe wasting associated with a mortality rate of between 73-187 / 1000 / year (Pelletier, 1994).

Supplementary feeding programs are considered effective interventions for treating acute moderate malnutrition among under-five children. SFPs are also considered cost effective if these programs met SPHERE standards. Regular monitoring and assessment of program will provide opportunity comparing outcomes of supplementary feeding programs with set standards. While reviewing available reports and documents relating to supplementary feeding programs in temporary shelters in Tak Province, no such assessment study was conducted for several years of program implementation.

In conclusion it is worth to assess performance of supplementary feeding programs and its outcomes in three temporary shelters taking accounts of age, sex and time of the children enrolled. For improving the Performance of supplementary feeding programs (SFP) in three temporary shelters, there is a need for programmatic assessment of supplementary feeding program which will allow outcomes to be compared with SPHERE standards and reveal the areas where there is a need for further improvements.

1.7 Research Questions

The following research questions are formulated for this study:

- Are the outcomes of SFP program meeting the SPHERE standards among under-five refugee children in three Temporary Shelters of Tak Province, Thailand?
- Are SFP outcomes different in male and female and among 6-24 months and 25-59 months children enrolled in SFP?

1.8 Research Objectives

Objectives

- To assess outcomes of SFPs implemented in Mae La, Nu Poh and Umpiem Mai.

- To identify difference in outcomes of SFP by age, sex and seasonal time as well.
- To assess contextual factors influencing outcomes of supplementary feeding programs.

1.9 Operational Definitions

Recovery: A beneficiary that reaches the programme defined discharge criteria.

Defaulter: A beneficiary that is lost to the programme before reaching discharge criteria, and whose actual status (dead, recovered, other) is not known. Typically, two weeks of absence are required before classifying the child as a defaulter, though this varied between programmes.

Death: A beneficiary lost-to-follow-up who is reported dead by verbal autopsy of the family or by home visitors or recorded as dead during treatment at health facilities in side temporary shelters.

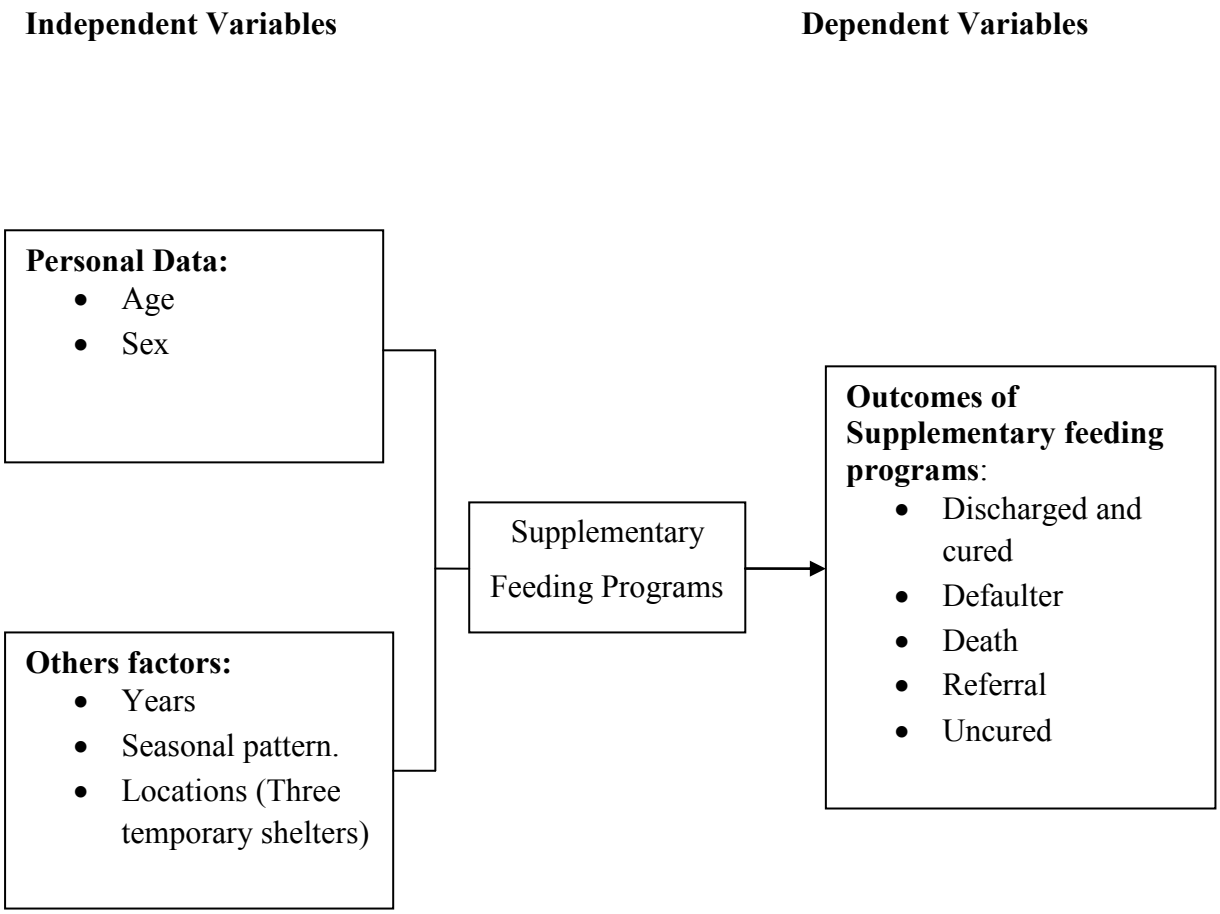
Non-cure: For the purposes of this study, this category includes:

- Patients transferred to a TFC due to deterioration in their nutritional status;
- Patients transferred to hospital due to a medical complication independent of their nutritional status;
- Patients did not meet discharge criteria for recovery after 8 weeks from admission.

Contextual factors: Characteristics of the physical and structural settings of the communities, the resources available within the program and social, environmental, demographic and cultural contexts related to the effectiveness and outcomes of supplementary feeding program in a refugee camp setting.

1.10 Conceptual framework

Figure1. Conceptual Framework for the assessment of SFP of under-five year‟s children



CHAPTER II
LITERATURE REVIEW

2.1 Who are refugees?

According to the United Nations High commissioner for Refugees (UNHCR), there is Over 20 million people‟s of „concern‟ around the world. This means that there are more people who are refugees, asylum seekers, returned refugees, internally displaced or stateless than the entire population. **(**UNHCR, 2003)

The United Nation 1951 Convention relating to the status of refugees define a "refugee" as a person who: "Owing to a well- found fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality and is unable or, owing to such fear, is unwilling to avail himself of the protection of that country"(UNHCR, 1996).

2.2 Burmese refugees along Thailand-Burma border

Thailand Burma Border Consortium (TBBC) is established in 1984 by a group of NGO‟s and church organization to provide assistance to people displaced by conflict in Burma. The Thailand Burma Border Consortium, a non-profit, non-governmental humanitarian relief and development agency, is an alliance of NGOs, working together with displaced people of Burma, to respond to humanitarian needs, strengthen self-reliance and promote appropriate and lasting solutions in pursuit of their dignity, justice and peace (TBBC, 2009).

TBBC works in cooperation with the Royal Thai Government and in accordance with regulation of the Ministry of Interior. It is an active member of the Committee for Coordination of Services to Displaced Persons in Thailand (CCSDPT), committed to coordination of all humanitarian service and protections activities with the other 17 NGO members of CCSDPT and the United Nations High Commission

for Refugee. TBBC‟s programs are implemented through partnerships with refugee committees, community-based organizations and local groups. Currently around 70 fulltime staffs are providing services to estimated 145,000 Burmese refugees living in nine temporary shelter camps on the Thai side of the border (TBBC, 2009).

Among the 145,000 total Burmese refugees, 79433 Burmese refugees are in the Tak province and 9,742 under-five children‟s are there in these three temporary shelter (Mae la, Umpiem Mai and Nu Poh camp) of the Tak Province (CCSDPT, 2010).

2.3 Description of refugee health and nutrition services along Thailand-Burma border

Health services are being provided to Burmese refugees by non-governmental organizations (NGO) including Aide Medical International (AMI), American Refugee Committee (ARC), Shoklo Malaria Research Unit (SMRU), and Thailand Burma Border Consortium (TBBC) in collaboration with Royal Thai Government. Basic essential health services including outpatient Department (OPD), In-patient Services (IPD), basic emergency obstetric care (BEOC), diseases control, vaccination and nutrition services are being made available to all camp residents and nearby Thai villagers. Referral services are available for emergency and most serious cases at district and provincial hospitals for all refugees. Basic laboratory services are also available in all camps. Promotive and preventive health activities are being implemented through community health workers in close participation with camp residents (CCSDPT, 2009).

2.4 Major health problems of refugees along Thailand-Burma border

Health problems of Burmese refugees are not different from the health problems of other population. Both communicable and non communicable diseases are prevalent inside refugee camps. Respiratory infections, Skin problems, diarrheal diseases, gastritis are major morbidities for both children and adult population. Moreover, significant number of cases of cancer, cardiovascular diseases and diabetes is also reported from refugee camps. While looking at burden of diseases, it seems

communicable diseases still account high proportion where as burden of death is accounted mainly due to non-communicable diseases in Burmese refugee camps (CCSDPT, 2009).

All camp residents are relied on dry food ration provided by TBBC which provides average 2000 kilocalories of energy per person day. Due to various reasons, these foods lack some very important elements which can easily be found from vegetables and meat which are not included in the daily ration of refugees. All refugees are confined to stay inside closely monitored camps and producing vegetable and rearing animals inside camps is not possible due to lack of land. Although TBBC has tried to balance all necessary ingredients to be included in daily ration, rate of acute malnutrition among under-five children remained static for many years. The rate of acute moderate malnutrition among under-five children is estimated at 3.2 percent and chronic malnutrition (stunting) at 36 % for many years. Efforts have been made to overcome problems of malnutrition through supplementary feeding and therapeutic feeding programs targeting most vulnerable groups including under -five children, pregnant and lactating mothers, chronic patients including tuberculosis and HIV/AIDS (TBBC, 2009).

2.5 Nutritional status of under-five children along Thailand-Burma border:

A study carried out at Mae la refugee camps in 2006 of refugee children aged 0 to 4.9 years revealed that 33.7% were underweight (w/a < –2 SD), 36.4% were stunted (h/a < –2 SD), and 8.7% were wasted (w/h < –2 SD) . In comparison, the prevalence of malnutrition among Thai children under five years of age, reported in 1996 and based on the National Centre for Health Statistic (NCHS)standard and –2 SD cut-off, was 18.6% underweight, 16.0% stunted, and 5.9% wasted. Based on WHO-endorsed criteria for identifying the severity of malnutrition among children in refugee populations, children were classified as malnourished if their weight-for-height scores fell below 70% to 80% of the NCHS reference population (Banjong et. al, 2006). Although rate of acute malnutrition among under-five children along

Thailand-Burma border camps is decreasing year by year, recent nutrition survey done by TBBC in 2009 showed 3.2 %.

2.6 Activities of supplementary feeding program

Nutrition program protocol for under-five children along Thailand-Burma border camps has mentioned following activities/criteria for SFP (TBBC, 2009).

2.6.1 Growth monitoring

Regular growth monitoring of under-five children (6 months-59 months) is being carried out in all temporary shelters and growth of children is being assessed using w/h anthropometric measurement. If the Z score is >1.5 no malnutrition and considered as healthy children and If the Z score is <-2 to <-3, considered as acute malnutrition and referred to SFP.

2.6.2 Enrolment in SFP

Re-assessment of nutritional status of children referred from under-five clinic, if anthropometric indices was found in between <-2 to 3, children will be enrolled in SFP.

Assessment of underline causes of malnutrition will be done and treatment of such conditions will be provided by health agencies. Care givers/mothers regularly receive nutrition education and advice on feeding practices, diseases prevention and follow up visits for SFP. All children receive dry take home ration for 1 week from SFP program from the date of admission. Community Health Workers (CHW) or Home visitors (HV) will regularly follow children enrolled into SFP.

Generally the care givers/mothers should bring their children on a weekly basis for follow up and ration. If the child"s anthropometric indices reaches >1.5 Z score for two consecutive weeks, then the child will be considered recovered and discharged from SFP.

Health agencies undertaking supplementary feeding programs have been using following criteria for admission and discharge of children in three temporary shelters.

2.7 Nutritional status among under- five year's children of different refugee camp

Study done in the camps in southern Darfur, food rations were routinely distributed to displaced families, but there were irregularities. Prevalence of acute malnutrition in Khartoum was around 20 % but declined to half that after the 3 months. In the camps, malnutrition reached more than 30% but declined to less than 10% and CMR for children under 5 years old reached 19 per 1000 but declined to 6 per 1000. Diarrhea, meningitis and ARI were responsible for deaths. To reduce the risk of measles, mass immunization campaigns were conducted (CDC, 1988-1989). Similarly study done by United Nations and the World Food Program 2006 in refugee camp of Tondouf Province of Algeria shows there are10% of the children below five years of age suffer from acute malnutrition. 32% are suffering from chronic malnutrition. A nutritional survey conducted in refugee camp Goma, August 1994 showed an acute malnutrition rate of 20.2% in all areas and acute severe malnutrition rate of 3.0% (MSF, 1994).

2.8 Worldwide nutrition situation

Worldwide malnutrition is an extremely serious issue particularly affecting the under five population. It is estimated that half the 12 million under five deaths that occur worldwide are associated with malnutrition (UNICEF, 2005). Malnutrition is a consequence of poverty and also leads to poverty. Even children with mild malnutrition are at between 2-8 times higher risk of mortality from common childhood illnesses than normally nourished children. The toll of malnutrition is that it causes death and long-term disability in whole population (Chen, et al., 1980).

According to United Nation "on average 62 million people die each year, of whom probably 36 million (58 per cent) directly or indirectly as a result of nutritional deficiencies, infections, epidemics or diseases which attack the body when its

resistance and immunity have been weakened by undernourishment and hunger (UN, 2001).

“Hunger and malnutrition are the underlying cause of more than half of all child deaths, killing nearly 6 million children each year – a figure that is roughly equivalent to the entire preschool population of Japan. Relatively few of these children die of starvation. The vast majority are killed by neonatal disorders and a handful of treatable infectious diseases, including diarrhea, pneumonia, malaria and measles. Most would not die if their bodies and immune systems had not been weakened by hunger and malnutrition moderately to severely underweight; the risk of death is five to eight times higher” (Food and Agriculture Organization, of the United Nation, 2005).

In South East Asia has the highest child malnutrition rate of world region. Study done in India showed there is contributes to about 5.6 million child deaths every year, more than half the world's total. The 2006 report mentioned that "the low status of women in South Asian countries has low knowledge regarding nutrition needed for the under-five year‟s children and which are important determinants of high prevalence of underweight children in the region" and was concerned that South Asia has "inadequate feeding and caring practices for young children (Pandey .G, 2006).

2.9 Consequences of malnutrition in under-five year’s children:

Malnutrition is a consequence of not enough quantity of the right nutritious food, ill-health and underlying factors such as environmental health (water/sanitation), poor health infrastructure and the caring practices within the home and community. It leads to both macro and micro nutrient deficiencies. Diet deficient in macronutrient such as protein, carbohydrates and fats or deficient in key micronutrients both lead to “wasting”, where the child is much thinner than for its height or age, and sometimes nutritional edema known as Kwashiorkor. Further consequences of malnutrition could lead to high level of anemia, low weight gain

during pregnancy, acute infections and chronic diseases. It also significantly affects cognitive development and learning achievements of children and this puts additional stress on health care expenditures (WFP-UNHCR, 2006).

Malnutrition has serious developmental implications. At the Millennium Summit of the United Nations in September 2000, all member nations joined in a formal commitment to reduce global deprivation, including poverty, hunger, poor health and abuses of human rights. That commitment was translated into a series of Millennium Development Goals (MDGs). According to the World Bank, "the MDGs cannot be reached without significant progress in eliminating malnutrition" (United Nation Systems-Standing Committee on Nutrition, 2004).

In protracted refugee situations where the population is often extremely dependant on the humanitarian assistance and food aid, the value of the food will greatly determine their nutritional status. It is essential that highly dependent refugee populations are given sufficient macro and micro nutrients to support growth and development. It is no longer appropriate to just discuss kilocalories, fat and protein; micronutrients must be included in sufficient quantities if the food basket is to fully support the refugee nutrition needs. While sufficient food in quality and quantities is essential, it is not the only factor in health and nutritional security. Infant feeding practices, access to sufficient health services, clean water, and access to fuel, clothing and cooking equipment are all implicated alongside inadequate food as causes of endemic malnutrition. The long-term consequences of an inadequate varied diet, poor caring practices and poor infrastructure often leads to intergenerational malnutrition. A newborn baby girl with a low-birth weight, if she survives is likely to remain underweight, may have stunting (chronic malnutrition), become pregnant in early adolescent life and produce an underweight baby. Therefore it is extremely important to tackle malnutrition in particular in the under-five population and women, and in particular pregnant and lactating women.

2.10 Supplementary Feeding programs

Supplementary feeding is most cost-effective when integrated with other nutrition-relevant actions that cover the non-food causes of malnutrition, along with the opportunities for forming productive partnerships with other actors. The paramount importance of monitoring and evaluation for keeping track of the performance of project against its objectives is considered very important in all supplementary feeding programs.

Malnutrition that occurs during childhood, adolescence and pregnancy has an additive negative impact on the birth weight of the newborn. A low birth weight (LBW) baby who has suffered intra-uterine growth retardation as a foetus is effectively born malnourished, and is at higher risk of dying in the neonatal period or later infancy. If s/he survives, s/he is unlikely to significantly catch up this lost growth later and will be more likely to experience a variety of developmental deficits. By age five, s/he is most likely to be stunted; a condition which will probably persist through adolescence and adulthood. The adolescent growth spurt offers a chance to compensate for earlier growth failure although such potential is limited. The stunted child is likely to become a stunted adolescent, and later a stunted adult. Stunted pregnant women are more likely to give birth to low birth weight babies. And so the cycle turns. A child has food, health and care needs which must all be fulfilled if s/he is to grow well. Most active growth faltering occurs between the ages of 6–24 months, when the child is no longer being protected by exclusive breastfeeding. (In fact, the most critical period is 6–18 months). At this time, the child is becoming more exposed to disease and infection through food or water contamination and is dependent on the mother or caregiver for frequent complementary feeding throughout the day. Growth failure is most preventable and most reversible at this age. From about two years of age, the child is more likely to grow normally for a child of that age, although s/he is unlikely to recover the growth “lost” in the first two years.

2.11 Efficacy of SFP

Regarding efficacy, many studies have shown that raising dietary intake through supplementary feeding can have beneficial nutritional consequences, including effects on outcomes such as growth, activity, cognitive development and compensation of energy lost during illness. The most thorough of these studies was carried out in Guatemala. From 1969 to 1977, the Institute of Nutrition of Central America and Panama (INCAP) carried out a longitudinal study in four Guatemalan villages to investigate the effects of child supplementation. Important effects on growth, physical and mental development were noted in early childhood. The benefits were greater in children with lower socio-economic or nutritional status and higher prevalence of morbidity. Weight gain was most pronounced during the first two years of life, and height gain in the first three years. Gains between 3–7 years were not significant (Schroeder, et al., 1995).

The long-term effects were later investigated in the Guatemalan Orient Study 1969–1989 which followed-up the children originally supplemented to assess effects in adolescence. Results showed that after 15 years with no additional intervention, the group that received the supplement as young children maintained most of the original gains in height and weight, showed increased physical capacity and had better performance on various cognitive and behavioural tests. And the association was three times stronger among girls than boys (Pollit, et al., 1993).

There are important interactions between dietary intake and health status, with implications for supplementary feeding programs. The so-called “malnutrition-infection complex” has been well documented (Tomkins and Watson 1989). Basically, both ill-health and poor dietary intake can result in malnutrition, but there is an important synergistic interaction whereby the combined effect is usually worse than the sum of the two individual effects. This means that, while it is important to deal with both health and dietary factors, in order to address malnutrition, dealing with one alone (e.g. dietary intake) can effectively remove the interaction effect. Dietary interventions during and immediately after an infectious disease episode can thus affect the course and effects of the disease, and reduce the extent to which

nutritional status deteriorates. Nutrition is thus relevant to disease management. Supplementation has been found in studies in Colombia and Guatemala (Lutter, et al., 1989). To modify the negative effect of diarrhoea on growth, the more severe the diarrhoea, the greater the protective effect of feeding. Feeding sick children thus mitigates the adverse effect of interactions within the Malnutrition-infection complex, although this is made more difficult by the anorexia that commonly accompanies infectious disease, and possibly also the raised nutrient requirements e.g. fever. As well as dietary management, adequate dietary intake is thus preventive in that it bolsters immunity. Indeed, it has been claimed that longer-term trends (over decades) towards improved health in many countries are basically due to the preventive effect of better nutrition. As might be expected from such morbidity effects, other studies have directly shown the positive impact of supplementary feeding programs on mortality rates. Finally, the increased attendance which has been shown at clinics where supplementary feeding is undertaken is another example of a mutually reinforcing benefit due to preventive health.

Supplementary Feeding Programmes (SFPs) have been a standard strategy to address moderate malnutrition in emergencies since the seventies. During this period, the basic set up of programmes has remained virtually unchanged, apart from some modifications to recommendations on distributed foodstuffs and standardized medical treatment. In contrast, other strategies like Therapeutic Feeding Programmes have undergone dramatic changes, i.e. the introduction of Therapeutic Foods and specific medical protocols and, more recently, the development of Community Based strategies.

2.12 Implementation assessment of SFP

The implementation of SFPs in practically all emergency situations where high rates of acute malnutrition are detected, and the lack of evolution of their protocols is at odds with the substantial controversy over the efficacy and appropriateness of SFPs in emergency contexts. Over the years, critics of emergency SFPs have raised questions about their appropriateness in the absence of adequate general rations (a frequent occurrence during emergencies) and the relative cost-

inefficiency of setting a separate infrastructure from the general ration programme in order to allocate small quantities of food to vulnerable groups. In spite of such controversy, there has been no credible overall assessment of the impact or effectiveness of these programmes. Implementing agencies and donors for these types of intervention have conducted evaluations on a small percentage of programmes but methodologies have been variable making comparison difficult.

A recent review of published evidence for impact of SFPs in emergencies between 1980 and 2004 involving five data bases revealed that only a minute percentage of programmes have been rigorously evaluated in terms of impact with findings published. The review found that not only was the quality of these studies generally poor but that the findings were largely equivocal with regard to programme outcomes. While the majority of emergency SFPs conduct routine monitoring of key programme outcomes as indicated in the Sphere Minimum there has been no attempt to conduct a comprehensive collation and analysis of the findings of these project data. This lack of comprehensive over-view and critical analysis of this form of programming is surprising and potentially worrying. At the beginning of the 1980s, a large-scale multi-country review of the impact of supplementary feeding programmes in non-emergency situations was conducted by (Beaton and Ghassemi, 1982). The reviewers concluded that there was little impact of these programmes in terms of growth performance. Arguably, these findings had a significant impact on the perception of these programmes that in turn contributed to a reduction in the subsequent scale of their implementation. A similar review of emergency supplementary feeding programmes is long overdue, as it cannot be assumed that these types of emergency programme automatically achieve their objectives or that if they do, they do so in a cost-effective manner.

SFP programmes monitor effectiveness through the collection, analysis and presentation of quantitative process indicators on four areas of programme activities:

- Number of admissions disaggregated by age and sex.

- Number of exits disaggregated by outcome.
- Total number of people in the programs.

It is important to keep data collection as simple as possible in order to allow busy primary health care staff to implement the system. Taking accounts of, the above data represent the minimum information needed for effective programme monitoring. However, in some circumstances, particularly humanitarian operations, it may be necessary to collect additional information on the place of origin, displaced/resident status, whether household is receiving general food distribution etc. according to reporting needs and the context of the programme. This routine data is collected on a weekly basis and aggregated together in simple tally-sheets that are compiled into weekly and monthly reports. During compilation, data is reorganised so that new SFP admissions can be separated out to avoid double counting. Humanitarian programmes tend to compile the tally-sheets in a computerised database and this has been extremely useful in the collection of the current evidence base on SFP. However, in developmental settings manual compilations and basic graphs are as functional and more appropriate.

In conclusion all SFPs need to be assessed on a periodic basis in order to document performance outcomes and possible reasons for successes and failures. Outcome assessment disaggregated by sex and age would provide comprehensive ideas in developing strategies for improving SFPs. For improving the Performance of supplementary feeding programs (SFP) in three temporary shelters, there is a need for programmatic assessment of program which will allow outcomes to be compared with SPEHERE standards and reveal the areas where there is need for further improvements.

CHAPTER III
RESEARCH METHODOLOGY

3.1 Introduction

The study was led by the scholar with the support of locally trained assistants for collecting data by a set of tools. For the purpose of the study, an SFP will be defined as: one or more Supplementary Feeding Centres or Units – fixed or mobile – established in a defined regional area, addressed to a specific population group and managed by the same structures – even if this involved several actors working in coordination.

Implementing agencies was been asked to identify the SFPs that fitted the predefined criteria, and to select and send in reports to the study. The reports received included needs assessments, nutrition protocols, internal reports, nutrition surveys and internal monthly reports from feeding centres. During the process of data extraction, each programme was summarised using these forms. The variables was then coded and entered into the final database. All data extraction was conducted by the researcher. The summary form was provided a comprehensive picture of the programme. These forms included a description of the main characteristics of the programme, problems encountered and the agency‟s own assessment of performance. A substantial effort was made to recover all variables of interest for the study.

Assessing the performance of Supplementary Feeding Programmes in three temporary shelters in Tak Province, all statistical information will be checked and validated, specifically with regard to the following points:

• Age groups covered by the data;
• Numerator used for the calculation of percentages of exits;
• Minimum level of aggregation in terms of time (monthly, quarterly) and location.
• Whether information presented as percentages was available as raw data (to allow recalculation of rates); and gaps in information for a specific month or location.

3.2 Research design

In this research, the cross-sectional study design was applied using quantitative and qualitative research methods. Quantitative research method was been adopted for achieving the first two objectives: to assess outcomes of SFPs implemented in Mae La, Nu Poh and Umpiem Mai and to identify difference in outcomes of SFP by age, sex and seasonal time. The final objective, which is to assess contextual factors influencing outcomes of supplementary feeding programs, was been accomplished by using qualitative research method.

3.3 Study area

The research was conducted in three refugee camps at Tak Province, Thailand. The refugee camps are Mae La, Nu Poh and Umpeim Mai where the Supplementary Feeding Program (SFP) has been implemented for all moderately malnourished under-five children.

(Source: www.tbbc.org)

Figure 2: Map of the Three Camps

3.3.1 Mae La refugee camp

Mae La refugee camp is the biggest camp among these three shelters, and lies north of Mae Sot on the western border of Thailand was established in 1984. It is located at Tha Song Yang District of Tak Province total area covered by 1,148 rai**.** The community of Mae La is built up by multi-racial and multi-cultural and with different age groups. The total population is 43,725(CCSDPT, 2010). Prevalence of Global Acute Malnutrition in Mae La under five year"s children is 3.2% (TBBC, 2009).

3.3.2 Umpiem Mai refugee camp

Umpeim Mai refugee camp is located at Prob Pra district of Tak province and total area covered by 493 rai. The camp is situated on a very hilly terrain where the altitude is approximately 1200 meters. Total population of this camp is 17,792 (CCSDPT, 2010). Prevalence of Global Acute Malnutrition (GAM) in this camp under five year"s children is 2.1% (TBBC, 2009).

3.3.3 Nu Poh refugee camp

Nu Poh refugee camp, this camp was set up in March 1997. Located at Tampon Mae Jan, Umphang district and the total area covered by this camp is 400 rai. The total population of this camp is 17, 783 (CCSDPT, 2010). Prevalence of Global Acute malnutrition in this camp for under five year"s children is 1.9% (TBBC, 2009).

3.4 Study Population

Malnourished under-five children enrolled into SFPs was considered as the study population for investigating SFP service data by quantitative method. Regarding to all three refugee camps, there are 9,742 under-five years children (cases) in total. For quantitative methods, there were 554 and 793 children have been enrolled into SFP in Mae La temporary shelter 2009 and 2010 respectively. Total number of malnourished children enrolled into SFP from Umpiem Mai camp was 195 and 158 during 2009 and 2010 respectively. Similarly 142 and 247 children have been enrolled into SFP in Nu Poh camps during 2009 and 2010 respectively (i.e., 414 from Mae La, 339 from Umpiem-Mai and 326 from Nu-Poh in 2009/10).

All children who met inclusion criteria have been included in the study but re-admission due to non-cure where not included into studies due possible double counts which may affect results. This study intended assess the performance of SFP program so all reported cases were included in this study. Random selection of subjects was not possible due to different outcomes which could affect result. And for qualitative method, the study population was mothers/care takers of under- five year‟s children enrolled into SFPs as well as health service providers involved in SFPs. In each camp, health service providers who involve in SFP are 5 nurses, 3 medics and 2 CHW.

3.5 Sample Size

Quantitative research method

Sample size for malnourished under-five children enrolled into SFPs was calculated by using Taro Yamane‟s formula. The calculation presented below indicates that sample size should be at least 384 children. However, this study was investigate SFP service data of all malnourished under-five children enrolled into the programs instead of using the sample.

$$n = \frac{\mathbf{N}}{\mathbf{1 + N(e)^2}}$$ **(According to Taro Yamane's)**

Where, N = Population (under five year population)

e = Desired Precision (i.e. 0.05)

$$n = \frac{9742}{1 + 9742\,(0.0025)}$$ **= 384.22**

Inclusion criteria for quantitative method:

Moderately malnourished children, age between six to fifty nine months, and enrolling into SFPs as a first visit during 2009/10.

Qualitative research method: Mothers/care takers of malnourished under-five children enrolled into SFPs

In each refugee camp, 4-6 mothers/care takers of malnourished under-five children enrolled into SFP was selected as key informants for interviews by purposeful sampling technique. Inclusion criteria are being the main care takers of malnourished children enrolled into SFPs during 2009/10, living in three temporary shelters, and voluntary participation. This group of key informants was consisting of 2-3 improved cases and 2-3 failed cases after the first visit. For three temporary shelters, there were 12-18 cases in total. A set of semi structured questionnaire was used for interviewing mothers and care-givers and emphasis was given to explore more information regarding feeding practices, food preparation, and child rearing and follow up activities of SFP in temporary shelters

Health service providers

In-depth interview was taken from the health workers i.e. nurses, community health workers (CHW) and medics involved in providing SFP services was interviewed from all three temporary shelters using in-depth interview guideline. There are 5 nurses, 3 medics and 2 CHW were involved in each camp for the SFP. The selection criteria for health workers would be by using purposive sampling the health workers who are mostly involved in this program from last three month were selected for the interview by his/her consent. So one nurse, one CHW and one medics was taken from each camp for the in-depth interview.

3.6 Data Collection

3.6.1 Review of relevant documents

The procedure of data collection for the quantitative data is relating to SFP of three temporary shelters of Tak province was collected from respective health agencies, through their monthly reports. Written consent had been received from Committee for Coordination of Services to Displaced persons in Thailand (CCSDPT/HIS) program who manages all data relating to refugee health program along Thailand-Burma border camps. Researcher was extracting all necessary data from HIS database (public domain). All these data was further entered into Excel form for all three camps for further analysis.

Documents relating to SFP including protocols, reference charts and tools being used for assessing nutritional status was collected and reviewed while assessing performance of SFP in three temporary shelters. All relevant documents were collected from health agencies involved in implementing SFP in temporary shelters. Documents were accessed using web sites or contacting health agencies in person.

3.6.2 Collection, compilation and analysis of SFP service data

SFP data was collected from registers from all three temporary shelters and entered into Excel format. Information relating to age, sex, and nutritional status, seasonal time and date of admission and discharge of children enrolled into feeding program was been collected for all eligible children.

3.6.3 Collection of qualitative data through key informant interview

Qualitative data collection was conducted through interviews of both service providers and clients in order to examine contextual factors influencing outcomes of the SFPs. Mothers/care takers of under- five year‟s children enrolled into SFPs as well as health service providers of refugee camps who involve in SFPs will be purposively selected and approached as key informants of interview. By hearing from both sites, it is possible to investigate what people involved in the SFP service think and feel according to their experiences. Data from interviews can illustrate factors related to outcomes of SFPs in terms of quality of care, adequacy of available facility,

accessibility, and satisfaction of service, as well as difficulties and obstacles in delivering and receiving the service.

Since the researcher is not allowed to enter inside these refugee camps, all interviews was been done by a senior health professional that is qualified to do interviews in this study. While recruiting these research assistants, both local and english language skills was been considered. The researcher was provided necessary training/orientation to all research assistants prior to data collections. The qualification of the interviewer includes being well-trained, having experiences and skills in qualitative data collection.

English version questions was been translated into local language by a professional and this was been reviewed by another professional before finalization. And the researchers were ensure to recruit assistants who can read and understand English and Burmese language. Qualitative data collection tools, including interview guidelines, tape recorder, camera, and notebook, was been utilized.

3.7 Data Analysis

Quantitative data analysis

After reviewing the data for completeness inclusion and exclusion criteria, the data was encoded and processed for statistical analysis using SPSS version 16. Data analysis was been done as follows:

- Descriptive statistics of frequency, percentage, mean, standard deviation, and 95 % CI will be calculated to analyze data regarding age group of the children, gender to assessment of SFP.
- Chi- square test was applied to identify the categorical variables like, comparison between gender and outcome of the SFP programs.

Qualitative data analysis

Qualitative data from interviews was analyzed through content analysis process.

3.8 Ethical Consideration

Necessary steps were followed for meeting ethical criteria for this study. Permission was sought from relevant authorities for collecting and using service data from three temporary shelters prior to this study. This study was reviewed and approved by The Ethics Review Committee for Research Involving Human Research Subjects, Health Science Group, Chulalongkorn University. Informed consent was been sought from all participants for key informant interview by the researcher and her assistants. Individuals‟ privacy and confidentiality were strictly protected. Rights of informants were concerned in order that they should feel free and comfortable to participate in the study. All key informants could determine when, how, and to what degree of information to share or to withhold any information from the research.

3.9 Limitation

This study was done only in three refugee camps setting in Tak Province, Thailand. Since the study aimed to collect SFP related data during 2009-2010.The findings of this study was been valid only for the respective camps due to variation in settings and implementing agencies but it was useful to look at outcomes of the program. Due to the researcher is not allowed to go inside the camp assistant researcher was been used to conduct the in-depth interview and also their might be a language barrier because the people of camps are the Burmese refugee. And the secondary data regarding coverage rate was got very late almost at end of the analysis. So there is limitation researcher wasn‟t able to collect further detail information in in-depth interview with the health workers.

3.10 Expected Benefits & Application

Performance of supplementary feeding programs of three temporary shelters was been assessed and recommendations was made for further improvements of SFP particularly in three temporary shelters in Tak Province, Thailand.

CHAPTER IV
RESULTS

4.1 Introduction

Child malnutrition is a major global public health problem. In developing countries, it is estimated that 19 million children are severely wasted and malnutrition is responsible for 11% of the total global disease burden (Habicht JP, 1994). Challenges in managing acute malnutrition in children under-five years have been widely reported over the past years. Non-governmental organizations (NGOs) have undertaken different interventions in response.

The Child Supplementary Feeding Program was implemented by border health agencies in temporary shelters of Tak province from 2002 through support from Thailand Burma Border Consortium (TBBC). The child Supplementary Feeding program is being implemented for several years and there was no assessments carried out to look at how these programs are performing in relation to set standard of program outcomes. The study was carried out in three temporary shelters namely Mae La, Umpiem Mai and Nu Poh in Tak Province in Thailand. The aim of the study was to assess the performance of the Supplementary Feeding program being implemented by health agencies, as well as to identify areas that needed improvements to ensure better quality service delivery. The assessment used in-depth interviews with caregivers, health workers and analysis of data available from supplementary feeding centers. TBBC implemented the Child Supplementary Feeding program in collaboration with two Non-Governmental Organizations, Aide Medicale International (AMI) and American Refugee committee (ARC) in Mae La, Umpiem Mai and Nu Poh temporary shelters. The aim of the Supplementary Feeding Program was to reduce malnutrition among children under the age of five years through target feeding. The three shelters were selected for study purpose due to similarity being in the same province and access to information.

The key activities carried out by health agencies in these three temporary shelters are growth monitoring of under-five age children to screen moderately malnourished children, assessment of children to enroll into SFP using weight for height anthropometric measurement, treatment of underline illnesses, nutrition education to mothers/caregivers and food supplementation. During the implementation period health workers children were monitored for weight gain and records were maintained in the registers. The child Supplementary Feeding Program was intended to specifically target only the moderately malnourished children under the age of five years in the three shelters. This was done in order to encourage communities to use their coping mechanisms for feeding children, thus avoid creating dependency. All three temporary shelters have been provided standard guidelines for Supplementary Feeding Program and health workers were trained aiming at strengthening the capacity of these stakeholders on targeting of beneficiaries, record keeping, maintenance of stock cards, preparation of the Supplementary food and community mobilization.

Children under the age of five years were brought for screening and subsequent registration into the SFP program for those with moderate malnutrition. All children whose weight for height fell between the <-2 to <-3 Z score were considered malnourished, and thus eligible for feeding.

After screening, a total of 565 children under the age of five years in Mae la, Nu Poh and Umpiem Mai were registered in the program in 2009. The number of children registered in SFP in three temporary shelters in 2010 was 514.

The table below shows the coverage of the supplementary feeding program in the three temporary shelters. The coverage of supplementary feeding program was calculated as follows;

$$\text{Coverage of SFP} = \frac{\text{Number of new admission in SFP}}{\text{Estimated number of children based on prevalence of Acute Global malnutrition (AGM)}} \times 100$$

CCSDPT/HIS report showed a total of 500 estimated malnourished children in three temporary shelters and out of them there were 369 new admissions during 2010. While looking at the current prevalence of acute global malnutrition rate (3.2 %, TBBC, nutrition survey 2010) number of malnourished children could be less than this but this estimation was based on 2009 nutrition survey results which showed rate of acute malnutrition in Mae La temporary shelter 6 %. Because of this number of estimated malnourished children was higher. This report showed 74 % coverage of supplementary feeding program among under-five children in three temporary shelters. While looking at individual shelters, Nu Poh temporary shelter had the highest coverage at 93%, followed by 73% and 57% in Mae la and Umpiem Mai respectively. This is also evident that higher coverage of supplementary feeding programs have resulted in better performance of supplementary feeding program, particularly in Nu Poh temporary shelter, where higher cure rate and lower defaulter rate was observed.

Table 2. Coverage for SFP in three temporary shelters in Tak province 2010

Temporary shelters	Estimated number of malnourished children	Number of new admission	Coverage of SFP Percentage
Mae la	222	161	73
Nu Poh	138	128	93
Umpiem Mai	140	81	58
Total	500	369	74

Source: CCSDPT/Health information system, report 2010, Bangkok, Thailand

The Objectives of the Assessment

To carry out the process and outcome assessment for Child Supplementary Feeding Program implemented in three temporary shelters in Tak Province, Thailand.

Study Methodology

The assessment study used information collected from interviews with Health workers and care givers at feeding centers and use of service secondary data relating to SFP from regular program monitoring registers. The sample framework is shown in table 3 below.

Table 3: SFP Assessment Sample for three temporary shelters in Tak province

Temporary shelters	Health workers interviewed	Mothers/care givers interviewed	SFP records of children collected
Mae La	5	7	414
Nu Poh	3	5	326
Umpiem Mai	3	5	339
Total	11	17	1,079

Health workers involved in screening of children, registration, education and follow up of SFP program were interviewed by a trained local research assistant employed by the Researcher. A detailed in-depth interview questionnaire was developed by the researcher and research assistant was trained on how to do interview using questionnaire and recording of responses. Similar questionnaire was developed for mothers and care givers and interview was done by research assistant in all three temporary shelters.

Copy of all registers used to record SFP were obtained from three temporary shelters from where all required data were extracted and entered into Excel worksheet by the researcher. After completing data entry, all data were fed into SPSS for analysis the outcomes of Supplementary Feeding program for the assessment by researcher.

4.2. Results of the Assessment of supplementary feeding programs of three temporary shelters in Tak province

A total of 1,079 children were included in this study from three temporary shelters in Tak province. Out of 1,079 children included in this study, 565 were enrolled in 2009 and 514 were in 2010. While looking at gender ratio 51.9 % were male and 48.1% were female. 57.18 % were among 6-24 months and 42.82 % were among 25-59 months age groups. Details of demographic characteristics of study population i.e., first visit of under-five years children enrolled in SFP are summarized in the following table.

Table 4: Demographic characteristics of study population in three temporary shelters in Tak province

Variables	**Temporary shelters**						**Total**	
	Mae La		**Nu Poh**		**Umpiem Mai**			
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Male	221	53.3	154	47.2	186	54.8	561	52
Female	193	46.7	172	52.8	153	45.2	518	48
6-24 months	281	67.8	168	48.4	168	49.5	617	57.1
25-59 months	133	32.2	158	51.6	171	50.5	462	42.9

Data analysis has shown more male (52 %) were enrolled into supplementary feeding program compared to female (48 %) in three temporary shelters in Tak Province. While looking at shelters specific Nu Poh has higher number of female enrolled into SFP than male. Similarly looking at age distribution of children enrolled into supplementary feeding program, 57 percent were under 2 years of age.

Mae La temporary shelter (67.8 %) recorded highest number of children under the age of two. Nu Poh and Umpiem Mai shelters have similar number of children between under 2 and over two years of age. Data analysis had shown more children of under age of two years were enrolled into supplementary feeding programs in three temporary shelters in Tak province.

Table 5. Relationship between personal data factors related to the outcomes of the SFP in overall camps

Personal Data	Outcomes			Total	χ^2	P-value
	Discharged and cured	Defaulter	Uncured			
Sex						
Male	225 (43.6)	81 (15.7)	210 (40.7)	516 (100.0)	0.011	0.00
Female	198 (35.2)	89 (15.8)	276 (49.0)	563 (100.0)		
Age						
6-24 months	228 (37.0)	100 (16.2)	289(46.8)	617 (100.0)	0.214	0.00
25-59 months	195 (42.2)	70 (15.2)	197(42.6)	462 (100.0)		

There was a high association between sex distribution and outcomes among under-five years children in three temporary shelters ($p<0.01$). An outcome shows that female had the higher rate of uncured rate (49.0%) than male (40.7%) and there was also higher rate of discharged rate among male (43.6%) than female. There was also high association between the age distribution and outcomes among the under-five year‟s children ($p<0.01$). Age of 6-24 months children had higher rate of uncured (46.8%) than children age of 25-59 months, similarly there was higher rate of defaulter among age of 6-24 months of age than 25-59 months of children. While seeing the discharged and cured rate there was higher chance among the25-59 months of age than – 24 months, as shown in Table 5.

Table 6: SFP data with time variables from three temporary shelters

Variables	Temporary shelters			Total	χ^2	P-value
	Mae-La	Nu-Poh	Umpiem-Mai			
Years						
2009	172 (30.4)	166 (29.4)	227 (40.2)	565 (100.0)	48.65	0.00
2010	241 (47.1)	160 (31.1)	112 (21.8)	514 (100.0)		
Seasons						
Dry cool seasons	43 (16.9)	93 (36.5)	119 (46.7)	255 (100.0)	1.060	0.00
Dry hot seasons	132 (34.6)	139 (36.5)	110 (28.9)	381 (100.0)		
Rainy seasons	239 (54.0)	94 (21.1)	110 (24.8)	443 (100.0)		

There was a higher case of malnutrition in 2009 among Nu-Poh and Umpiem-Mai. But there was higher case of malnutrition in 2010 at Mae-La (47.1%) than 2009 (30.4%). Data has been analyzed to look at any seasonal variations in admission of malnourished children into supplementary feeding program into three temporary shelters. Data analysis had shown highest number of children enrolled into SFP during rainy seasons, followed by dry hot and dry cool seasons. Only Umpiem Mai camp had more children enrolled into SFP during dry cool season. The susceptibility and severity of getting malnutrition with seasonal pattern is statistical significant at the 0.05 level (P=0.00). This means there is higher chance of malnutrition case of under- five years children in rainy seasons (54.0%) cases was seen in Mae-La and (24.8%) cases in Umpiem- Mai than compare to other seasons, as described in Table 6.

Table 7: Length of stay of children enrolled into SFP in three temporary shelters in Tak Province

Variables	Temporary shelters			Total	χ^2	P-value
	Mae-La	Nu-Poh	Umpiem-Mai			
Length of stay						
1-8 weeks	84 (20.3)	144 (43.8)	146 (43.0)	374 (100.0)	60.227	0.00
9-12 weeks	329 (79.7)	183 (56.0)	193 (57.0)	705 (100.0)		
Total	326(100.0)	339 (100.0)	413 (100.0)			

SFP data was analyzed to look at length of stay of children enrolled into feeding programs to enable comparison with set SPHERE standard. Out of 1079 children enrolled into SFP programs in three temporary shelters, 374 were discharges within 1-8 weeks and remaining 705 children were discharged between 9-12 weeks after admission. Only 34.6 percent children met the SPHERE standard in regard to length of stay. Majority of children (6 5.4 %) had more than 8 weeks of stay during their feeding period in three temporary shelters. Mae la temporary shelter had the lowest number of children having less than 8 weeks of stay in supplementary feeding. Umpiem Mai (43 %) and Nu Poh (43.8 %) shelters have relatively high proportion of children having less than 8 weeks of stay. There was high association between length of stay and Three temporary shelters ($p<0.01$), as shown in Table 7.

Table 8: Outcomes of supplementary feeding programs in three temporary shelters in Tak province

Variables	Outcomes			Total	χ^2	P-value
	Discharged and cured	Defaulter	Uncured			
Temporary shelters						
Mae- La	75 (18.1)	84 (20.3)	255 (61.6)	414 (100.0)	1.64	0.00
NU-Poh	201 (61.7)	17 (5.2)	108 (33.1)	326 (100.0)		
Umpiem- Mai	147 (43.4)	69 (20.4)	123 (36.3)	339 (100.0)		

There was a high association between outcomes and three temporary shelters ($p<0.01$).Nu Poh temporary shelter showed highest cure rate (61.7%) where as Mae la temporary shelter has lowest cure rate (18.1 %) among children enrolled into supplementary feeding programs. Similarly Nu Poh temporary shelter has lowest defaulter rate (5.2 %) compared to other two temporary shelters in Tak province. Defaulter rate in Mae La and Umpiem Mai camps (>20%) were found unexpectedly high compared to SPHERE standard.

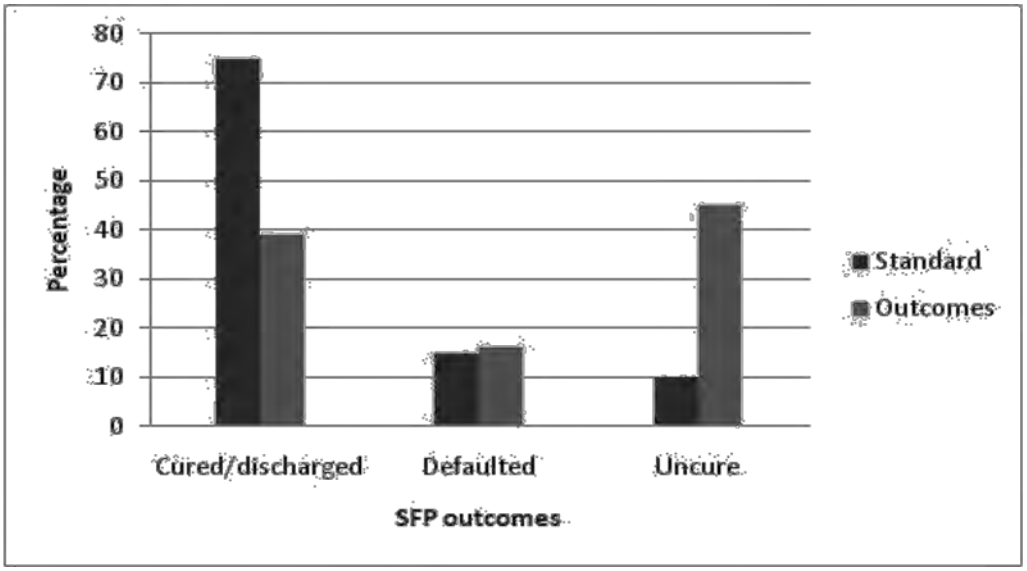
Table 9: Relationship between outcomes of SFP with seasonal times and length of stay

Variables	Outcomes			Total	χ^2	P-value
	Discharged and cured	Defaulter	Uncured			
Length of stay						
1-8 weeks	247 (66.2)	125 (33.5)	1 (0.3)	373 (100.0)	4.739	0.00
9- 12 weeks	176 (24.9)	45 (6.4)	485 (68.7)	706 (100.0)		
Seasons						
Dry cool seasons	99 (38.8)	38 (14.9)	118 (46.3)	255 (100.0)	3.98	0.408
Dry hot seasons	154 (40.4)	51 (30.4)	176 (46.2)	381 (100.0)		
Rainy seasons	170 (38.4)	81 (18.3)	92 (43.3)	443 (100.0)		

There was a high association between outcomes of supplementary feeding programs and the length of stay ($p<0.01$).Only 1% of the children were found to be uncured during the 1-8 weeks of stay. However, it was just the opposite in case of children who stayed for 9-12 weeks as the uncured rate was the highest at 68.7%.

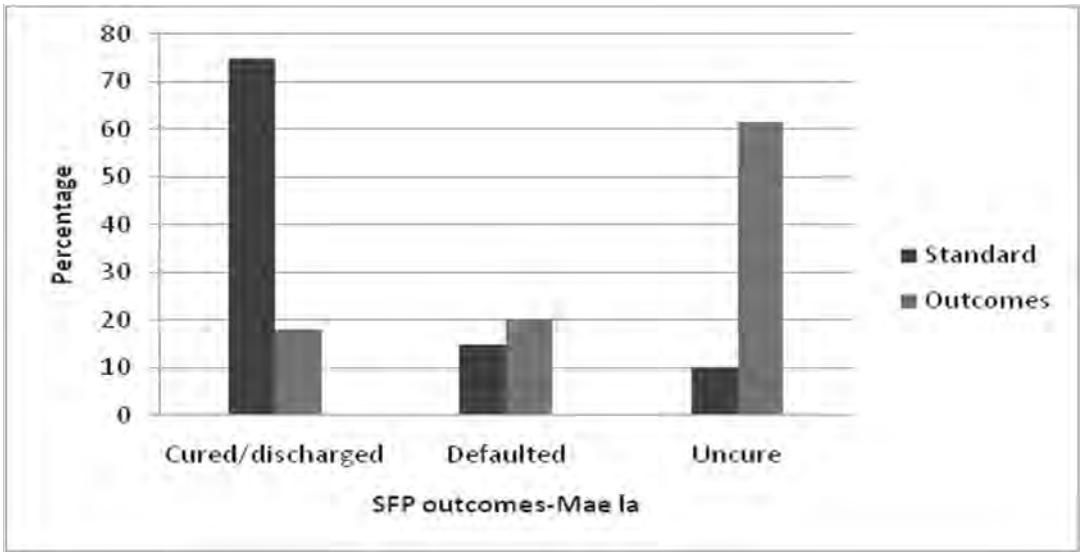
On analyzing the different supplementary feeding outcomes with the different seasons, it wasn't found to be significant at p value=0.408.The uncured rate was the highest and almost the same during dry cool (46.3%) and dry hot (46.2%) seasons. The defaulter rate varied between the three seasons with the highest defaulter rate during dry hot seasons at 30.4%.

Figure 3: Comparison of outcomes of supplementary feeding programs of three temporary shelters in Tak province with SPHERE standard.



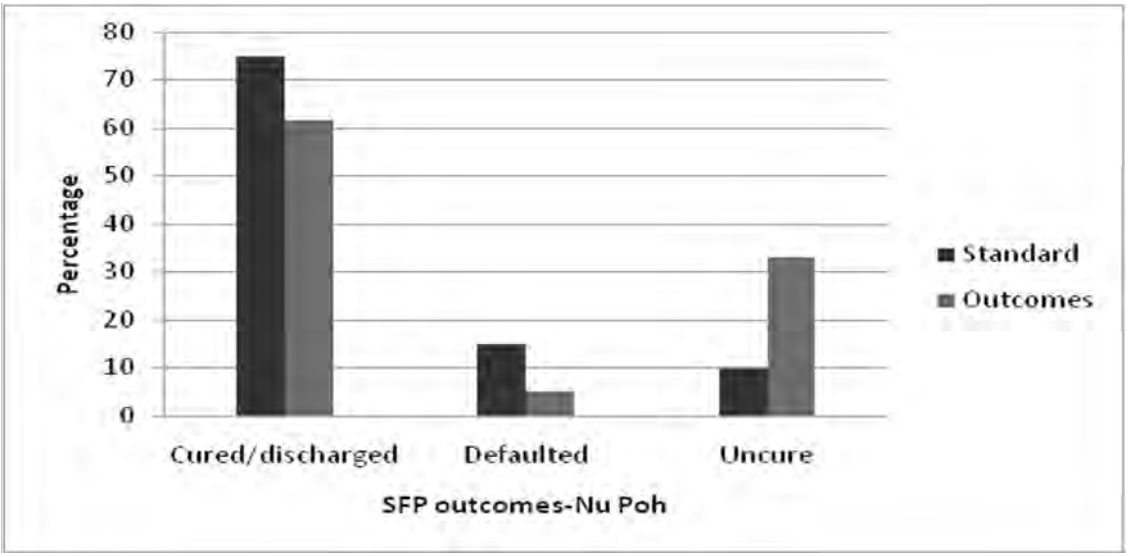
The overall analysis of SFP data from three temporary shelters in Tak province had shown very poor performance while comparing outcomes with SPHERE standards. Although defaulter rate was not very high compared to the SPHERE standard, cure rate was found very low compared to SPHERE standard leading to very high proportion of uncured children enrolled into SFP program in three temporary shelters.

Figure 4: SFP outcomes of Mae La camp compared to SPHERE standard



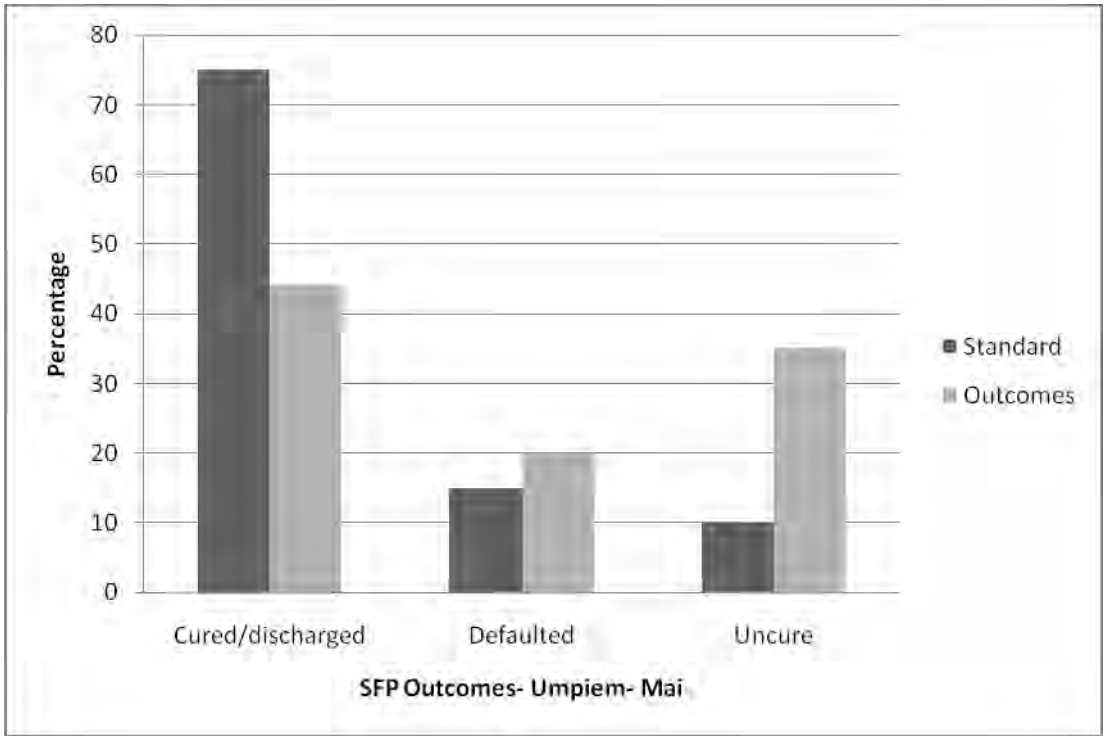
Mae-la temporary shelter showed lowest level of performance while comparing outcomes of supplementary feeding program. All outcome indicators were found below the SPHERE standard in Mae la temporary shelter, particularly cured/discharge rate was found very low in Mae la temporary shelter.

Figure 5: SFP outcomes of Nu Poh camp compared to SPHERE standard



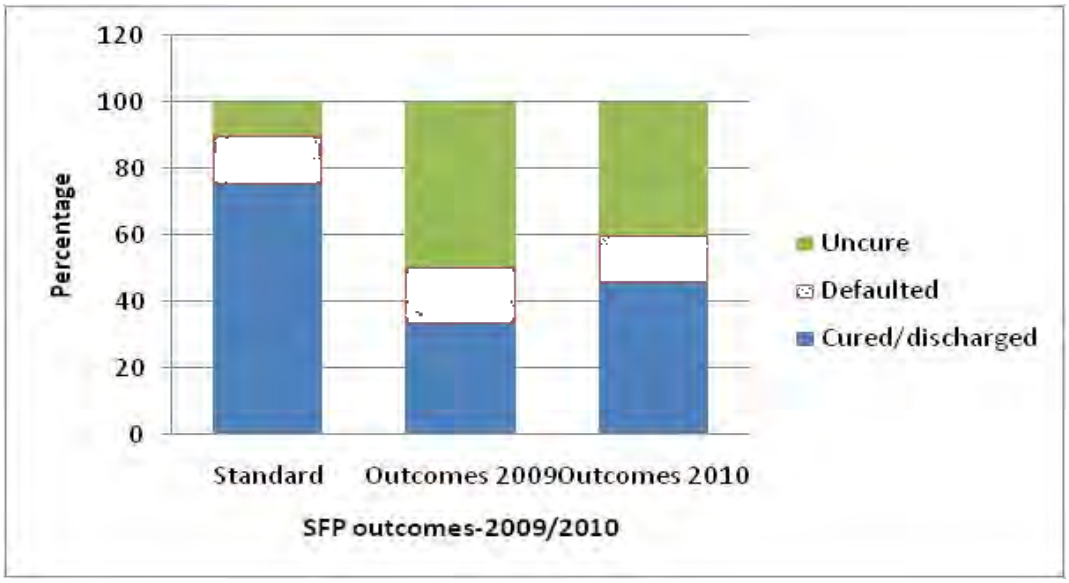
Nu Poh temporary shelter has relatively better performance compared to other temporary shelters in regards to outcomes of supplementary feeding programs. Defaulter rate remained lower and cure/discharge rate were relatively better in Nu Poh temporary shelter. However Nu Poh temporary shelter still has high un-cure rate if compared to SPHERE standard.

Figure 6: SFP outcomes of Umpiem Mai camp compared to SPHERE standard



The assessment showed moderate level of performance of supplementary feeding program of Umpiem Mai temporary shelter. All outcome indicators of SFP were found below the SPHERE standard in Umpiem Mai temporary shelter. Defaulter and non-cure rate were found very high if compared with SPHERE standard.

Figure 7: SFP outcomes of three temporary shelters during 2009/10 compared to SPHERE standard



As per the SPHERE standard handbook (2004) the cured rate should be >75%, defaulter rate should be <15% and uncured rate should be <10%. The assessment of performance of supplementary feeding programs in three temporary shelters in Tak province has shown all outcome indicators below the SPHERE standard. While looking at performance of two years, some improvements have observed in 2010 compared to 2009 in all three temporary shelters in Tak province. The data analysis of supplementary feeding programs of three temporary shelters showed positive outcomes in 2010 compared to 2009.

4.3. Results/Findings of In-depth interviews with health workers and mothers of children registered into supplementary feeding programs

A total of 11 health care providers and 17 mothers and caregivers from three temporary shelters were interviewed by researcher assistant using standard questionnaire guidelines prepared by the researcher. The realization of mothers/caregivers of the increase in weight of their children during supplementary feeding was highlighted, as the strength of targeted supplementary feeding programs in all three temporary shelters in their interview with health workers involved in

supplementary feeding programs. Strength was the use of take home rations that prevented the stigma associated with have to queue up for wet rations and provision of other nutrition related services along with supplementary feeding was highlighted by mothers/care givers in their interview.

4.4 Results of In-depth interviews with health workers

In-depth interviews were conducted to determine the provider‟s perceptions to capacity in providing services, assessment of nutritional status of children, recording of data into service registers, food distributions, and nutrition education and follow ups of children enrolled into supplementary feeding programs. A total of 11 health care workers involved in supplementary feeding programs from three temporary shelters were interviewed and guiding questions were divided into four main categories, namely;

- Capacities of health care providers in relation to supplementary feeding programs
- Outcomes of supplementary feeding programs
- Possible causes of poor performance of supplementary programs
- Suggestions for future improvements to supplementary feeding programs

Following are some responses from interviewee regarding supplementary feeding programs;

“We have protocols, training has been provided by our organization and our supervisors always help us while there is problems regarding data records and preparing reports.”

“Diarrhea, respiratory infections and low birth weight are main underline causes of malnutrition in our camps. Some mothers prefer to feed commercial snacks to their children which leads to malnutrition.”

“Regular growth monitoring helps mothers to know about weight gain and development of her child and also can take necessary measures on time.”

"Whenever supervisors come for monitoring, we always ask about our data recording and reporting from which we can know about accuracy of data. If they found something is not correct, we ask them to help us."

"During each visit we assess weight gain of child and give feedback to mothers and provide education about feeding and home care"

"If mothers missed their appoint date for visit, we ask CHW for follow up, but most of defaulted children either moved to villages in Burma or go for resettlement."

"Supplementary feeding program is successful because all the time our clinic is full of children."

"We know about outcomes of SFP but we are not using this information regularly. Generally we receive feedback from HIS but all people are not aware about such outcomes."

"We need to look at our report and review the progress on a regular basis to improve outcomes of SFP."

While asking about supplementary feeding program, all respondents were able to explain about objectives and purposes of supplementary feeding program in all three temporary shelters. "*We have protocols, training has been provided by our organization and our supervisors always help us while there is problems regarding data records and preparing reports*."(Said by one of the CHW from Nu-Poh Camp) Furthermore, health workers were found knowledgeable about the protocol of supplementary feeding programs. All health workers interviewed were able to explain about criteria for admission and discharged as stipulated in the SPF protocol. They have also reasonable good knowledge about anthropometric measurements and keeping records of children enrolled into supplementary feeding programs. Health

care providers were also aware about nutrition education, follow ups and defaulter tracing. "*During each visit we assess weight gain of child and give feedback to mothers and provide education about feeding and home care*" (said by one of the HW from Umpiem-Mai camp) and *"If mothers missed their appoint date for visit, we ask CHW for follow up, but most of defaulted children either moved to villages in Burma or go for resettlement"* (said by one of the nurse from Mae-La camp*).*

Health care providers were well aware about SPHERE standard regarding outcomes of supplementary feeding programs in Nu Poh and Umpiem Mai temporary shelters, where as health care providers of Mae La temporary shelter have relatively low level of knowledge regarding outcomes of supplementary feeding programs. In general all health workers involved in supplementary feeding programs know minimum standards of outcomes of SFP *"We know about outcomes of SFP but we are not using this information regularly. Generally we receive feedback from HIS but all people are not aware about such outcomes."* And *"We need to look at our report and review the progress on a regular basis to improve outcomes of SFP"* (said by one of the HW from Nu-Poh camp).While asking about performance of supplementary feeding programs of their respective temporary shelters, health workers think that performance is good in Nu Poh and Umpiem Mai, where as health workers of Mae La temporary shelter mentioned that performance of SFP was not good. Furthermore, interview of health workers in Mae La revealed that of very poor cure rate, high defaulter rate and long average length of stay in supplementary feeding program.

From the quantitative data analysis now, we can say that Umpiem Mai and Nu Poh temporary shelters have relatively higher cure rate and lower defaulter rate but Mae La temporary shelter has poor performance of supplementary feeding programs in three temporary shelters, following reasons were given by health care providers.

a. **Low cure rate:** Mae La has recorded lowest cure rate compared to other two temporary shelters. Although, Nu Poh and Umpiem Mai have better cure rates but far below the SPHERE standard. Majority of health workers mentioned sharing of SFP foods with other family members, particularly children, not feeding supplementary food to the child as prescribed by health workers, sale of food in market or exchange for other foods, children are habitual to snacks available in market rather than food provided by SFP are as main reasons of low cure rate of supplementary feeding programs. Some health worker also mentioned about illness of children particularly diarrhea and respiratory infections for not gaining weight within stipulated time of SFP *"Diarrhea, respiratory infections and low birth weight are main underline causes of malnutrition in our camps. Some mothers prefer to feed commercial snacks to their children which leads to malnutrition"* (said by one of the HW from Mae-la).

b. **High Defaulter rate:** Mae La and Umpiem Mai recorded higher defaulter rate compared to Nu Poh temporary shelter. Generally, mothers/caregivers should bring their child to SFP clinic each week for assessment and collection of food. If mothers and caregivers failed to bring their child during appointment date, such children will be considered defaulted. Question was asked to health workers about possible reasons of high defaulter rate in three temporary shelters. Frequent movement of families outside of camps and ongoing third country resettlement were the main causes of high defaulter according to health workers. Many refugee families particularly in Mae La and Umpiem Mai move outside camps in search of seasonal jobs and back and forth to Burma. Third country resettlement process also made children defaulted from supplementary feeding program. Health workers also mentioned that families residing inside camps have been bringing their children for weekly follow ups and ration collection without

interruption. Since most of children being defaulter due to outside movement and third country resettlement, follow up is impossible.

c. **Longer period of supplementary feeding to malnourished children:** The average length of stay for supplementary feeding program is eight weeks. Majority of children with supplementary feeding should gain weight after eight weeks but average length of stay of supplementary feeding programs in three temporary shelters in Tak province was found more than eight weeks. The reasons behind longer period of stay in supplementary feeding programs were relevant to low cure rate. Health workers have mentioned the same reasons for low cure rate and longer average length of stay of supplementary feeding programs in three temporary shelters in Tak province.

While asking to health workers about their suggestions for future improvements in supplementary feeding programs, they mentioned that performance of SFP has improved in 2010 compared to 2009. Training to health workers on case management, nutrition education and record keeping were suggested by health workers for improvement of supplementary feeding programs. Periodic review of SFP was also suggested to look at performance and timely actions for improvements. Majority of health workers appreciated the feedback provided to them through health information system reports but regular internal monitoring of outcomes and planning were suggested by health workers for improvements.

4.5 Results of In-depth interviews with mothers and caregivers

In-depth interviews were conducted with mothers and caregivers to determine the recipient‟s perceptions and behavioral response to food distribution, cultural acceptability of foods and the community perception of supplementary feeding program. A total of 17 mothers and caregivers were interviewed and the guiding questions were mainly focused on four main categories as mentioned here under.

a. Recipient‟s response to supplementary feeding

b. Cultural acceptability of supplementary foods
c. Community perceptions about supplementary feeding
d. Suggestions for future improvements to supplementary feeding programs.

Responses of mothers and caregivers on above mentioned areas are summarized hereunder with some important statements;

"Health workers are helpful and teach us how to prepare and feed our children."

"Asiamix is good because it contains all nutrients and help to weight gain of my child. I am feeding all supplementary food to my child as advised by health workers."

"I tried to feed supplementary food to my child but only one time, because the food is not enough to give all children. Rest of the time I give ordinary food to my child."

"My child does not like Asiamix but likes snacks bought from market"

"Some people in our neighborhood sell supplementary food into market."

"Every time when I bring my child for SFP, I ask about weight gain and I myself can know about the progress of my child since he is playing and look happy."

"I have three children and food is provided only for one child. I give food to all children and it is not enough to them."

"We need some training about foods. Which food is good for children and which are not good for them. People think that snacks are better and easily available and easy to make"

a. Recipient's response to supplementary feeding and cultural acceptability

One of the assumptions made in the Child Supplementary Feeding Program was that, once distributed to households food would be acceptable and would be given to the children. It was therefore necessary to ascertain the validity of these assumptions in the assessment. Mothers were asked to comment on how acceptable the precooked take home dry ration of Asiamix was. Questions were focused on variables like ease of preparation, responses of children, and if they would have preferred any other type of supplementary food. Most mothers liked Asiamix because they said *"it contained all nutrients"* and that it *"caused weight gain in a few months"*. The interview questions were intended to find out the perception of mothers on the SFP, and whether they followed the feeding instructions given. The results from this discussion indicated that most mothers would have preferred a larger daily ration of Asiamix. This may have been due to the lack of general food distribution to complement the Child Supplementary Feeding Program. All mothers responded that their children improved in nutrition and health status. This improvement was seen through increase in weight for height as shown on baby card, physical appearance of the child, improved appetite and the child being happier and playing with others.

It was also revealed that some mothers did not feed their child with supplementary food provided to them because children did not like to eat Asiamix. This was mainly due to widely availability of commercial snacks to which children are habitual to such snacks *"My child does not like Asiamix but likes snacks bought from market"* (said by one of the mother"s from Mae-La camp). Some mothers also mentioned that food provided based on target feeding is not enough since other children who are not malnourished also share the same food and the malnourished one does not get adequate nutrients *"I tried to feed supplementary food to my child but only one time, because the food is not enough to give all children. Rest of the time I give ordinary food to my child" (*said by one of the mother"s from Mae-La camp).

b. Community perceptions about supplementary feeding

Since challenges were reported on implementing targeted supplementary feeding programs in communities it was important to get first hand information from mothers on their perception. This could be used to improve implementation of supplementary feeding program. Some mothers who were interviewed indicated targeted feeding caused conflicts with neighbors who did not receive supplements for their children. A few mothers still preferred target feeding because it helped under- weight children to catch in growth and reduce malnutrition.

c. Suggestions for future improvements of supplementary feeding program

These questions were intended to elicit ideas from mothers and caregivers as to how the supplementary feeding program could best be implemented in future. Some mothers/caregivers indicated their interest in training on nutritional enhancement of complementary foods. They mentioned that there is a wide- spread poor practice within communities of using complementary foods, which are poor in nutritional quality. This often results in misuse of supplementary foods provided to children and mothers continue giving such low quality of food instead of food provided from SFP. Some mothers/caregivers also mentioned to provide food supplement to all children under the age of five. Mothers also suggested providing food supplements for at least 2 weeks instead of current one week supply.

CHAPTER V
DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Discussion

This report presents what we believe is a first performance evaluation of supplementary feeding programs under- five years children from three temporary shelters living in Tak province.

The assessment of performance of supplementary feeding programs in three temporary shelters in Tak province documented that outcomes of supplementary feeding program do not meet SPHERE standard. Outcomes of Nu Poh and Umpiem Mai temporary shelters were found better compared to Mae La camp. Most of indicators of supplementary feeding programs were found below the set standard according to SPHERE. However, there were some improvements observed in 2010 compared to 2009 in all three temporary shelters, the overall cure rate remained very low and high defaulter rates particularly in Mae la and Umpiem Mai temporary shelters. Similar study i.e., analyzing the effectiveness of the dry supplementary feeding programs in crisis situation in Liberia, Goma, Burundi shows there were satisfactory SFP results do not necessarily indicate improved nutritional status of the population (F, Vautier et al., 1999).

The study shows that there was effectiveness for weight gain in children younger than two years. And the study done by the Vivaleite Project is effective for weight gain in children younger than two years, once children exposed to the program show higher mean z-scores of weight-for-age than those not exposed (Augusto, R. A.,2010).

Likewise study done in different country by different authors conclude that due to the lack of formal evaluations of SFPs in refugee populations has been highlighted by (Godfrey ,1986) in a review of program results using different outcome measurements. And study done in Ethiopian refugees in Sudan (Barnabas. *et*

al., 1982) reported a weight gain in 54% of children enrolled SFPs in 1981; (Gibb, 1986) found a weight gain between 23% and 84% in 1985; (Simmonds & Brown, 1979) observed among Zairian refugees in Angola in 1978 that 42.9% of the beneficiaries of supplementary feeding cares improved their weight for height percentage

Sharing of supplemental foods with other family members, sale or exchange of supplemental foods with other foods, not feeding children as prescribed by health workers by mothers and caregivers were the main reasons for low cure rate in all three temporary shelters. Although, supplemental foods were culturally accepted by community, some children were habitual to commercial food snacks and rather interested to eat supplemental food.

While malnutrition is influenced by a various combination of long-term food deficiency, poor quality diet, and low economic status, acute malnutrition is mainly attributable to illness and/or shortage of food (TBBC, 2007).SFPs can rapidly cure a large number of malnourished children in camp as well as rural populations. Appropriate medical care in SFPs and trust between beneficiaries and SFP staff both seem to positively influence outcome indicators (F. Vautier et al., 1999).

The reasons for high defaulter rate were found mainly due to movement of temporary shelters families outside of shelters for search of seasonal jobs, moving to villages inside Myanmar and ongoing third country resettlement. As mentioned by health workers and mothers, defaulter amongst families residing inside camp is very less.

Training to health workers on case management, record keeping and nutrition education were suggested by health care providers for future improvements of supplementary feeding programs in temporary shelters. Community nutrition education on complementary foods and providing supplementary feeding to all under-five children irrespective of their nutritional status were also suggested by mothers and care givers. Periodic review of outcomes of supplementary feeding programs at

local level as suggested by health care providers would better help to devise strategies for improving outcomes of supplementary feeding programs.

Some fact regarding acute malnutrition is appropriate feeding practices that protect infants feeding practices and promote their health are not being implemented due to poor training, lack of clear guidelines or lack of assessment of the problems. There is also a lack of available weaning food available to young children.

5.2 Conclusions

As we know malnutrition remains a major public health problem throughout the developing world and is an underlying factor in over 50% of the 10-11 million children under 5 years who die each year of preventable causes (Black, et.al 2003; Caulfield, et.al, 2002; Rice, et.al, 2000 and Pelletier, et.al, 2003).

The secondary data provided by the organization CCSDPT of under-five year‟s children who were enrolled in the supplementary feeding programs from this study was collected in Tak province of Thailand in March 2011. The main purpose of this study was to identify the outcomes assessment for children supplementary feeding programs implemented in three temporary shelters in Tak province. This cross- sectional study including secondary data on 1079 children aged between 5 and 59 months enrolled in supplementary feeding programs of three temporary shelters in Tak province, Thailand, between 2009 and 2010 were analyzed

And this study replicates, 51.9 % were male and 48.1 % were female. Similarly 57.18 % were among 6-24 months and 42.82 % were among 25-59 months age groups. The overall cure rate was 39.2 % (SPHERE standard >75 %), defaulter rate was 15.8 % (SPHERE standard<15 %) and no death rate. Majority of children (65.4%) had more than 8 weeks of stay (SPHERE standard <8 weeks) during their feeding period in three temporary shelters. The assessment of performance of supplementary feeding programs in three temporary shelters in Tak province has shown all outcome indicators below the SPHERE standard.

The assessment of performance of supplementary feeding programs in three temporary shelters in Tak province has shown all outcome indicators below the SPHERE standard. While looking at performance of two years, some improvements have observed in 2010 compared to 2009 in all three temporary shelters in Tak province. The data analysis of supplementary feeding programs of three temporary shelters showed positive outcomes in 2010 compared to 2009.

5.3 Recommendations

Based on the results of this assessment and new development practices regarding supplementary feeding programs, following recommendations are made for improving outcomes of supplementary feeding programs in temporary shelters in Tak Province.

1. **Policy makers**: This assessment had revealed some gaps which need to be addressed at policy level for improving outcomes of supplementary feeding program in temporary shelters in Tak province.
   a. Review existing protocol of supplementary feeding program for increasing duration of food supplementation to children those likely to move out of shelters to avoid further deterioration of nutritional status of children and reduce high defaulter rate.
   b. Changes in recording system particularly for those children going for resettlement should not be considered as defaulter since these children are transferred out from temporary shelters.
   c. Replacement of currently used Asiamix by ready-to-use-food (RUTF) could have better results due to high energy density and easy to use by mothers and caregivers (Caulfield LE, Huffman SL, Piwoz EG, 1999 and Manary MJ et.al., 2004).

2. **Implementing organizations:** Health agencies involved in implementation of supplementary feeding programs have greater role for improving outcomes and quality of program and should focus on;

a. Training to health workers on case management, nutrition education and recording would strengthen supplementary feeding program and to better understand standards or outcomes of the program.
b. Focus on community nutrition activities to emphasize on complementary feeding, breast feeding for young children and food hygiene would help to reduce malnutrition and promote better use of supplemental foods.
c. Periodic review of outcomes on a monthly basis would help health care providers about the status of outcomes of supplementary feeding programs. Such an activity would provide opportunities for finding better ways and also help to improve program outcomes.

3. **Health care providers:** Health care providers involved in supplementary feeding program can play important role in improving outcome of program;
   a. Proper use of SFP protocol while providing services, particularly to follow criteria for admission and discharge of children enrolled into supplementary feeding program.
   b. Strengthen nutrition education to mothers based on individual program and better counseling to mothers on feeding practices and appropriate homecare of children.
   c. Use of SFP data for program improvement particularly for defaulter tracing and education to mothers.

4. **Mothers/care givers:** Mothers and care givers are integral part of SFP and should act accordingly for improving nutritional status of children;

a. Provide supplementary foods to children as advised by health workers, particularly in adequate quantity.
b. Avoid feeding low calorie commercial snacks to children instead of recommended supplementary foods.
c. Continue breast feeding for until the age of two.
d. Seek timely medical care, if the child has some underlying medical problems.

5.3.1 Recommendation for further research:

Cross-sectional study cannot explain the actual reason behind the changes in malnutrition and cannot explain causal relationship between independent and dependent variables. So, longitudinal study is needed to identify the casual relationship between independent and dependent variables further studies.

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APPENDICES

APPENDIX A:
In-depth Interview Guidelines

Interview guidelines for health workers involved in SFP in temporary shelters in Tak Province, Thailand

Note for interviewer: please introduce yourself and explain the purpose and objective of this study. Ask about the willingness of health providers who involved in SFP to participate in the study and if the interviewee agreed to be interviewed then proceed for interview. Consent of the health providers is must for this study.

1. What are general characteristics of informants? For example, their name, age, marital status, education, religion, jobs post and so on?
2. From how long they have worked in this program? To what extent they involve in this program (job description and responsibility)
3. How do they explain about the SFP in terms of objectives, implementation and expected outcomes?
4. According to their experiences in this SFP,
    a. What are the most common causes/sign symptoms of malnutrition among under-five children in this camp?
    b. What are factors influencing malnutrition of under-five children in this camp?
    c. What are other diseases/ illness mostly found among malnourished children?
5. What are services they provide regarding SFP? How do they implement those services?
    a. What are criteria for admission on/exit from SFP program for under-five children they use?
    b. Which anthropometric indices are being used for measuring growth monitoring of under-five children in SFP?

c. How do they provide services regarding enrollment, growth monitoring, demonstration, nutritional education/advice, providing SFP food?

d. Do they face any problems in providing SFP, such as irregularity of visits, incompliance and so on? How do they solve those problems?

e. If child is defaulting how do you follow them? Do you have any special activities to solve those defaulting rate?

6. What are techniques they use to encourage/motivate mothers for bringing children for regular clinic visit? What do you do if mothers do not bring their children for regular visit?

7. How do they manage data recording of malnourished children in each visit?

    a. What particular data they record in SFP moderate malnutrition register?

    b. How do they use results of nutritional assessment of malnourished children?

    c. How do they think about the advantage/disadvantages of their data management?

8. What particular area they cover during nutritional sessions in SFP?

9. What could be the possible causes of low/high cure rates in SFP in their opinion?

10. In which particular age groups do they found (<1 year, 13-24 months, 25 + months) low/high cure rates and why?

11. How do they assess SFP in their camp?

    a. Do they have any assessment of this SFP before and currently? If Yes, what are the results of that assessment? Do they have any plan of action regarding the result of the assessment?

    b. How do you describe the success of SFP in your camp?

c. Do you get any comment or suggestion from mothers/care givers? If Yes, what kind of suggestion do they give?

d. Do you get any feedback on SFP from TBBC or CCSDPT/HIS program? If Yes, what kind of feedback do they give?

11. How do they think about adequacy, quality and efficacy of facilities, resources, system management for SFP in their camp? Is there any technical support/ obstacle for implementing SFP?

13. Which areas do they think that their strength and weakness of their programs?

14. What are the challenges you are meeting in implementing this Program?

APPENDIX B:

Interview guidelines for mothers/care givers of under-five children enrolled into supplementary feeding programs in temporary shelters

Note for interviewer: please introduce yourself and explain the purpose and objective of this study. Ask about the willingness of mothers/care-givers to participate in the study and if the interviewee agreed to be interviewed then proceed for interview. Consent of the mothers/care-givers is must for this study.

1. What are general characteristics of informants? For example, their name, age, education, number of children, ethnics, and so on?
2. Do they know about exclusive breast feeding (within 6 month old)? Were their children exclusively breasted fed? If no, what else did they feed to their children?
3. What are the problems/diseases making them to bring their children in this clinic?
4. For the failure cases, from how long their children have received supplementary feeding in this clinic? And why their children are not recovered in time? How do they feel?
5. For the success cases, from how long their children received supplementary feeding in this clinic? Why their children could be recovered in time? How do they feel?
6. What kinds of food that their children received/ are receiving from the Camp?
7. Do their children like SFP food? And why/why not? If No, what kinds of food do their children like?
8. How did/do they feed SFP food to their children at home? Do/did they feed all foods provided by SFP? And why/why not? Do/did they feed other foods than those provided by SFP? And why/why not?
9. Do they have any problems/obstacles in preparing and feeding SFP to their children? If Yes, what are those problems?

10. Do they know about continuation breast feeding (up to 2 years old)? Do they perform continuation breast feeding along with SFP food? And why/why not?
11. What other services/advise do/did they receive from the staff regarding nutrition? How do you feel with the services/advise they received? And why?
12. How do/did they bring their children to the clinic? Do/did they have any problems in bringing their children each week in the clinic? If yes what sorts of problems? How do/did they solve their problems?
13. How do they think regarding to SFP in terms of benefits, procedure of demonstration and education, place (clinic site) and equipment, staffs, and so on? What would be their suggestions for the improvement of SFP in this camp?

APPENDIX C:

Z score reference tables and weight/height measuring tools used for SFP in temporary shelters (NCHS, CDC, WHO Reference Table 1982)

z score Reference Table: Weight for length/height for boys 49 -130 cm

အရပ်အမြင့် (cm)	ကိုယ်အလေးချိန် (kg) z score				အရပ်အမြင့် (cm)	ကိုယ်အလေးချိန် (kg) z score			
	median	-1	-2	-3		median	-1	-2	-3
49	3.1	2.8	2.5	2.1	72	9.1	8.3	7.7	6.8
49.5	3.2	2.9	2.5	2.1	72.5	9.2	8.4	7.8	6.9
50	3.3	2.9	2.6	2.2	73	9.3	8.6	7.9	7.0
50.5	3.4	3.0	2.6	2.2	73.5	9.5	8.7	8.0	7.1
51	3.5	3.1	2.7	2.2	74	9.6	8.8	8.1	7.2
51.5	3.6	3.1	2.8	2.3	74.5	9.7	8.9	8.2	7.3
52	3.7	3.2	2.8	2.3	75	9.8	9.0	8.3	7.4
52.5	3.8	3.3	2.9	2.4	75.5	9.9	9.1	8.4	7.5
53	3.9	3.4	3.0	2.4	76	10.0	9.2	8.5	7.6
53.5	4.0	3.5	3.1	2.5	76.5	10.2	9.3	8.6	7.7
54	4.1	3.6	3.2	2.6	77	10.3	9.4	8.7	7.8
54.5	4.2	3.7	3.3	2.6	77.5	10.4	9.5	8.8	7.9
55	4.3	3.8	3.3	2.7	78	10.5	9.7	8.9	8.0
55.5	4.5	3.9	3.5	2.8	78.5	10.6	9.8	9.0	8.1
56	4.6	4.0	3.6	2.9	79	10.7	9.9	9.1	8.2
56.5	4.7	4.1	3.7	3.0	79.5	10.8	10.0	9.2	8.2
57	4.8	4.3	3.8	3.1	80	10.9	10.1	9.3	8.3
57.5	5.0	4.4	3.9	3.2	80.5	11.0	10.1	9.4	8.4
58	5.1	4.5	4.0	3.3	81	11.1	10.2	9.5	8.5
58.5	5.2	4.6	4.1	3.4	81.5	11.2	10.3	9.6	8.6
59	5.4	4.8	4.2	3.5	82	11.3	10.4	9.6	8.7
59.5	5.5	4.9	4.4	3.6	82.5	11.4	10.5	9.7	8.8
60	5.7	5.0	4.5	3.7	83	11.5	10.6	9.8	8.8
60.5	5.8	5.1	4.6	3.8	83.5	11.6	10.7	9.9	8.9
61	5.9	5.3	4.8	4.0	84	11.7	10.8	10.0	9.0
61.5	6.1	5.4	4.9	4.1	84.5	11.8	10.9	9.9	9.1
62	6.2	5.6	5.0	4.2	85	12.1	11.0	10.0	8.9
62.5	6.4	5.7	5.2	4.3	85.5	12.2	11.1	10.1	8.9
63	6.5	5.8	5.3	4.5	86	12.3	11.2	10.2	9.0
63.5	6.7	6.0	5.4	4.6	86.5	12.5	11.3	10.3	9.1
64	6.8	6.1	5.6	4.7	87	12.6	11.5	10.4	9.2
64.5	7.0	6.3	5.7	4.9	87.5	12.7	11.6	10.5	9.3
65	7.1	6.4	5.8	5.0	88	12.8	11.7	10.6	9.4
65.5	7.3	6.5	6.0	5.1	88.5	12.9	11.8	10.7	9.5
66	7.4	6.7	6.1	5.3	89	13.0	11.9	10.8	9.6
66.5	7.6	6.8	6.2	5.4	89.5	13.1	12.0	10.9	9.7
67	7.7	7.0	6.4	5.5	90	13.3	12.1	11.0	9.8
67.5	7.8	7.1	6.5	5.7	90.5	13.4	12.2	11.1	9.9
68	8.0	7.3	6.6	5.8	91	13.5	12.3	11.2	9.9
68.5	8.1	7.4	6.8	5.9	91.5	13.6	12.4	11.3	10.0
69	8.3	7.5	6.9	6.0	92	13.7	12.5	11.4	10.1
69.5	8.4	7.7	7.0	6.2	92.5	13.9	12.6	11.5	10.2
70	8.5	7.8	7.2	6.3	93	14.0	12.8	11.6	10.3
70.5	8.7	7.9	7.3	6.4	93.5	14.1	12.9	11.7	10.4
71	8.8	8.1	7.4	6.5	94	14.2	13.0	11.8	10.5
71.5	8.9	8.2	7.5	6.7	94.5	14.3	13.1	11.9	10.6

z score Reference Table: Weight for length/height for boys 49 -130 cm

အရပ်အမြင့် (cm)	ကိုယ်အလေးချိန် (kg) z score				အရပ်အမြင့် (cm)	ကိုယ်အလေးချိန် (kg) z score			
	median	-1	-2	-3		median	-1	-2	-3
95	14.5	13.2	12.0	10.7	114.5	20.2	18.5	16.9	15.0
95.5	14.6	13.3	12.1	10.8	115	20.3	18.6	17.1	15.2
96	14.7	13.4	12.2	10.9	115.5	20.5	18.8	17.2	15.3
96.5	14.8	13.5	12.4	11.0	116	20.7	18.9	17.4	15.5
97	15.0	13.7	12.5	11.0	116.5	20.9	19.1	17.5	15.6
97.5	15.1	13.8	12.6	11.1	117	21.1	19.3	17.7	15.8
98	15.2	13.9	12.7	11.2	117.5	21.2	19.5	17.9	15.9
98.5	15.4	14.0	12.8	11.3	118	21.4	19.6	18.0	16.1
99	15.5	14.1	12.9	11.4	118.5	21.6	19.8	18.2	16.2
99.5	15.6	14.3	13.0	11.5	119	21.8	20.0	18.4	16.4
100	15.7	14.4	13.1	11.6	119.5	22.0	20.2	18.5	16.6
100.5	15.9	14.5	13.2	11.7	120	22.2	20.4	18.7	16.7
101	16.0	14.6	13.3	11.8	120.5	22.4	20.6	18.9	16.9
101.5	16.2	14.7	13.4	11.9	121	22.6	20.7	19.1	17.0
102	16.3	14.9	13.6	12.0	121.5	22.8	20.9	19.2	17.2
102.5	16.4	15.0	13.7	12.1	122	23.0	21.1	19.4	17.4
103	16.6	15.1	13.8	12.2	122.5	23.2	21.3	19.6	17.5
103.5	16.7	15.3	13.9	12.3	123	23.4	21.5	19.8	17.7
104	16.9	15.4	14.0	12.4	123.5	23.6	21.7	20.0	17.9
104.5	17.0	15.5	14.2	12.6	124	23.9	21.9	20.2	18.0
105	17.1	15.6	14.3	12.7	124.5	24.1	22.1	20.4	18.2
105.5	17.3	15.8	14.4	12.8	125	24.3	22.3	20.5	18.4
106	17.4	15.9	14.5	12.9	125.5	24.5	22.5	20.7	18.6
106.5	17.6	16.1	14.7	13.0	126	24.8	22.8	20.9	18.7
107	17.7	16.2	14.8	13.1	126.5	25.0	23.0	21.1	18.9
107.5	17.9	16.3	14.9	13.2	127	25.2	23.2	21.3	19.1
108	18.0	16.5	15.0	13.4	127.5	25.5	23.4	21.5	19.2
108.5	18.2	16.6	15.2	13.5	128	25.7	23.6	21.7	19.4
109	18.3	16.8	15.3	13.6	128.5	26.0	23.8	21.9	19.6
109.5	18.5	16.9	15.4	13.7	129	26.2	24.1	22.1	19.8
110	18.7	17.1	15.6	13.8	129.5	26.5	24.3	22.3	19.9
110.5	18.8	17.2	15.7	14.0	130	26.8	24.5	22.5	20.1
111	19.0	17.4	15.9	14.1					
111.5	19.1	17.5	16.0	14.2					
112	19.3	17.7	16.1	14.4					
112.5	19.5	17.8	16.3	14.5					
113	19.6	18.0	16.4	14.6					
113.5	19.8	18.1	16.6	14.8					
114	20.0	18.3	16.7	14.9					

(Source: NCHS, CDC, WHO Reference Table 1982)

Z score Reference Table: Weight for length/height for girls 49 -130 cm

အရပ်အမြင့် (cm)	ကိုယ်အလေးချိန် (kg) z score				အရပ်အမြင့် (cm)	ကိုယ်အလေးချိန် (kg) z score			
	median	-1	-2	-3		median	-1	-2	-3
49	3.3	2.9	2.6	2.2	72	8.9	8.1	7.2	6.4
49.5	3.4	3.0	2.6	2.2	72.5	9.0	8.2	7.4	6.5
50	3.4	3.0	2.6	2.3	73	9.1	8.3	7.5	6.6
50.5	3.5	3.1	2.7	2.3	73.5	9.3	8.4	7.6	6.7
51	3.5	3.1	2.7	2.3	74	9.4	8.5	7.7	6.8
51.5	3.6	3.2	2.8	2.4	74.5	9.5	8.6	7.8	6.9
52	3.7	3.3	2.8	2.4	75	9.6	8.7	7.9	7.0
52.5	3.8	3.4	2.9	2.5	75.5	9.7	8.8	8.0	7.1
53	3.9	3.4	3.0	2.5	76	9.8	8.9	8.1	7.2
53.5	4.0	3.5	3.1	2.6	76.5	9.9	9.0	8.2	7.3
54	4.1	3.6	3.1	2.7	77	10.0	9.1	8.3	7.4
54.5	4.2	3.7	3.2	2.7	77.5	10.1	9.2	8.4	7.5
55	4.3	3.8	3.3	2.8	78	10.2	9.3	8.5	7.6
55.5	4.4	3.9	3.4	2.9	78.5	10.3	9.4	8.6	7.7
56	4.5	4.0	3.5	3.0	79	10.4	9.5	8.7	7.8
56.5	4.6	4.1	3.6	3.0	79.5	10.5	9.6	8.7	7.9
57	4.8	4.2	3.7	3.1	80	10.6	9.7	8.8	8.0
57.5	4.9	4.3	3.8	3.2	80.5	10.7	9.8	8.9	8.0
58	5.0	4.4	3.9	3.3	81	10.8	9.9	9.0	8.1
58.5	5.1	4.6	4.0	3.4	81.5	10.9	10.0	9.1	8.2
59	5.3	4.7	4.1	3.5	82	11.0	10.1	9.2	8.3
59.5	5.4	4.8	4.2	3.6	82.5	11.1	10.2	9.3	8.4
60	5.5	4.9	4.3	3.7	83	11.2	10.3	9.4	8.5
60.5	5.7	5.1	4.4	3.8	83.5	11.3	10.4	9.5	8.6
61	5.8	5.2	4.6	3.9	84	11.4	10.5	9.6	8.7
61.5	6.0	5.3	4.7	4.0	84.5	11.5	10.6	9.6	8.7
62	6.1	5.4	4.8	4.1	85	11.8	10.8	9.7	8.6
62.5	6.2	5.6	4.9	4.2	85.5	11.9	10.9	9.8	8.7
63	6.4	5.7	5.0	4.4	86	12.0	11.0	9.9	8.8
63.5	6.5	5.8	5.2	4.5	86.5	12.2	11.1	10.0	8.9
64	6.7	6.0	5.3	4.6	87	12.3	11.2	10.1	9.0
64.5	6.8	6.1	5.4	4.7	87.5	12.4	11.3	10.2	9.1
65	7.0	6.3	5.5	4.8	88	12.5	11.4	10.3	9.2
65.5	7.1	6.4	5.7	4.9	88.5	12.6	11.5	10.4	9.3
66	7.3	6.5	5.8	5.1	89	12.7	11.6	10.5	9.3
66.5	7.4	6.7	5.9	5.2	89.5	12.8	11.7	10.6	9.4
67	7.5	6.8	6.0	5.3	90	12.9	11.8	10.7	9.5
67.5	7.7	6.9	6.2	5.4	90.5	13.0	11.9	10.7	9.6
68	7.8	7.1	6.3	5.5	91	13.2	12.0	10.8	9.7
68.5	8.0	7.2	6.4	5.6	91.5	13.3	12.1	10.9	9.8
69	8.1	7.3	6.5	5.8	92	13.4	12.2	11.0	9.9
69.5	8.2	7.5	6.7	5.9	92.5	13.5	12.3	11.1	9.9
70	8.4	7.6	6.8	6.0	93	13.6	12.4	11.2	10.0
70.5	8.5	7.7	6.9	6.1	93.5	13.7	12.5	11.3	10.1
71	8.6	7.8	7.0	6.2	94	13.9	12.6	11.4	10.2
71.5	8.8	8.0	7.1	6.3	94.5	14.0	12.8	11.5	10.3

Source: NCHS, CDC, WHO Reference Table 1982)

Z score Reference Table: Weight for length/height for girls 49 -130 cm

အရပ်အမြင့် (cm)	ကိုယ်အလေးချိန် (kg) z score				အရပ်အမြင့် (cm)	ကိုယ်အလေးချိန် (kg) z score			
	median	-1	-2	-3		median	-1	-2	-3
95	14.1	12.9	11.6	10.4	114.5	19.7	18.0	16.3	14.6
95.5	14.2	13.0	11.7	10.5	115	19.9	18.2	16.5	14.8
96	14.3	13.1	11.8	10.6	115.5	20.1	18.4	16.6	14.9
96.5	14.5	13.2	11.9	10.7	116	20.3	18.5	16.8	15.0
97	14.6	13.3	12.0	10.7	116.5	20.4	18.7	16.9	15.2
97.5	14.7	13.4	12.1	10.8	117	20.6	18.9	17.1	15.3
98	14.9	13.5	12.2	10.9	117.5	20.8	19.0	17.3	15.5
98.5	15.0	13.7	12.3	11.0	118	21.0	19.2	17.4	15.6
99	15.1	13.8	12.4	11.1	118.5	21.2	19.4	17.6	15.8
99.5	15.2	13.9	12.5	11.2	119	21.4	19.6	17.7	15.9
100	15.4	14.0	12.7	11.3	119.5	21.6	19.8	17.9	16.1
100.5	15.5	14.1	12.8	11.4	120	21.8	20.0	18.1	16.2
101	15.6	14.3	12.9	11.5	120.5	22.0	20.1	18.3	16.4
101.5	15.8	14.4	13.0	11.6	121	22.2	20.3	18.4	16.5
102	15.9	14.5	13.1	11.7	121.5	22.5	20.5	18.6	16.7
102.5	16.0	14.6	13.2	11.8	122	22.7	20.7	18.8	16.8
103	16.2	14.7	13.3	11.9	122.5	22.9	20.9	19.0	17.0
103.5	16.3	14.9	13.4	12.0	123	23.1	21.1	19.1	17.1
104	16.5	15.0	13.5	12.1	123.5	23.4	21.3	19.3	17.3
104.5	16.6	15.1	13.7	12.2	124	23.6	21.6	19.5	17.4
105	16.7	15.3	13.8	12.3	124.5	23.9	21.8	19.7	17.6
105.5	16.9	15.4	13.9	12.4	125	24.1	22.0	19.9	17.8
106	17.0	15.5	14.0	12.5	125.5	24.3	22.2	20.2	17.9
106.5	17.2	15.7	14.1	12.6	126	24.6	22.4	20.1	18.1
107	17.3	15.8	14.3	12.7	126.5	24.9	22.7	20.4	18.2
107.5	17.5	15.9	14.4	12.8	127	25.1	22.9	20.6	18.4
108	17.6	16.1	14.5	13.0	127.5	25.4	23.1	20.8	18.6
108.5	17.8	16.2	14.6	13.1	128	25.7	23.3	21.0	18.7
109	17.9	16.4	14.8	13.2	128.5	25.9	23.6	21.2	18.9
109.5	18.1	16.5	14.9	13.3	129	26.2	23.8	21.4	19.0
110	18.2	16.6	15.0	13.4	129.5	26.5	24.1	21.6	19.2
110.5	18.4	16.8	15.2	13.6	130	26.8	24.3	21.8	19.4
111	18.6	16.9	15.3	13.7					
111.5	18.7	17.1	15.5	13.8					
112	18.9	17.2	15.6	14.0					
112.5	19.0	17.4	15.7	14.1					
113	19.2	17.5	15.9	14.2					
113.5	19.4	17.7	16.0	14.4					
114	19.5	17.9	16.2	14.5					

Source: NCHS, CDC, WHO Reference Table 1982)

NCHS/CDC sex combined references (1982), expressed as Z-Scores
Length assessed lying up to 84.5cm

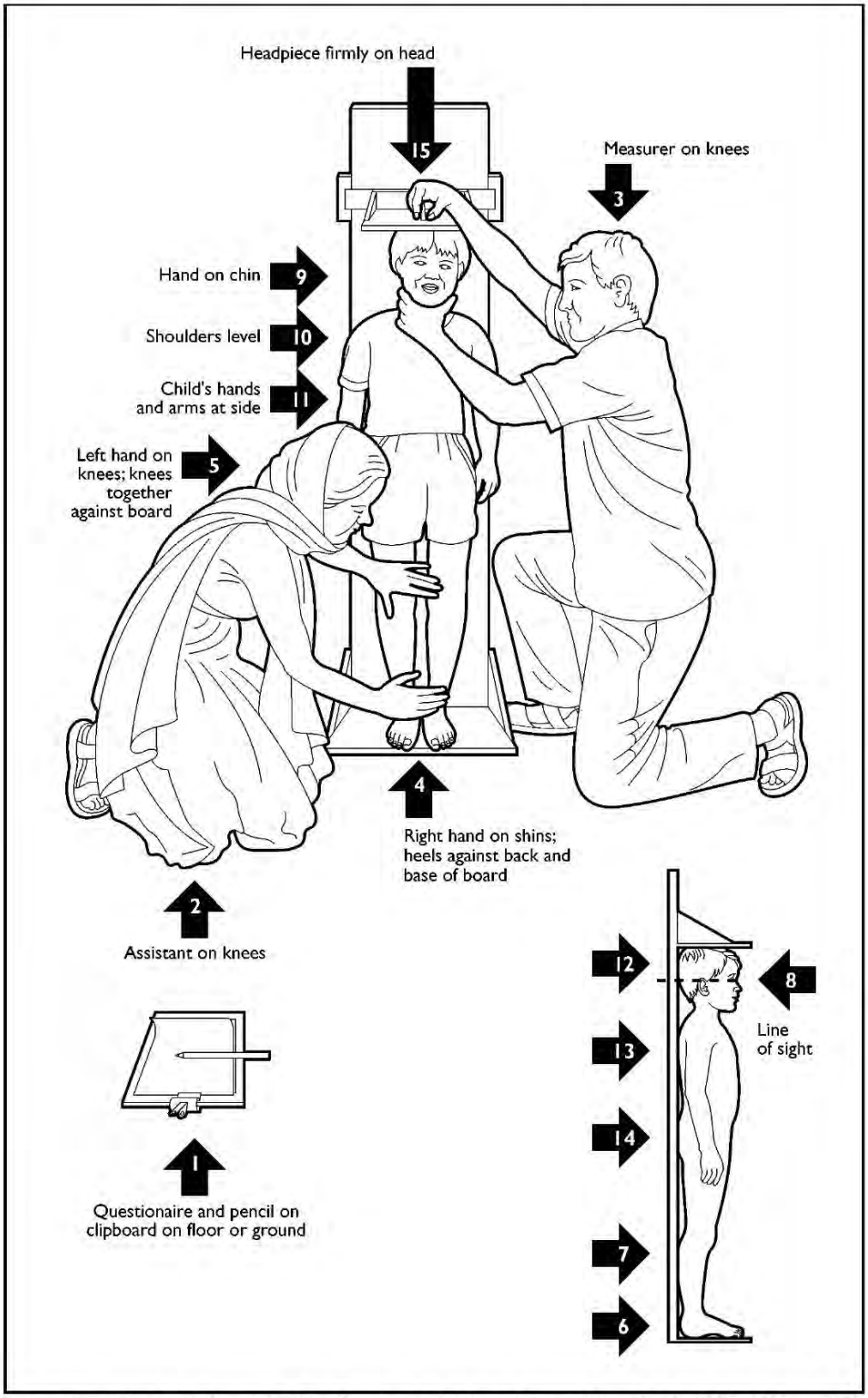
Length cm	Median kg	-1.5 Z-Score	-2 Z-Scores	-3 Z-Scores	-4 Z-Scores	Length cm	Median kg	-1.5 Z-Score	-2 Z-Scores	-3 Z-Scores	-4 Z-Scores
50.0	3.4	2.8	2.6	2.2	1.8	68.0	7.9	6.8	6.4	5.7	4.9
50.5	3.4	2.8	2.6	2.2	1.8	68.5	8.0	6.9	6.5	5.8	5.0
51.0	3.5	2.9	2.7	2.3	1.9	69.0	8.2	7.1	6.7	5.9	5.1
51.5	3.6	3.0	2.7	2.3	1.9	69.5	8.3	7.2	6.8	6.0	5.3
52.0	3.7	3.1	2.8	2.4	1.9	70.0	8.5	7.3	6.9	6.1	5.4
52.5	3.8	3.1	2.9	2.4	2.0	70.5	8.6	7.5	7.0	6.3	5.5
53.0	3.9	3.2	2.9	2.5	2.0	71.0	8.7	7.6	7.2	6.4	5.6
53.5	4.0	3.3	3.0	2.5	2.1	71.5	8.9	7.7	7.3	6.5	5.7
54.0	4.1	3.4	3.1	2.6	2.1	72.0	9.0	7.8	7.4	6.6	5.8
54.5	4.2	3.5	3.2	2.7	2.2	72.5	9.1	7.9	7.5	6.7	5.9
55.0	4.3	3.6	3.3	2.8	2.2	73.0	9.2	8.0	7.6	6.8	6.0
55.5	4.4	3.6	3.4	2.8	2.3	73.5	9.4	8.2	7.7	6.9	6.4
56.0	4.6	3.8	3.5	2.9	2.4	74.0	9.5	8.3	7.8	7.0	6.2
56.5	4.7	3.9	3.6	3.0	2.5	74.5	9.6	8.4	7.9	7.1	6.3
57.0	4.8	4.0	3.7	3.1	2.5	75.0	9.7	8.5	8.1	7.2	6.4
57.5	4.9	4.1	3.8	3.2	2.6	75.5	9.8	8.6	8.2	7.3	6.5
58.0	5.1	4.2	3.9	3.3	2.7	76.0	9.9	8.7	8.3	7.4	6.6
58.5	5.2	4.3	4.0	3.4	2.8	76.5	10.0	8.8	8.4	7.5	6.7
59.0	5.3	4.4	4.1	3.5	2.9	77.0	10.1	8.9	8.5	7.6	6.8
59.5	5.5	4.6	4.2	3.6	3.0	77.5	10.2	9.0	8.5	7.7	6.9
60.0	5.6	4.7	4.3	3.7	3.1	78.0	10.4	9.1	8.6	7.8	6.9
60.5	5.7	4.8	4.5	3.8	3.2	78.5	10.5	9.2	8.7	7.9	7.0
61.0	5.9	4.9	4.6	3.9	3.3	79.0	10.6	9.3	8.8	8.0	7.1
61.5	6.0	5.1	4.7	4.1	3.4	79.5	10.7	9.4	8.9	8.1	7.2
62.0	6.2	5.2	4.8	4.2	3.5	80.0	10.8	9.5	9.0	8.1	7.3
62.5	6.3	5.3	5.0	4.3	3.6	80.5	10.9	9.6	9.1	8.2	7.4
63.0	6.5	5.5	5.1	4.4	3.7	81.0	11.0	9.7	9.2	8.3	7.4
63.5	6.6	5.6	5.2	4.5	3.9	81.5	11.1	9.8	9.3	8.4	7.5
64.0	6.7	5.7	5.4	4.7	4.0	82.0	11.2	9.9	9.4	8.5	7.6
64.5	6.9	5.9	5.5	4.8	4.1	82.5	11.3	10.0	9.5	8.6	7.7
65.0	7.0	6.0	5.6	4.9	4.2	83.0	11.4	10.1	9.6	8.7	7.8
65.5	7.2	6.1	5.8	5.0	4.3	83.5	11.5	10.1	9.6	8.7	7.8
66.0	7.3	6.3	5.9	5.2	4.4	84.0	11.5	10.2	9.7	8.8	7.9
66.5	7.5	6.4	6.0	5.3	4.6	84.5	11.6	10.3	9.8	8.9	8.0
67.0	7.6	6.5	6.1	5.4	4.7						
67.5	7.8	6.7	6.3	5.5	4.8						

Height assessed standing from 85.0cm

Length cm	Median kg	-1.5 Z-Score	-2 Z-Scores	-3 Z-Scores	-4 Z-Scores	Length cm	Median kg	-1.5 Z-Score	-2 Z-Scores	-3 Z-Scores	-4 Z-Scores
85.0	12.0	10.4	9.8	8.7	7.7	108.0	17.8	15.5	14.7	13.2	11.6
85.5	12.1	10.5	9.9	8.8	7.7	108.5	18.0	15.7	14.8	13.3	11.7
86.0	12.2	10.6	10.0	8.9	7.8	109.0	18.1	15.8	15.0	13.4	11.8
86.5	12.3	10.7	10.1	9.0	7.9	109.5	18.3	15.9	15.1	13.5	11.9
87.0	12.4	10.8	10.2	9.1	8.0	110.0	18.4	16.0	15.2	13.6	12.0
87.5	12.5	10.9	10.3	9.2	8.1	110.5	18.6	16.2	15.4	13.8	12.2
88.0	12.6	11.0	10.4	9.3	8.2	111.0	18.8	16.4	15.5	13.9	12.3
88.5	12.8	11.1	10.5	9.4	8.2	111.5	18.9	16.5	15.7	14.0	12.4
89.0	12.9	11.2	10.6	9.5	8.3	112.0	19.1	16.7	15.8	14.2	12.5
89.5	13.0	11.3	10.7	9.6	8.4	112.5	19.3	16.8	15.9	14.3	12.6
90.0	13.1	11.4	10.8	9.6	8.5	113.0	19.4	16.9	16.1	14.4	12.8
90.5	13.2	11.5	10.9	9.7	8.6	113.5	19.6	17.1	16.2	14.6	12.9
91.0	13.3	11.6	11.0	9.8	8.6	114.0	19.8	17.3	16.4	14.7	13.0
91.5	13.4	11.7	11.1	9.9	8.7	114.5	19.9	17.4	16.5	14.8	13.1
92.0	13.6	11.8	11.2	10.0	8.8	115.0	20.1	17.6	16.7	15.0	13.3
92.5	13.7	11.9	11.3	10.1	8.9	115.5	20.3	17.7	16.8	15.1	13.4
93.0	13.8	12.0	11.4	10.2	9.0	116.0	20.5	17.9	17.0	15.3	13.5
93.5	13.9	12.1	11.5	10.3	9.0	116.5	20.7	18.1	17.2	15.4	13.7
94.0	14.0	12.2	11.6	10.4	9.1	117.0	20.8	18.2	17.3	15.6	13.8
94.5	14.2	12.3	11.7	10.4	9.2	117.5	21.0	18.4	17.5	15.7	13.9
95.0	14.3	12.4	11.8	10.5	9.3	118.0	21.2	18.5	17.6	15.8	14.1
95.5	14.4	12.5	11.9	10.6	9.4	118.5	21.4	18.7	17.8	16.0	14.2
96.0	14.5	12.6	12.0	10.7	9.4	119.0	21.6	18.9	18.0	16.2	14.3
96.5	14.7	12.8	12.1	10.8	9.5	119.5	21.8	19.1	18.1	16.3	14.5
97.0	14.8	12.9	12.2	10.9	9.6	120.0	22.0	19.3	18.3	16.5	14.6
97.5	14.9	13.0	12.3	11.0	9.7	120.5	22.2	19.4	18.5	16.6	14.8
98.0	15.0	13.1	12.4	11.1	9.8	121.0	22.4	19.6	18.7	16.8	14.9
98.5	15.2	13.2	12.5	11.2	9.8	121.5	22.6	19.8	18.8	16.9	15.0
99.0	15.3	13.3	12.6	11.3	9.9	122.0	22.8	20.0	19.0	17.1	15.2
99.5	15.4	13.4	12.7	11.4	10.0	122.5	23.1	20.2	19.2	17.3	15.3
100.0	15.6	13.6	12.8	11.5	10.1	123.0	23.3	20.4	19.4	17.4	15.5
100.5	15.7	13.7	12.9	11.6	10.2	123.5	23.5	20.6	19.6	17.6	15.6
101.0	15.8	13.8	13.0	11.7	10.3	124.0	23.7	20.7	19.7	17.7	15.7
101.5	16.0	13.9	13.2	11.8	10.4	124.5	24.0	21.0	19.9	17.9	15.9
102.0	16.1	14.0	13.3	11.9	10.4	125.0	24.2	21.2	20.1	18.1	16.0
102.5	16.2	14.1	13.4	12.0	10.5	125.5	24.4	21.3	20.3	18.2	16.2
103.0	16.4	14.3	13.5	12.1	10.6	126.0	24.7	21.6	20.5	18.4	16.3
103.5	16.5	14.4	13.6	12.2	10.7	126.5	24.9	21.8	20.7	18.6	16.4
104.0	16.7	14.5	13.7	12.3	10.8	127.0	25.2	22.0	20.9	18.7	16.6
104.5	16.8	14.6	13.8	12.4	10.9	127.5	25.4	22.2	21.1	18.9	16.7
105.0	16.9	14.7	14.0	12.5	11.0	128.0	25.7	22.4	21.3	19.1	16.9
105.5	17.1	14.9	14.1	12.6	11.1	128.5	26.0	22.6	21.5	19.2	17.0
106.0	17.2	15.0	14.2	12.7	11.2	129.0	26.2	22.8	21.7	19.4	17.1
106.5	17.4	15.1	14.3	12.8	11.3	129.5	26.5	23.1	21.9	19.6	17.3
107.0	17.5	15.2	14.5	12.9	11.4	130.0	26.8	23.3	22.1	19.7	17.4
107.5	17.7	15.4	14.6	13.0	11.5						

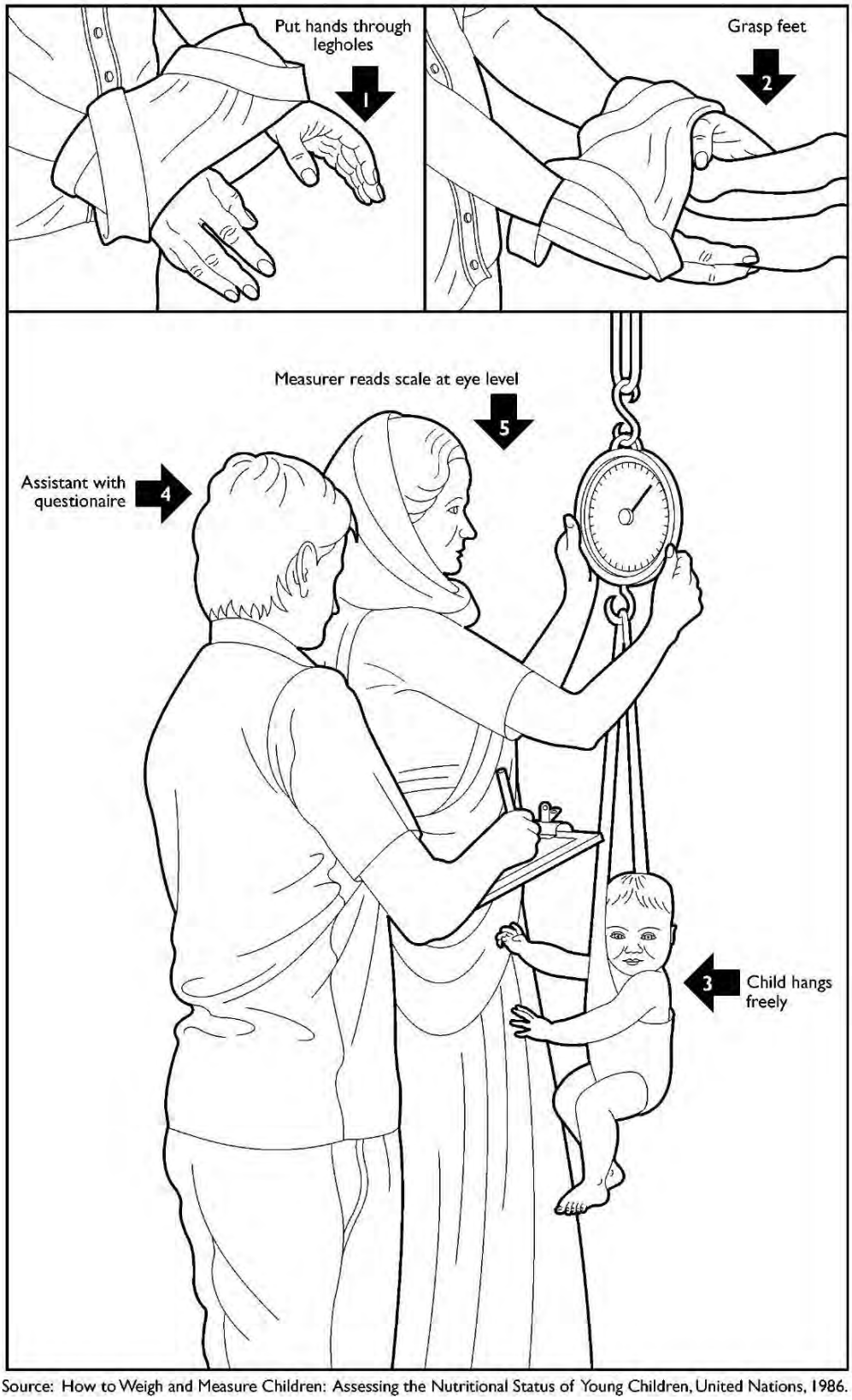
Source: NCHS, CDC, WHO Reference Table 1982)

Height assessment in standing position



Source: How to Weigh and Measure Children: Assessing the Nutritional Status of Young Children, United Nations, 1986.

Weight assessment in children



Source: How to Weigh and Measure Children: Assessing the Nutritional Status of Young Children, United Nations, 1986.

APPENDIX D:

TIME SCHEDULE

Research process/ activities	2010					2011				
	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	April	May
Literature Review										
Proposal Writing										
Prepare data collection tools										
Ethical Approval										
Field Work Data Collection										
Data Analysis										
Report Writing and submission of paper										

APPENDIX E:

BUDGET

Serial Number	**Descriptions**	**Expenses (Baht)**
1.	Printing Questionnaire and document	4,000
2.	Local Transportation	6,000
3.	Assistance Researcher	8,000
4.	Stationary	2,000
5.	Other (back up)	4,000
Total		**24,000**

VITAE

Full name: Nita Sedhain

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Email: nita_self@hotmail.com

Nationality: Nepali

Gender: Female

Date of Birth: July 16th 1986

Marital status: Single

EDUCATION:

June 2010 to date: Graduate student at College of Public Health Sciences, Chulalongkorn University, Bangkok, Thailand.

2006-2009: Purvanchal University, Hope International College, Nepal : Bachelor of Public Health

2002-2005: Shradha Nursing Campus, Nepal : Certificate Level of Nursing

TRAINING:

Pandemic Influenza prevention for the health workers from Red Cross society, Nepal.

Training on diarrheal diseases control

EMPLOYMENT HISTORY:

November 2009 – February 2010: Public Health Instructor

January 2005 – May 2006: Community Health Nurse in B&B Hospital, Nepal