

**PREVALENCE OF CHILDHOOD MALNUTRITION AMONG UNDER 5 YRS
CHILDREN IN REGAE VILLAGE IN GREATER MARBLE HALL SUB-
DISTRICT IN LIMPOPO PROVINCE**

by

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RESEARCH DISSERTATION

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DECLARATION

I declare that **PREVALENCE OF CHILD MALNUTRITION AMONG UNDER 5 YRS CHILDREN IN REGAE VILLAGE IN GREATER MARBLE HALL SUB-DISTRICT IN LIMPOPO PROVINCE** hereby submitted to the University of Limpopo, for the degree of **Master of Public Health** has not previously been submitted by me for a degree at this or any other university; that it is my own work in design and in execution, and that all material contained herein has been duly acknowledged.

.....
MJ MADITSI (MR)

.....
Date

Student Number: 200309272

Dedication

This work is dedicated the following persons:

My wife, **Matšhego**, thank you sweetheart for affording me the space and time to engage in this task, **Puudi á Notlo**;

My late friend **Ramagakishe Mabotha**, your sharp mind has been an inspiration, Mogóla !!!!!!!!!!!!!!!

My son **Makgoleng**, you never gave me a dull moments,

May the grace of the Highest Supreme be with us today and forever!!!!!!!!!!!!!!!!!!!!!!

Summary

PREVALENCE OF CHILD MALNUTRITION AMONG UNDER 5 YRS CHILDREN IN REGAE VILLAGE IN GREATER MARBLE HALL SUB- DISTRICT IN LIMPOPO PROVINCE.

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Childhood malnutrition is one of the conditions that have been identified by the world health organisation to be given high priority in terms of their control and management. This study aimed to determine the prevalence of childhood malnutrition in a rural village of Regae in the Limpopo province. The study found that stunting and underweight are 17.5% whilst wasting is at 12.9% in the village.

Key words: childhood malnutrition, stunting, wasting, underweight, socioeconomic factors, educational level.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND AND OVERVIEW

The World Health Organisation has (WHO) identified a number of health problems that need special attention, and those health problems needed to be under control in the year 2000 (Beaglehole et al, 1993). Childhood malnutrition is one of those health problems that have been identified by the World Health Organisation to be given high priority in terms of its management and control. The United Nations has also adopted the Millennium Development goals that seek to halve childhood malnutrition indicators by 2015 (Alderman et al, 2005). However, malnutrition is still contributing significantly to the death and burden of disease of children in many parts of the world (Caulfield et al. 2004), especially in Africa way beyond the year 2000.

It is stated that under-nutrition still afflicts many people, especially the young and their mothers, in the developing world [Fernandes et al, 2002; Steyn and Walker, 2000]. And further that "... childhood under-weight is the leading cause of global burden of disease"(Caulfield et al, 2005).

The plague of poverty in the developing countries exacerbates the prevalence of malnutrition, more especially childhood malnutrition.

The magnitude of childhood malnutrition in communities is indicated by the prevalence of weight-for-height deficiency (wasting), weight-for-age deficiency (underweight) and height-for-age deficiency (stunting). Wasting indicates acute food shortage whilst stunting indicates a long standing food deprivation (Cosminsky et al, 1993; Fernandez et al, 2002; de Onis et al, 2000; and Zere & McIntyre, 2003). A body of information that deals with the extent of malnutrition in the world exist (de Onis et al, 2000; Kapil & Sethi, 2004; Kurup & Khandekar, 2004).

And furthermore, note was taken of the body of research on the topic of childhood malnutrition that is available with respect to the African continent in particular (Steyn et al, 2005; Ashworth et al, 2004; Kwena et al, 2003; Ngare and Muttanga, 1999; Kikafunda et al, 1998). That notwithstanding, current research evidence on information for the Sekhukhune district in Limpopo province; and Greater Marble Hall local municipality in particular, that addresses the topic of childhood malnutrition is scarce.

The factors that predispose children to malnutrition are complex and varied. They range from political instability, social and cultural practices, slow economic growth due to infectious diseases (de Onis et al, 2000).

The effort to prevent and control childhood malnutrition would therefore need to be multifaceted and comprehensive. The basic features of such measures will include a comprehensive policy framework on mother and child health that ensures an optimal nutrition programme and regular monitoring of the growth of young children (ANC (a); May 1994). This study contributes to the envisaged information gathering mechanism for ensuring that rational planning and effective decision-making are entrenched within the health system in the province.

1.2 RESEARCH PROBLEM

Communities in rural areas are prone to high levels of unemployment and low or no economic growth, and so is the Regae village in the Greater Marble Hall local municipality. The Greater Marble Hall is a sub-district of Sekhukhune district which was declared a nodal zone by the government in 1999. Low growth leads to low household income and increased poverty (van Aard, 1994). Poverty in communities will in turn precipitate high rates of child malnutrition as indicated by height-for-age deficiency [stunting] and weight-for-age [underweight] deficiency respectively. Height-for-age and weight-for-age are used generally as indicators for childhood malnutrition (Wagstaff & Watanabe, 2000; Zere & McIntyre, 2003). Another aspect contributing to childhood malnutrition is the social practices in child feeding. The period of breastfeeding and the food supplements introduced to children under 5 years have effect in the development of malnutrition.

However, the reported number of children in the sub-district not gaining weight and underweight for age was 157 and 377 out of 26 457 for the calendar year 2004 respectively (DHIS report, 2005). This implies that only about 1.4% of children under 5 years were underweight for age in the sub-district. This seems to contradict the assertion that Greater Marble hall sub-district is relatively poor. That notwithstanding, to address the negative effects that might result from child malnutrition it is of critical importance to determine the extent of the problem in a given community. The current study was initiated to determine the magnitude of the burden of childhood malnutrition in Regae village.

1.3 RESEARCH QUESTION

The study was based on the limited current research on the magnitude of childhood malnutrition in rural areas as in Regae village in Greater Marble Hall health sub-district by addressing the following questions:

- What is the prevalence estimate for malnutrition among children under 5 years of age in Regae village in Greater Marble Hall sub-district?
- What are the factors that predispose children to malnutrition?

1.4 AIM OF THE STUDY

The aim of this study was to determine the magnitude of malnutrition (anthropometric failure) among children under 5 years of age in Regae village in Greater Marble sub-district in the first quarter of 2007.

1.5 OBJECTIVE OF THE STUDY

The objectives of the study were:

- To determine the prevalence estimate of malnutrition among children under-five in Regae village.
- To determine the socio-economic factors and social practices that predisposes children to malnutrition.

1.6 SIGNIFICANCE OF THE STUDY

The obtained prevalence of children with malnutrition in Regae village will aid the Provincial Department of Health to strengthen the nutrition intervention programmes. Furthermore, the local health managers and practitioners will be enabled to motivate for priority and increased funding for the poverty alleviation food supplementation programme.

1.7 DEFINITION OF CONCEPTS

Prevalence: this is defined in the main as the frequency/number of existing cases of a disease or other condition in a given/specified population at a certain time or period (Szklo & Nieto, 2007; Rothman & Greenland, 1998; Beaglehole et al, 1993; Lwanga & Lemeshow, 1991).

Child: Oxford Concise dictionary (1999: 245) defines the child as “...a young human being below the age of full physical development...” For the purpose of the study a child shall refer to a young human being from age 1 month to 60 months resident in the greater Marble Hall sub-district.

Malnutrition: malnutrition is defined as “...the lack of proper nutrition, caused by not having enough food to eat, not eating enough of the right things; or being unable to use the food eaten”(Oxford Concise dictionary, 1999:862). Malnutrition is a health condition resulting from poverty in society. A situation precipitated by a number of factors that include economic, social, health and political dimensions.

For the purpose of the study child malnutrition refers to the inability of children to obtain and maintain the World Health Organisation determined weight and height references for a given age (WHO 1978 reference).

The term malnutrition is used interchangeably with anthropometric failure(s). The presence of child malnutrition is determined by Z- score for height-for-age (stunting), weight-for-age (underweight) and weight-for-height (wasting) 2 standard deviations below the median of the reference group [Alderman et al, 2005; Kwena et al, 2003; Hendricks et al, 2003]. This will constitute the broadly defined condition of child malnutrition. The severity of the anomaly, as may lead to the syndromes of kwashiorkor and marasmas, will not be dealt with separately in this study.

Greater Marble Hall Sub-district: is one of the five sub-districts of Sekhukhune district in Limpopo province South Africa. The sub-district covers the Greater Marble Hall local municipality in its entirety.

Anthropometry: is defined as “... the scientific study of the measurement and proportions of the human body” (Concise Oxford dictionary, 1999: 56). The world health organisation views anthropometry as “... the single most universally applicable, inexpensive and non-invasive technique for assessing the size, proportions and composition of the human body” (WHO Technical Report, 1995:p1). For the purpose of the study the anthropometric indices used to determine childhood malnutrition are height-for-age (stunting), weight-for- age (underweight) and weight-for-height (wasting).

Therefore anthropometric indices equal to z-score below 2 standard deviations of the reference measure are regarded as anthropometric failure.

1.8 LITERATURE REVIEW

The literature survey reveals that a substantial body of research on childhood malnutrition and its manifestations exist. Reports from studies on childhood malnutrition are at the level of world regions, Africa, Asia, the Americas and Europe (de Onis et al, 2000). The studies show that malnutrition is found to be highly concentrated in developing countries of Latin America, Africa and Asia (Fernandez et al, 2002). In the developed countries of Western Europe and North America malnutrition is relatively low or absent. The reports are mainly focused on the macro aspect of the prevalence of child malnutrition, a view that lends support to the international effort to eradicate poverty globally.

At the level of countries there is information on India, Pakistan and Sri Lanka in Asia (Kapil and Sethi, 2004; Khuwaja et al, 2005; Kurup and Khandekar, 2004), Kenya, Uganda, South Africa, and Tanzania in Africa (Cosminsky et al, 1993, Kikafunda et al, 1998; Labadarios et al, 2005; Ngare and Muttanga, 1999; Steyn et al, 2005; Zere and McIntyre, 2003).

The cited works do not exhaust the literature available on the subject and the countries mentioned.

What is common in the cited works though, is that childhood malnutrition is correlated with the status of women, the household income and to a less extent the education level of the care-giver or the mother of the child.

1.9 STUDY OUTLAY

The study is comprised of the following chapters:

- Chapter one is about the general outlay of the study which presents the problem, purpose and objectives of the study. The specific terms inherent to the topic are explained in this chapter.
- Chapter two outlines the literature review conducted in the course of developing the study thesis. The review highlights cogent national and international view on the subject under consideration.
- Chapter three presents the research methodology employed in the study in which the study design, target population, sample and sampling process and the data collection method are discussed
- Chapter four present the study results in the form of descriptive statistics coupled with putative inferential outputs.

- Chapter five discusses the conclusion drawn from the research project together with resultant recommendation. It also highlights the limitations and challenges to the study.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The literature sourced for this project was identified with the aid of:

- The University of South Africa computer-based library searches, which included periodical articles, books and reports;
- The University of Limpopo computer-based library catalogue.
- Internet search engines Google. COM; and websites of health bodies like the National Library of Medicine (Pub Med) etc.

The study investigated the prevalence of childhood malnutrition in Regae village (a rural village) in Sekhukhune District of Limpopo province and the factors that predispose children to malnutrition.

2.2 PERSPECTIVES ON MALNUTRITION

The literature survey revealed that there was a substantial body of research on childhood malnutrition and its manifestations. Reports from the studies on childhood malnutrition are at the level of world regions as delineated by the World Health Organisation (de Onis et al, 2000), and countries.

The reports in respect of the world regions are mainly on the macro aspect of the prevalence of childhood malnutrition. Most report on the country-wide phenomenon of childhood malnutrition served to highlight the economic status of those countries – underdeveloped and ‘developing’. And these reports also reflected on cultural practices of child rearing and socialisation. This view lends support to the international effort to eradicate poverty, a position also espoused in the United Nations millennium developmental goals (Alderman et al, 2005).

At the level of countries there is information on India, Pakistan and Sri Lanka in Asia (Kapil and Sethi, 2004; Khuwaja et al, 2005; Kurup and Khandekar, 2004), Kenya, Uganda, South Africa, and Tanzania in Africa (Cosminsky et al, 1993, Kikafunda et al, 1998; Labadarios et al, 2005; Ngare and Muttanga, 1999; Steyn et al, 2005; Zere and McIntyre, 2003). The cited works do not exhaust the literature available on the subject and the countries mentioned. What is common in the cited works though, is that childhood malnutrition is correlated with the status of women, the household income and to a less extent the education level of the care-giver or the mother of the child.

Müller and Krawinkel (2005) reported that in developing countries the rates of malnutrition are 38% for stunting, 31% for being under weight and 9% for wasting.

The sources consulted for the study has a bias to the South East Asia and East and Southern African– a result borne of the language used in the reports and also the level of development of the countries. Of significance in the literature reviewed was the limited referral to countries in the so-called western world – Europe and North America.

2.2.1 Malnutrition in South East Asia

In the mid 1990s the distribution of malnutrition in Asia was indicated as 41% for stunting, 35% for underweight and 10% for wasting (Müller and Krawinkel, 2005). In a study that used 1998 – 99 National Family Health survey for India, Nandy et al (2005) found that 45.2% of children aged 0 – 3 years were stunted, 47.1% children were underweight and 15.9% were wasted (Nandy et al, 2005). The researchers concluded that these rates were "...consistent with those published by UNISEF" (Nandy et al, 2005: 212).

When the states in India were studied for proportions of malnutrition in terms of the anthropometric measures of height-for-age, weight-for-age and weight-for-height the rates differed. Brennan et al (2004) in a study for the states of Karnataka and Uttar Pradesh found that 37 % and 56% were stunted, 44% and 52% were underweight whilst 20% and 11% were wasted respectively (Brennan et al, 2004).

2.2.2 Malnutrition in Africa

The distribution of malnutrition in Africa among children under five years in 1995 was given as 39% stunted, 28% underweight and 8% wasted (Müller & Krawinkel, 2005). The prevalence of child malnutrition in Africa in respect of the literature review was referenced on from the eastern – Kenya and Uganda, and southern (South Africa, Tanzania and Zimbabwe) regions. In a study of the prevalence of malnutrition in eight provinces in Kenya Ngare and Muttanga (1999) found that stunting is 37%, wasting 6% and underweight 27%. These results differ from those found by Kwena et al. (2003) in Western Kenya where the prevalence of stunting, wasting and being underweight were 30%, 4% and 20% respectively.

In Uganda the prevalence of childhood malnutrition as indicated by stunting, and underweight was 23.8% and 24.1% respectively (Kikafunda et. al 1998). The prevalence in South Africa was reported as 25.4% stunting, 17% underweight and 8.9% wasting (Zere & McIntyre, 2003). Alderman et al (2005) reported that in Tanzania the prevalence of malnutrition was 43% for stunting, 29% for underweight and 6% for wasting in 1999. Notwithstanding intra-country and inter country variability the reports compare well with prevalence rates reported by Müller and Krawinkel.

2.3 FACTORS PREDISPOSING CHILDREN TO MALNUTRITION

In this section we also review the literature in lieu of the factors that predispose children to malnutrition with particular reference to the political dimension, social dimension and environmental in relation to the problem of malnutrition.

2.3.1 POLITICAL DIMENSION IN SOUTH AFRICA

This section focuses on the legislative and policy framework developed in South Africa and how this relates to the problem of malnutrition in general and childhood malnutrition in particular.

2.3.1.1 Legislative and policy framework

The South African state prior to 1994 was characterised by divisions along racial lines. The divisions were state sanctioned in a plethora of legislation and policy documents that presented advantages to the white South Africans. The divisions extended from political franchise, through social interaction to the management and provision of health care, wherein non-whites in general and Africans in particular were allocated fewer health resources. The divisions logically resulted in the fragmentation of health services into fourteen health departments that exacerbated the status quo.

The vociferous protestations by those directly affected by the inadequacies of the fragmented health services precipitated changes in the then existing legislative framework. The Health Act 63 of 1977 sought to address these rising concerns. The Act aimed to rationalise health care services in South Africa. This was followed by the National Policy for Health Act 116 of 1990, which enabled all population groups to access available health care facilities in their vicinities. This implies that it become illegal to refuse people health service on the basis of a designated colour.

The Constitution of the Republic of South Africa Act 200 of 1993 effectively abolished the fragmented health departments by creating one national health department. This formed the essence of the White Paper for the transformation of the Health System in South Africa (Department of Health, 1997). It was further entrenched by the Constitution of the Republic of South African Act 108 of 1996 and the National Health Act 61 of 2003. The constitution, through section 27 (3) placed the right to emergency health services as a human right, to which all citizens are entitled.

In the period prior to 1994 a number of policy documents on the envisaged health system were advanced. Of significance among the many was the National Health Plan for South Africa (NHP) by the African National Congress (ANC (b), 1994).

This document proposed the creation of a single comprehensive, equitable and integrated National Health System based on the Primary Health Care (PHC) philosophy. The PHC "... approach is based upon the notion of equity, allowing all citizens an equal chance to achieve their optimum health status through securing health gain "(Fitzgerald et al, 1997). The NHP also outlines the principal tenets and policy mechanisms on health and the coordination of health services among local, district, provincial and national authorities. The document envisages the district level as the "... linchpin of the new [health] system..."(Fitzgerald et al, 1997; Department of Health, 1997).

The department of health released a blue print document in 1997 to chart the way forward in the way to formalise objectives of the National Health Plan (Department of Health, 1997). Chapter seven of the document deals specifically with issues relating to nutrition.

2.3.2 SOCIAL DIMENSION

In this section focus is put on the social status of families and child rearing practices of individual – as indicated by socio-economic status, educational levels of child minders and general hygiene practices of families.

2.3.2.1 Socio-economic status and malnutrition

Socio-economic status (SES) of individuals correlates positively with choices in occupation that they can attain. Socio-economic status is able to reliably estimate people's life chances, life expectancy and the risk of morbidity and mortality (Frongillo et al, 1997). Societal power allocation and wealth resource allocation are also a function of the socio-economic status.

For the purpose of the study socio-economic status shall be indicated by the level of education of the mother and the household income.

2.3.2.1.1 Level of education and child malnutrition.

The level of education of individuals co-determines the social status of the people. The level of education also determines the level of literacy and numeracy within population. The effect of educational level then relates to the accessibility of available state services. Individuals who have attained higher levels of education are able to access services directly in terms of understanding the messages disseminated by health organisations including the government. They are also informed on diseases and general symptoms that accompany those diseases. They are generally aware of hygiene practices disseminated from the health services in general.

The advantage of this is that information from state and other services providers is received directly without third party intervention (the need for interpretation of messages).

South Africans are generally semi literate. The result of the government policy of separate development (apartheid) prior to 1994 as embodied in the Bantu Education Act of 1953. The rural communities were the highest affected by these measures. A cycle of illiteracy and low social class was perpetuated in the rural areas of the country. Low social class is associated with malnutrition because of the meagre resources that are available to this stratum of society. Children who grow being malnourished will show inclination to reduced work capacity as adults. The pattern of low education attainment and social class is evident in Regae village where only about 72 persons has had any post Matric education in relation to 47% who are not employed (Marble Hall IDP, 2002). The IDP puts illiteracy level at 21.5% of all age groups. This compares with the economically active population not employed in the Limpopo province which is estimated at 46 percent (Zere & McIntyre, 2003).

2.3.2.1.2 Household income/ expenditure and malnutrition.

Income, like education is a co-determinant of socio-economic class. It determines people's health status, illness and general level of care.

However, it is not always easy to measure household income, thus a proxy in the form household expenditure is used (Zere & McIntyre, 2003). In societies where services have largely been commodified, household income is the key to access quality health care services. For the low-income categories in the population, of which blacks in general and the rural population in particular, medical and related services are unaffordable. The household expenditure on food in the low income categories will also be affected, in that less income would be spent on nutritional food in general. This would contribute to what Wagstaff and Watanabe (2000) indicate as the poor suffering from higher rates of malnutrition within countries.

The sparse income that most rural households may generate has a direct relation to the problem of under-nourishment and malnutrition. The problems of under-nourishment are located within the unequal distribution of socio-economic and political resources within nation-states and the global world (Johnston, 1995; Pryer and Crook, 1990; Zere & McIntyre, 2003). This unequal distribution precipitates the levels of poverty that beset the world. In studies that looked at malnutrition and income/expenditure inequalities there are uniform findings that indicate positive correlation. The levels of malnutrition decrease with the increase in the levels of income/expenditure (Alderman et al, 2005; Wagstaff & Watanabe, 2000; Zere & McIntyre, 2003).

The challenge for the state is to unravel the inequities that are there. The government should effect significant readjustments to tackle the problems of unemployment, illiteracy, crime, poverty and internal migration. The RDP (ANC (b), 1994) document serves as but one policy document that has been developed to that effect. The state has developed a social security net to mitigate against poverty by providing food parcels to the poor and pay a social security grant to children up to 15 years.

2.3.2.1.3 Employment and malnutrition

The levels of employment in South Africa are skewed in the pattern aping the availability of resources in general. There is large scale unemployment among the African majority especially in the rural areas and in particular among women. Unemployment begets poverty which then exposes households to the vagaries of poor health status manifesting in malnutrition, more especially for the children.

In the rural areas of South Africa employment is a serious challenge. The level of unemployment in South Africa was shown to be at 33.9 % in 2003 and for Limpopo Province, the level is high at 46% for the economically active population (Zere & McIntyre, 2003). Unemployment has a negative impact on the social development of any society. Some of the social ills that are associated with unemployment are: drug and alcohol abuse, child

neglect, violence against women and children and many others. All these do not augur well for the vulnerable in society especially children and their mothers.

2.3.2.2 Environmental conditions and malnutrition.

The environment in which people live has a bearing on incidence of ill health in general. Children who live in squalor conditions are susceptible to infectious disease like diarrhoea and pneumonia (lower respiratory track infection). The availability of clean water and proper sanitation are very important environmental factors in the incidence of ill health (Pryer & Crook, 1990).

The government has prioritised the provision of clean water and proper sanitation as is reflected in the Integrated Development Plans (IDP) of local government structures.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter looks at the methodological procedures followed in the development and conduct of the study. The study site is described in respect of the population demographics; the concepts of study design, study population and study sample are discussed and elucidated comprehensively. The chapter will also deal with issues of the data collection instrument, validity and reliability, and research ethics.

3.2 THE STUDY SITE

The study was carried out in Regae village. The village is in the Greater Marble Hall sub-district of Sekhukhune district in Limpopo province, South Africa. Regae village is the main village in municipal ward thirteen (13) of the Greater Marble Hall Local municipality – prior to municipal ward reclassification in 2005. The municipal ward also includes Dichoeung and Mbuzini villages. The municipal ward share borders with Lepelle- Nkumpi local municipality in the north, Waterberg district in the west and Makhuduthamaga local municipality in the east.

The municipal ward has a total population of 18 138 persons living in 3 298 households. Of the total number of persons in the ward 13% are children under 5yrs of age. There are 45% males and 55% females constituting the gender distribution of the population (Marble Hall IDP, 2002).

The population breakdown for Regae is 11 000 persons residing in 2 000 households (Marble Hall IDP, 2002). This implies that the average number of persons per household is 5.5, considering the total population and number of households. And using the 13% of the ward population it can be estimated that there are 1 430 children under 5 years of age in Regae village.

The unemployment level in the ward was estimated at 12% in the 2002 IDP report, 50% were unspecified and 33% not economically active (Marble Hall IDP, 2002). Of those employed 98% (n=405) earn between R1 and R3 200 per month. The working people are employed in the main on farms (n=148); - agriculture is the main economic activity in the sub district; and in the public service (n=272). There are those people who derive their income from the state social security system – the social grants. No numbers were available from the IDP office at the time of the study.

The level of literacy in the municipal ward is low with about 2 210 persons having no formal or minimal (some primary) schooling. In Regae village there are three schools, one secondary and two primary schools. There are also two early learning centres in Regae village. This supports the observation that most working individuals are in the non-professional sectors.

The municipal ward has one health facility – a public health clinic that provides twenty four hours (24hr) service – and is situated in Regae village. The clinic refers complicated cases to the nearest district hospital located about 35km south- east of the clinic.

3.3 STUDY DESIGN.

The design suitable for this type of study is a descriptive cross-sectional method (Oleske, 2001; Beaglehole et al, 1993; Bowling, 1997; Long, 1984). The cross-sectional study design is deemed to be appropriate since it measures or estimate the variable attribute of the target population at a particular point in time. The choice for the descriptive cross-sectional design was informed by the aim to determine the proportion or magnitude of child malnutrition in the target population. The unit of analysis for the study is individuals – children under the age of 5 years.

3.4 POPULATION AND SAMPLING

3.4.1 Target population

The target population for the study was children aged between 1 month and 60 months in Regae village. Children who were 61 months or over at the time of the data collection were excluded from the study, this also applied to children born during the month of the study.

3.4.2 Sampling method

The estimated population of children under 5yrs of age in the village was estimated at **1430** for the year 2004 (Marble Hall IDP, 2002). A study sample was calculated using the formula:

$$n_0 = \frac{(t)^2 \times (p)(1-p)}{(d)^2}$$

Where t= value of the selected alpha level (0.05)

n_0 = sample size

(p)= estimate of variance at 0.5

d= acceptable margin of error = 5%.

(Bartlet et. al, 2001; Lwanga et. al, 1991).

The sample was randomly selected from the available household numbers. Each house selected was visited and the family interviewed by use of the questionnaire. In the event that there was no child under 5 years in a selected house, the house next on the list was visited – there was no replacement for selected houses without children under five years.

The sample size given by the formula was 384, however only 194 of the selected participants (mothers/caregivers) consented to the study and was included in the final survey. This represents 13.6 % of the target population.

3.5 DATA COLLECTION

3.5.1 Data collection instrument

The data for the study was collected by use of structured interviews conducted among mothers and children care givers of children under 5 years in Regae village. A questionnaire was used to conduct the interview and the measuring tool was divided into two sections. The first component provides the anthropometric details of the child. The second component details the demographic information of the mother or caregiver.

The division of the questionnaire was informed by the objectives of the study viz,

- ❖ To determine the magnitude of malnutrition in the study site
- ❖ To determine the factors predisposing children to malnutrition.

Table 3.1: Format of the questionnaire/measuring tool.

CONTENT	ITEM ON QUESTIONNAIRE
Details of the child	1.1 to 1.11
Demographic details of the mother/caregiver	2.1 to 2.15

3.5.2 Trial test for the instrument

A trial test for the questionnaire was conducted among mothers who brought children for weight monitoring visits at the Matlala Hospital Gateway clinic. This was to determine the extent to which the questions in the questionnaire address the variables of interest. The exercise produced some shortcomings in the initial questionnaire which were addressed by inserting more specific terminology. This was at the advice of the statistician and a recommendation by the co-supervisor.

3.5.3 Data collection procedure

Data collected in respect of the detail of the child was obtained by recording the date of birth of the child as reflected on the Road To Health Card (RTHC), from which the age of the child was calculated. The weight of the child was measured using conventional weighing scales. The children under 6 months were weighed with their clothes off. Weight measurements were taken to the nearest 0.1 kg in relation to the 2.5 kg measure at birth.

The height of the child was measured using head to heel method. The children who were younger than 12 months were measured in supine position and those older were measured standing against a calibrated height measuring board. The length measurements were taken to the nearest 0.1 cm (Kikafunda, et al. 1998).

The weight, height and age were then processed using the Epi-Info Nutrition 2002 edition to determine the z-values of height-for-age, weight-for-age and weight-for-height using the CDC/WHO 1978 references.

The data collection process was performed over a one month period. A structured interview method was used since the researcher knew the information that was required, and therefore relevant questions were

formulated – see the questionnaire (Bowling, 1997). Closed questions were included in the questionnaire.

In the development of the data collection tool the concepts of validity and reliability were considered. Validity refers to the ability of the instrument to measure what is intended (Long, 1984). This is referred to as the construct validity. The construct validity addressed in respect of the current study was in relation to the weight and height measure in malnutrition – the characteristic of interest. And also at the end of the process we must be able to say that the measured characteristic leads to a valid inference or proposition – referring to conclusion validity. That is to say whether “... the sample results accurately represent the sample members views, characteristics or opinions of interest” (Daly et al, 1997: 20). This relate to the question seeking to establish whether there is a relationship between malnutrition and the host of other variables that are associated with it. The questionnaire was developed to ensure that the answer issue of relationship and also to ensure that standard anthropometrics are applied (CDC/WHO references 1978).

Reliability on the other hand refers to the repeatability or consistency of the results (Bowling, 1997; Daly et al, 1984). This refers to the consistency with which similar results are obtained over time or through use by other investigators. The weight and height measurement tools and methods were based on the recommended ones by the World Health Organisation (WHO).

3.6 DATA ANALYSIS

The statistical methods of analysis employed to analyse the data collected included:

- Descriptive statistics, for example numerical summations, graphs and tables – for purposes of aggregation of collected data and determination of patterns.
- Pearson's Chi-Squared test (χ^2) to determine the statistical significance of the statistical variations observed.
- Logistic Regression analysis to look at the risk factors that predispose children to malnutrition, and
- Other statistics relevant to the study project e.g. odds ratios.

The analysis was performed using the Statistical Package for Social Sciences (SPSS), Epi-Info 2002 and Microsoft Excel statistical software packages.

3.7 ETHICAL CONSIDERATIONS

The process of research is a minefield of ethical and legal issues. Ethical considerations in relation to scientific research are premised on the protection of the right of participants in such research projects.

The researcher undertook to observe all relevant ethical and legal considerations that are applicable to scientific research. The researcher obtained authorisation from the relevant department of government and the related institutions to conduct the study.

Informed Consent: The researcher obtained written consent from the participants in the research – from the mothers or caregivers of the children included in the sample. The mothers or caregivers of selected children were informed of the purpose research and how it will be conducted.

Voluntary participation: The participants were duly informed that their participation in the research survey was purely voluntary. There would not be any punitive measure taken against those who declined to participate and neither was there any reward for participation. The participants were made aware of risks and benefit that may accrue from the study.

Confidentiality: All information obtained in the course of this study shall be treated with utmost confidentiality and shall not be used outside the scope of the study. This is done in compliance with the requirement for confidentiality, which seek to protect the identity of research subject against potential abuse/stigmatisation.

CHAPTER 4

DATA PRESENTATION AND ANALYSIS

4.1 INTRODUCTION

The data presented in this chapter was obtained from a total number of 194 participants in the study – representing about 50.5% response rate. This accounts for the number of entries for the weight, height and age of the children. For every entry of a child's information the accompanying mother or caregiver's particulars were also entered. In the event that in one household there was more than one child in the targeted group the demographic information of the mother or caregiver will be the same.

The age, marital status average, household income and educational level were reconfigured after the data was collected. New categories were introduced and these were used in the analysis of the results.

The statistical software packages of Epi Info, Microsoft Excel and Statistical Package for Social Sciences (SPSS) were used to aggregate and analyse the data presented in this chapter.

The presentation of the data is in line with the aim of the study which was:

- To determine the prevalence estimate of malnutrition among children under-five in Regae village.
- To determine the socio-economic factors and social practices that predisposes children to malnutrition.

The mean age, weight and height for the sample was 17.6 months, 9.7 kg and 75.9 cm respectively. Malnutrition is indicated as a Z-score for height-for-age (stunting), weight-for-age (under-weight) and weight-for-height (wasting) that is 2 standard deviation below that of a World Health Organisation determined weight and height references for a given age (CDC/WHO 1978). The study indicated that 17.5 % (n=34) of the sample were stunted, 17.5 % (n=34) were under-weight and 12.9 % (n=25) were wasted.

4.2 SECTION 1: DETAILS OF THE CHILD.

Table 4.1: Prevalence of stunting, under-weight and wasting among children under 5 years in Regae village (n=194)

		Stunting (HAz)	Under-weight (WAZ)	Wasting (WHZ)
		n=34 (17.5%)	n=34 (17.5%)	n= 25 (12.9%)
Stratification by				
a) Age (in months) (% within Haz, WHz, WHz)	01 - 12	8 (23.5%)	10 (29.4%)	10 (40.0%)
	13 – 24	13 (38.2%)	8 (23.5%)	8 (32.0%)
	25 – 36	7 (20.6%)	10 (29.4%)	3 (12.0%)
	37 - 48	6 (17.7%)	5 (14.7%)	5 (20.0%)
	49 – 60	0 (0%)	1 (2.9%)	0 (0%)
b) Gender (% within HAZ, WHz, WHz)	Males	21 (61.8%)	23 (67.7%)	17 (68.0%)
	Females	13 (38.2%)	11 (32.3%)	8 (32.0%)
c) Breastfeeding (% within HAZ, WHz, WHz)	Yes	8 (23.6%)	10 (29.4%)	11 (44.0%)
	No	26 (76.4%)	24 (70.6%)	14 (66.0%)
Chi-Square Test Asym. Sig (2-sided)		0.046	0.223	0.557
d) Type of solid food introduced				
(% within stunting, under-weight and wasting)	Cereal	9 (26.5%)	6 (18.2%)	6 (21.7%)
	Mabele	12 (35.3%)	9 (27.3)	5 (21.7%)
	Maize meal	13(38.2%)	18 (54.5)	13 (56.5%)
Chi-Square Test Asym. Sig(2sided)		0.82	0.018	0.043

Table 4.1 above presents the rates of stunting, underweight and wasting together with of the risk factors for malnutrition with respect to children attributes– gender, age and child rearing practices in Regae village children aged between 1 month and 60 months.

Item 1.3: AGE IN MONTHS

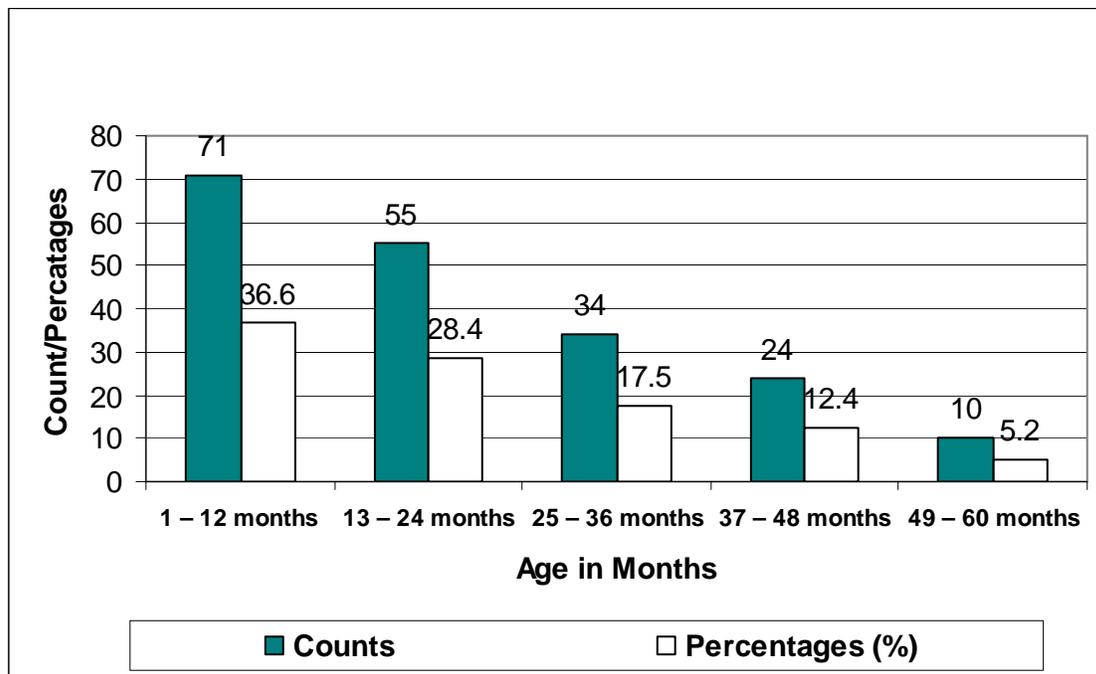


Fig. 4.1 *Graphic representation of age distribution of the children surveyed (n=194.)*

The ages of the subjects ranged from 1 month to 52 months. Most of the children are in the age category one to twelve months 36.6% (n=71)

whereas in the category 49 to 60 months there is only 5.2 % (n=10).

The mean age for the survey sample was 17.6 months. Overall about 65.0 % (n=126) of the subjects were two years of age and younger. This is important to note since this is about maximum time that children are often breastfed.

In table 3.1 above a cross tabulation for age and anthropometric indices of childhood malnutrition is provided. The findings reflect that the prevalence of stunting is highest at 38.2% (n=13) in the 13 – 24 age category and the lowest in the age category 38 – 48 at 17.7% (n=6). There was no observation for the age category 48 – 60 (0).

In respect of under-weight the prevalence is high amongst children in the age category 1 – 12 months and 25 – 36 months at 29.4% (n=10) respectfully. Only one observation was recorded for the age group 49 – 60 months which constitutes 2.9% (n=1) of the under-weight children.

And for the anthropometric failure of wasting the prevalence is high amongst children in the 1 – 12 months at 40% (n=10) and the lowest in the 25 – 36 months at 12% (n=3).

Item: 1.7 GENDER DISTRIBUTIONS.

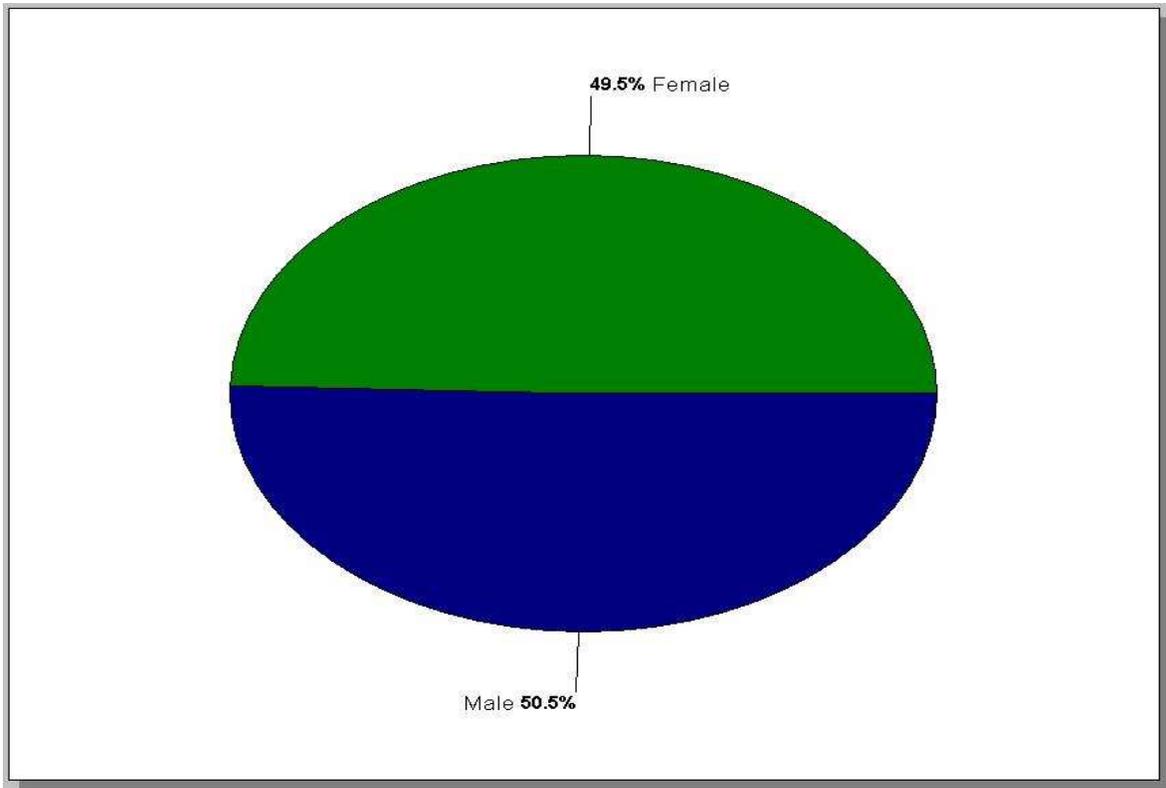


Figure 4.2 *Graphic representation of the gender distribution of the children included in the survey.*

The gender distribution indicates that there were 50.5% (n=98) males surveyed and 49.5% (n=96) females. This is in line with the estimated population distribution by age and sex for the province of Limpopo (Department of Health and Social Development, 2006). The prevalence of malnutrition is found to be more, 61.8% (n=21) stunted, 67.7% (n=23) under-weight and 68.0% (n=17) wasted, in males than in females whose

results are 38.2% (13) stunted, 32.3% (n=11) under-weight and 32.0% (n=8) wasted. The results correspond with those of other studies (Ngare & Muttanga, 1999(Kenya); Zere & McIntyre, 2003(South Africa); Alderman et. al, 2005(Tanzania)).

Item: 1.8. IS THE CHILD BREASTFED?

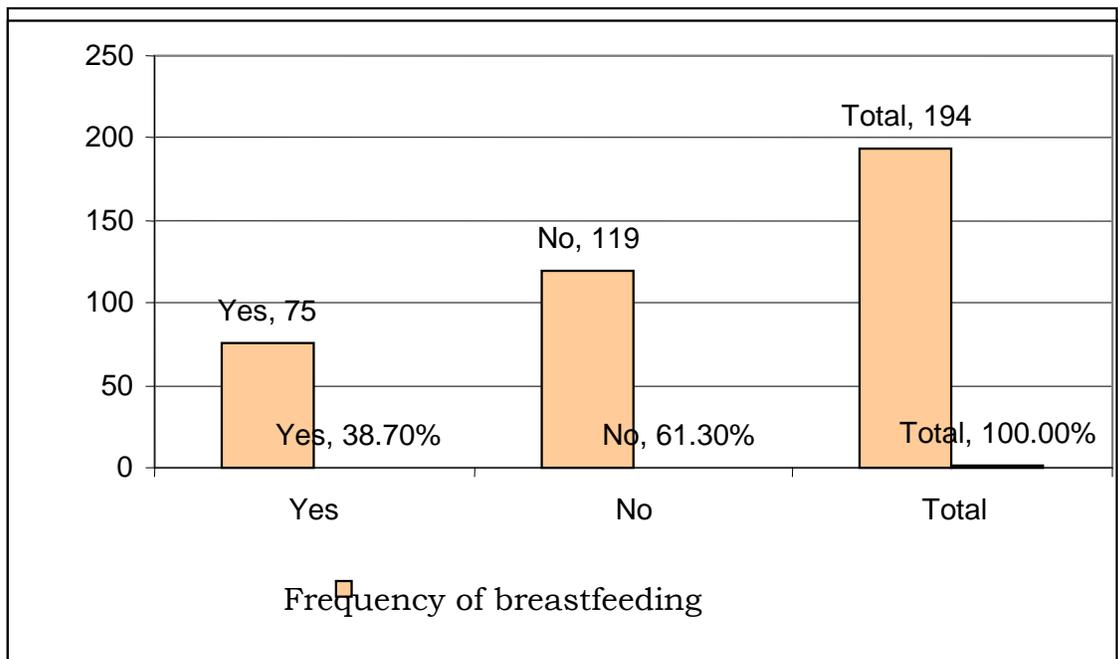


Figure 4.3 *Graphic representation of the breastfeeding distribution among the subjects.*

Among all the subjects 38.7% (n=75) were breastfed and 61.3% (n=119) were not breastfed at the time of the survey. Of the 34(100%) subjects who were stunted, 76.4% (n=26) were not breastfed and 23.5% (n=8) were breastfed.

In relation to under-weight 70.6% (n=24) were not breastfed whilst 29.4% (n=10) of the under-weight children were breastfed. And for wasting the finding is that 66% were not breastfed whilst 44% were breastfed.

The results show no statistical significant association between underweight, wasting and the variable of breastfeeding ($\chi^2 = 1.487$, $p = 0.223$ and $\chi^2 = 0.345$, $p = 0.557$; odds ratio= 0.8) respectively. A statistically significant association is shown for stunting ($\chi^2 = 3.980$, $p = 0.046$; odds ratio= 2.3).

Children that are not breastfed are more likely to suffer stunting than those who are breastfed. Breastfeeding is, however, encouraged in South Africa and the world as it is said to reduce chances of children being afflicted with malnutrition, and because it is the cheapest source of nutrients for growing children.

Item: 1.9 IF NO, THEN INDICATE CHILD FEED.

Of the subjects that were not breastfed at the time of the survey 21.1% (n=26) were fed through the bottle and the remaining 78.9% (n=93) were fed through other means. The study did not look into the effect of concurrent feeding through either bottle or breastfeeding.

The results show no statistical significance in the association between method of feeding for those children not breastfed and the prevalence of malnutrition ($\chi^2 = 0.98$, $p = 20.585$ for stunting and $\chi^2 = 1.675$, $p = 0.196$ for underweight).

Item: 1.10 AT WHAT AGE WAS SOLID FOODS INTRODUCED?

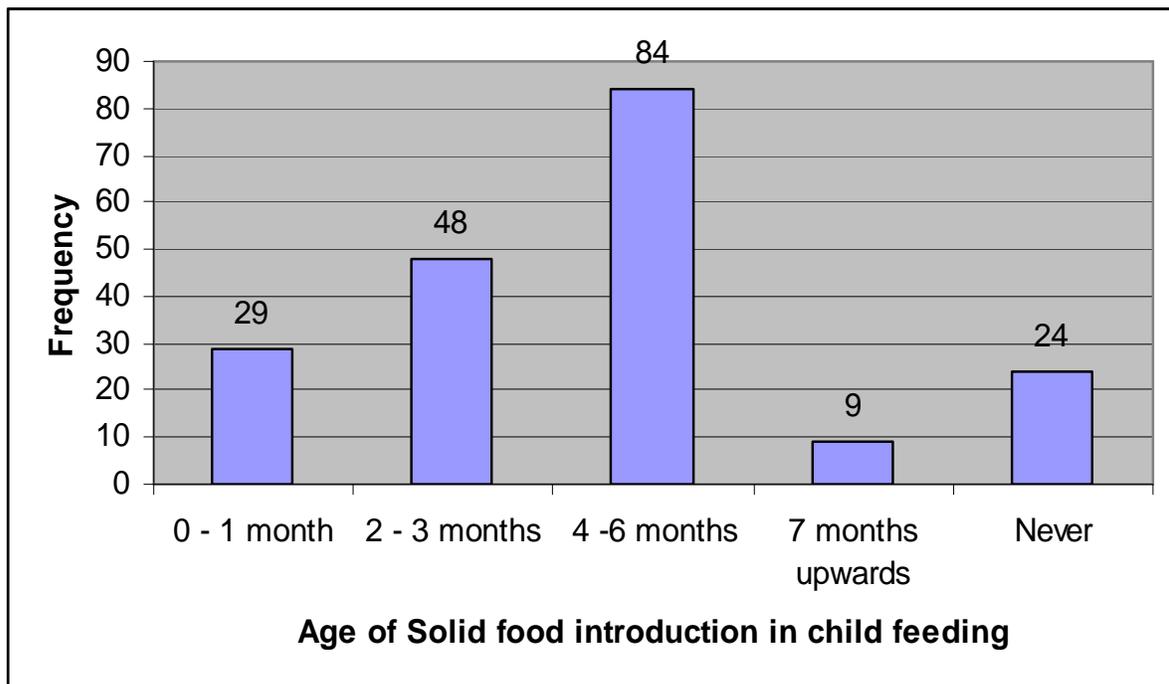


Figure 4.4 *Graphic representation of the age distribution at which solid foods were introduced in child feeding*

Most of the subjects 43.3% (n=84) were introduced to solid foods between 4 and six months, 14.9% (n=29) being introduced to solid foods in their first month whereas 12.4% (n=24) were not yet introduced to solid

feeding at the time of the survey. And due to a number of cells containing less than the required count (5) no Pearson's Chi-square test analysis was done for this variable. However, these observations should not be ignored in view of the context of the promotion of exclusive breastfeeding advocated in the health services.

Item: 1.11 WHAT TYPE OF SOLID FOOD?

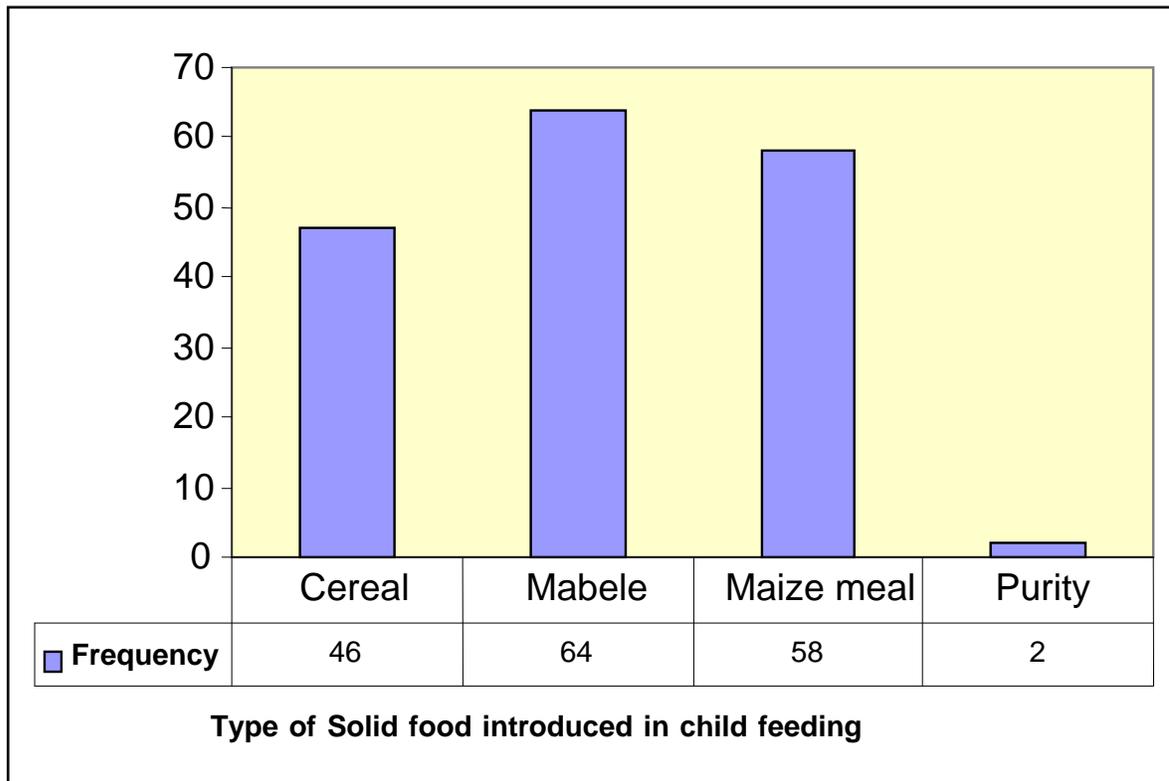


Figure 4.5 *Graphic representation of the type of solid food introduced in the children feeding practice.*

It was indicated in the data presented above that 12.4% (n=24) of the children surveyed were not introduced to solid feeding at the time of the survey. From the total of those who were already introduced to solid feeding (n=170), 27.1% (n=46) were fed cereal, 37.6% (n=64) were fed mabele (sorghum) soft porridge, 34.1% (n=58) were fed maize meal soft porridge and only 1.2% (n=2) were fed on purity.

The prevalence rate of malnutrition in relation to the type of solid feeding introduced was 13.2% (n=13) stunting, 54.5% (n=18) under-weight and 56.6% (n=13) wasting in the maize meal category. Association test (Pearson Chi square test) showed statistical significance in underweight ($\chi^2 = 8.000$, $p = 0.018$) and wasting ($\chi^2 = 6.292$, $p = 0.043$) in relation to the type of solid food introduced to the children. There is no statistically significant association ($\chi^2 = 0.396$, $p = 0.820$) shown between type of solid food introduced and the prevalence of stunting.

4.3 SECTION 2: DEMOGRAPHIC DETAILS OF THE MOTHER/CAREGIVER

Table 4.2: The relations of mothers/caregiver's demographic categories to the malnutrition anthropometric measures.

		<i>Stunted</i>	<i>Under-weight</i>	<i>Wasting</i>
		N= 34	n=34	n=25
a) Mother/Caregiver age groups				
(% within Age group)	17- 24	14 (20.9%)	13 (19.4%)	9 (36%)
	25 – 34	12 (15.0%)	13 (16.3%)	9(36%)
	35 – 66	8 (17.0%)	8 (17.0%)	7(28%)
Chi-Square Test (Asym. Sig 2-sided)		0.642	0.877	0.828
b) Mother/Caregiver marital status				
(% within the marital status category)	Married	9(16.4%)	5(9.1%)	3(5.5%)
	Single	24(18.6%)	26(20.2%)	21(16.3%)
Chi-Square Test Asym. Sig(2sided)		0.717	0.066	0.046
c) Income Categories				
(% within Income Category)	R0 - R399	9 (29.0%)	8(25.8%)	5(16.1%)
	R400 – R599	12 (20.7%)	15(25.9%)	11(19.0%)
	R600 – R999	7 (11.7%)	9(15.0%)	8(13.3%)
	R1000 +	6 (13.3%)	2(4.4%)	1(2.2%)
Chi-Square Test Asym. Sig (2sided)		0.157	0.02	0.08
d) Education Categories				
(% within Education Category)	None + Primary	8(24.2%)	6(18.2%)	6(18.2%)
	Gr 8 – Gr 10	9(13.2%)	18(26.5%)	14(20.6%)
	Gr11 – Tertiary	17(18.3%)	10(10.8%)	5(5.4%)
Chi-Square Test Asym. Sig (2sided)		0.38	0.035	0.011

Item: 2.1 MOTHER /CAREGIVER AGE CATEGORIES

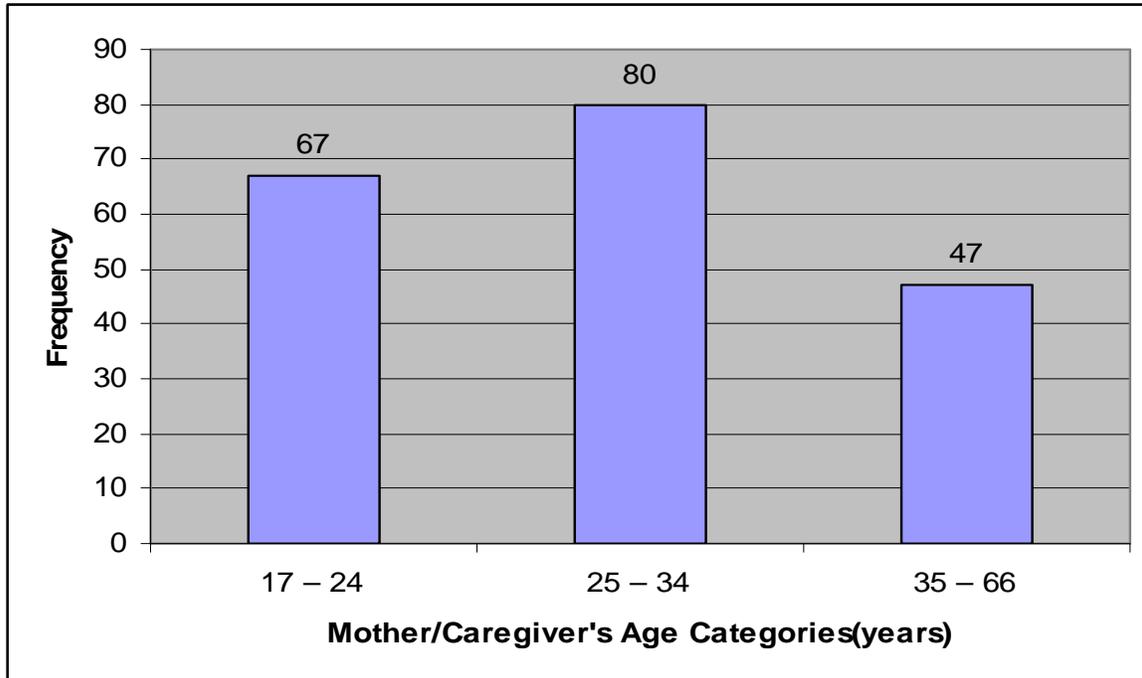


Figure 4.6 *Graphic representations of age categories of children mothers and caregivers.*

The figure above indicates the distribution of the age categories of mothers or caregivers of the children surveyed. The finding is that most of the mothers/caregivers 41.2% (n=80) are in the age category 25 to 34 years and also of note is the relatively high number (n=67) of mothers in the age category 17 - 24 years. Most of the stunted (76.5%; n=26), underweight (76.5%; n=26) children and wasted (72%; n=18) have

mothers in the age categories between 17 yrs and 34yrs. There is, however, no statistically significant association between the age of the mother and the anthropometric measures at 5 % level.

Item: 2.2. WHAT IS YOUR MARITAL STATUS?

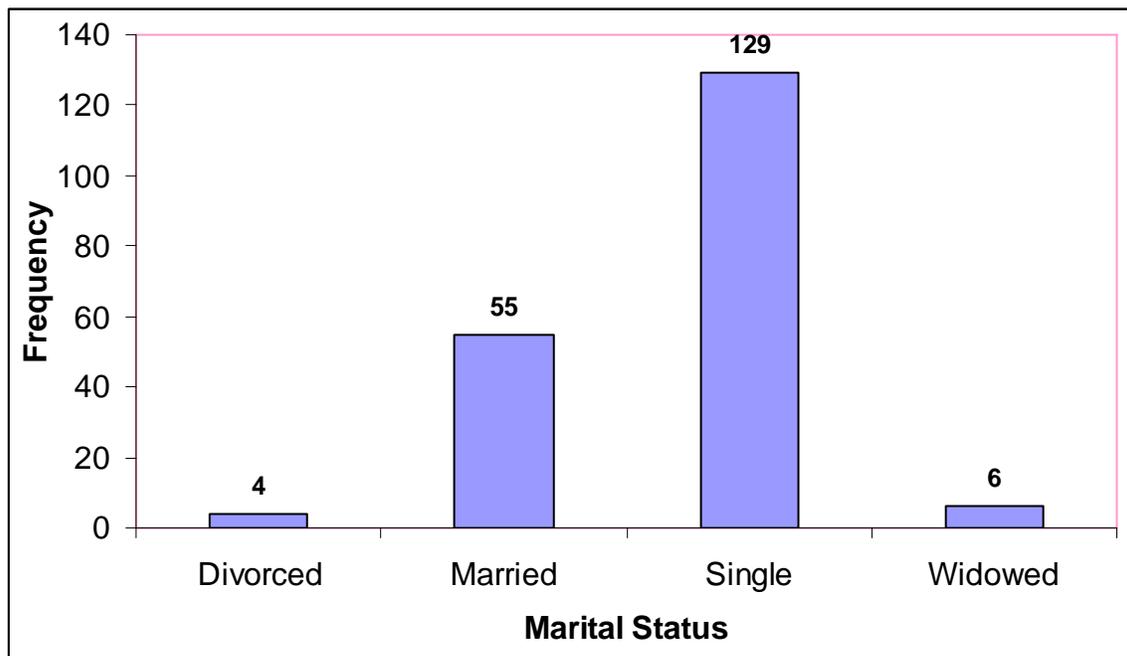


Figure 4.7 *Graphic representation of marital status of mothers/ caregivers.*

This graph indicates that most 66.5% (n=129) of the persons that look after the children be they mother or caregivers in general are single. The findings are that anthropometric failures are high among children of single mothers or caregivers, 18.6% (n=24) against 16.4% (n=9) with respect to stunting, 20.2% (26) against 9.1% (n=5) for underweight and

16.3% (n=21) against 5.5% (n=3) for wasting respectively. There is no statistically significant association between marital status and stunting ($\chi^2 = 0.132$, $p= 0.717$) and underweight ($\chi^2=3.369$, $p= 0.066$), however there was statistical significance observed in relation to marital status and wasting ($\chi^2= 3.983$, $p= 0.046$).

Item: 2.3 INDICATE THE NUMBER OF CHILDREN IN THE AGE GROUP 1 TO 24 MONTHS.

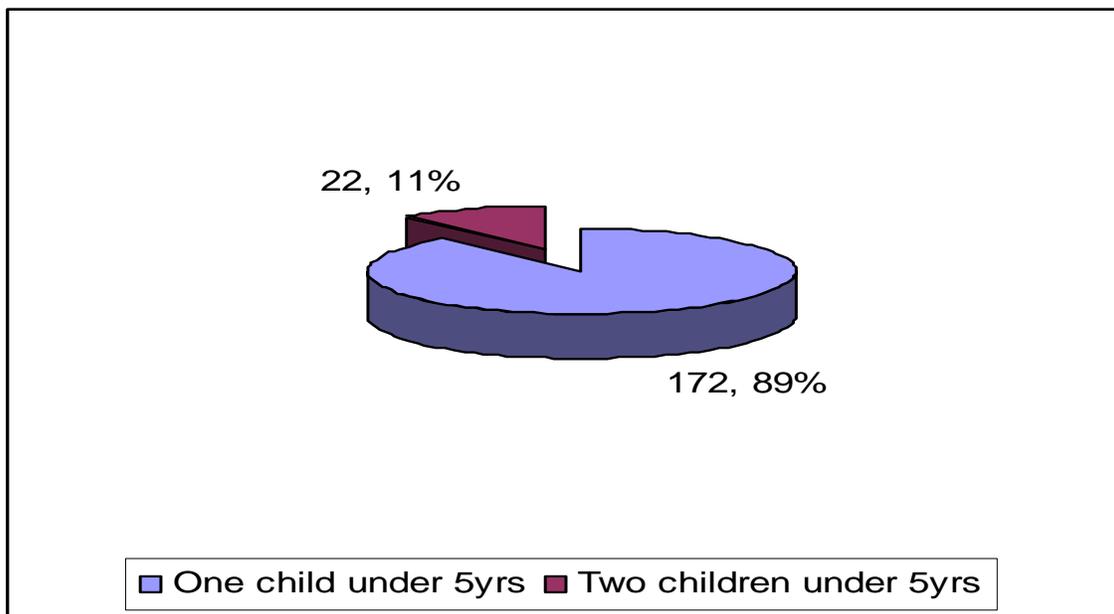


Figure 4. 8 *Graphic representation of the number of sibling under the age of 5yrs per household.*

Figure 4.8 indicates that 89% (172) of the respondents had one child under the age of 5 yrs, and 11% (n=22) had two children under 5 yrs in the family. In respect of anthropometric failures, 88% (n=30) of the stunted, 77% (n=26) underweight and 72% (n=18) of the wasted children have no sibling in the age group 1 month and 24 months respectively (table 4.3 below). The findings indicate in respect of stunting and underweight the number of siblings in the stated age group is not significant, whilst this seems to be a factor for wasting.

Table 4.3: Comparison of number of sibling in age group 1 – 24 months and anthropometric failures.

2.3 Indicate the number of children in the age group 1 to 24 months.	Height-for-Age	Weight-for-Age	Weight-for-Height
One child in age group 1 – 24mths	30	28	18
Two children in age group 1 – 24mths	4	6	7
TOTAL	34	34	25

Item: 2.5 WHERE DO GET YOUR WATER?

Table 4.4: Access to clean water.

Where do get your water?	Frequency	Percent
Communal tap	180	92.8%
Household tap	11	5.7%
River/well	3	1.5%
Total	194	100.0%

Table 4.4 shows that supply of clean water in Regae village is not a problem. The percentage of household with a tap in the yard (communal tap) is 92.8% (n=180), whilst an insignificant 1.5% (n=3) still draws water from the river. Of significance also is the lack of household tap water in the community – only 5.7% (n=55) of the sample had household tap water (water supply connected to the house). This is consistent with economic status of the community.

Item: 2.6 IF NOT FROM HOUSEHOLD TAP, HOW DO YOU STORE YOUR WATER?

Table 4.5: Storage of water in the house.

If not from household tap, how do you store your water?	Frequency	Percent
Bucket with lid/drum	171	93.4%
Bucket without lid	8	4.4%
Other	4	2.2%
Total	183	100.0%

A significantly high number of households 93.4% (n=171) with household tap water in the sample store their water in closed containers. This indicates a high level of hygiene awareness in the target population. However, there is no statistically significant association observed between how water is stored and the levels of anthropometric failures.

Item: 2.7. WHAT IS YOUR SOURCE OF ENERGY?

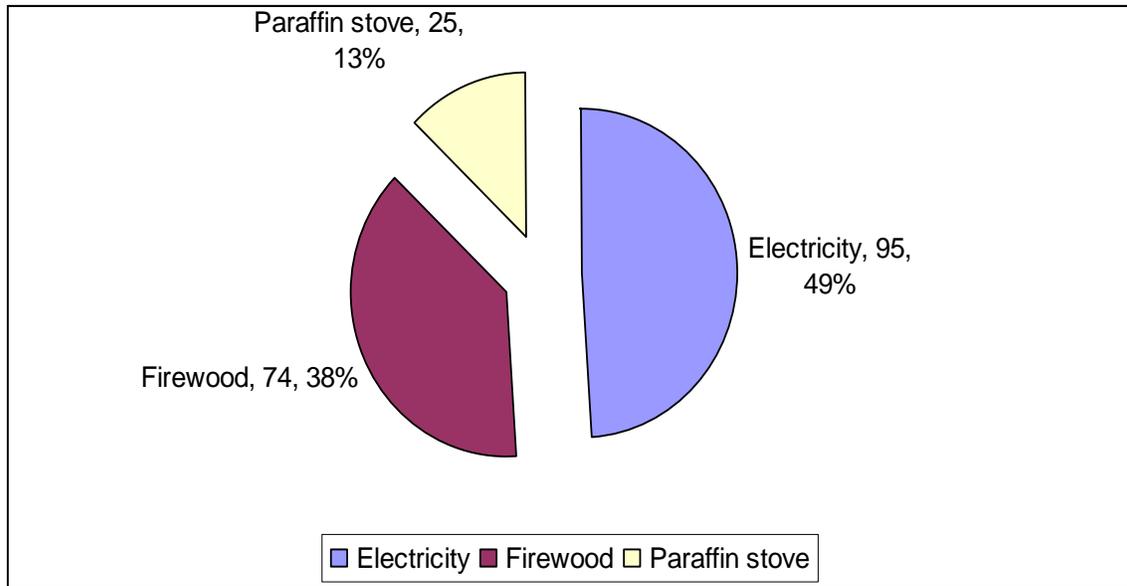


Figure 4. 9 *Graphic representation of the energy source in the families.*

Almost half (49%, n=95) of the survey sample lived in households that had electricity as the energy source. The IDP report indicates that Regae village has about 70 sites that are not electrified. This is a rather unexpected result since the economic status suggests that this is a relatively poorer community – 33% not economically active and majority of working people earning between R1 and R3 200 per month. There is also a significant number of household that still use firewood for cooking purposes although their sites are electrified. No statistically significant association is drawn between the anthropometric failure and source of energy for the households.

Item: 2.8. INDICATE AVERAGE HOUSEHOLD INCOME.

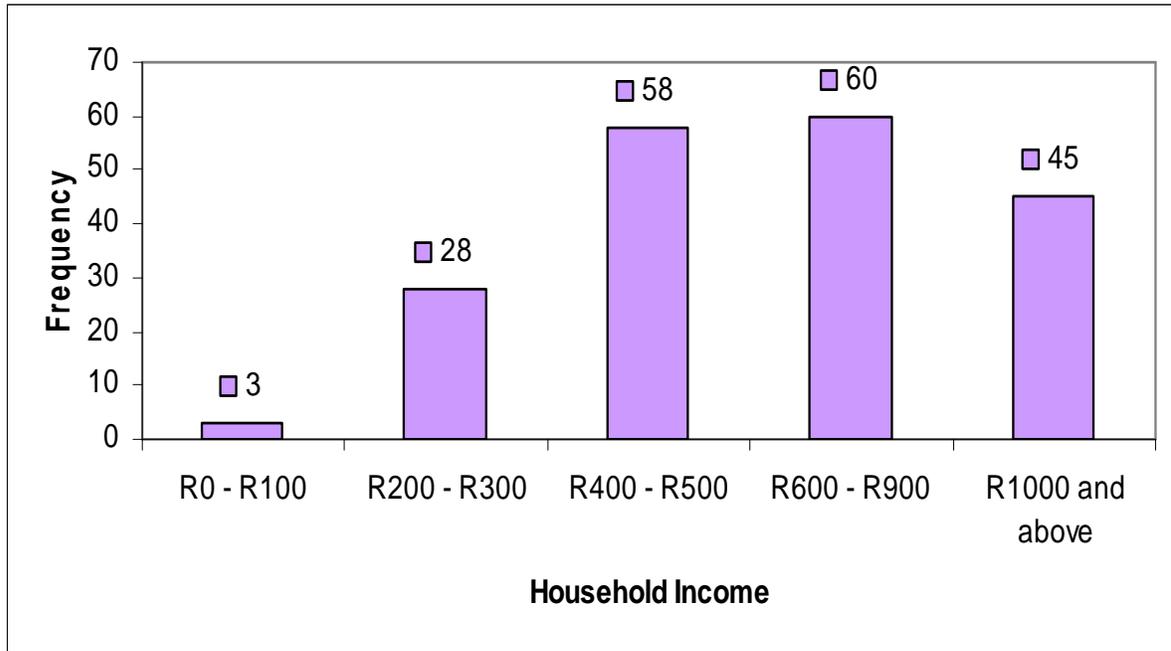


Figure: 4.10 *Graphic representation of household income among the subjects surveyed.*

Figure 4.10 above indicates that the average household income in the sample is highest at between R400 and R999 per month with 60.8%. A very low percentage (1.5%) earn in the category R0 – R199 per month. These results appear to confirm the IDP report in respect of income earnings. This is a significant finding in relation to the prevalence of childhood malnutrition. Low household income has been associated with malnutrition.

However, the study showed no statistically significant association between household income and stunting ($\chi^2=5.213$, $p=0.157$) and wasting ($\chi^2=6.769$, $p=0.080$) respectively. A statistically significant association was only observed for underweight ($\chi^2=9.851$, $p=0.020$).

Item: 2.9 ARE YOU EMPLOYED?

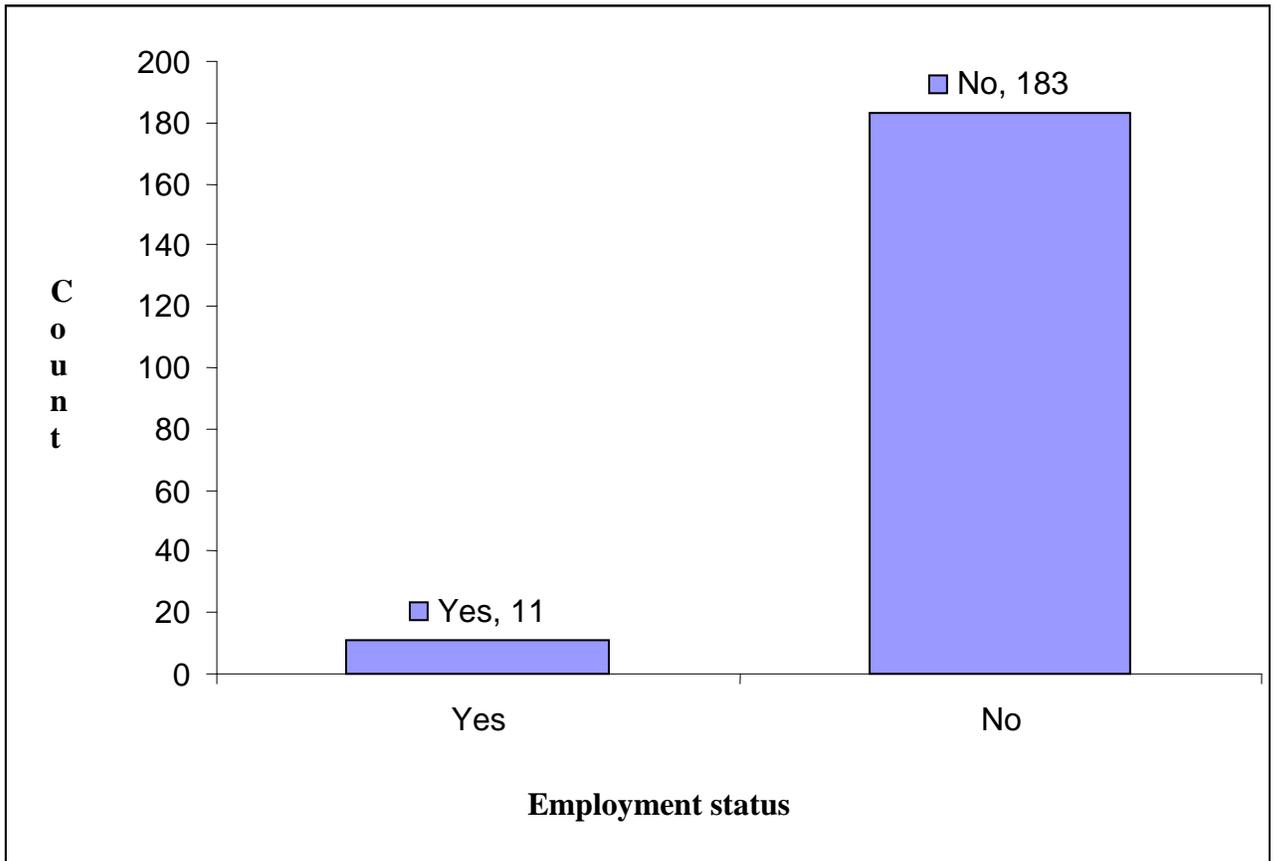


Figure: 4.11 *Graphic representation of employment status of the mothers/caregivers of subjects.*

The level of unemployment among the mothers and caregivers in the study population stood at 94.3% (n=183). This is consistent with the employment status figures from the IDP report for the year 2002. The employment status results corroborate the assertion made in the problem statement that rural areas are susceptible to high levels of unemployment. And therefore substantial levels of malnutrition prevalence will be expected. However, compared to other studies the prevalence of anthropometric failures in this community is not very high.

Table 4.6 below shows that almost all the children with anthropometric failure have unemployed mothers or caregivers. The findings are consistent with the IDP report in respect of the employment status and the average household income observed in the table below.

Table4.6: The comparison of unemployment status and anthropometric failure.

2.9 Are you employed?	Height-for-Age	Weight-for-Age-	Weight-for-Height
Yes	0	1	1
No	34	33	24
TOTAL	34	34	25

Item: 2.10 IF NO, INDICATE SOURCE OF INCOME

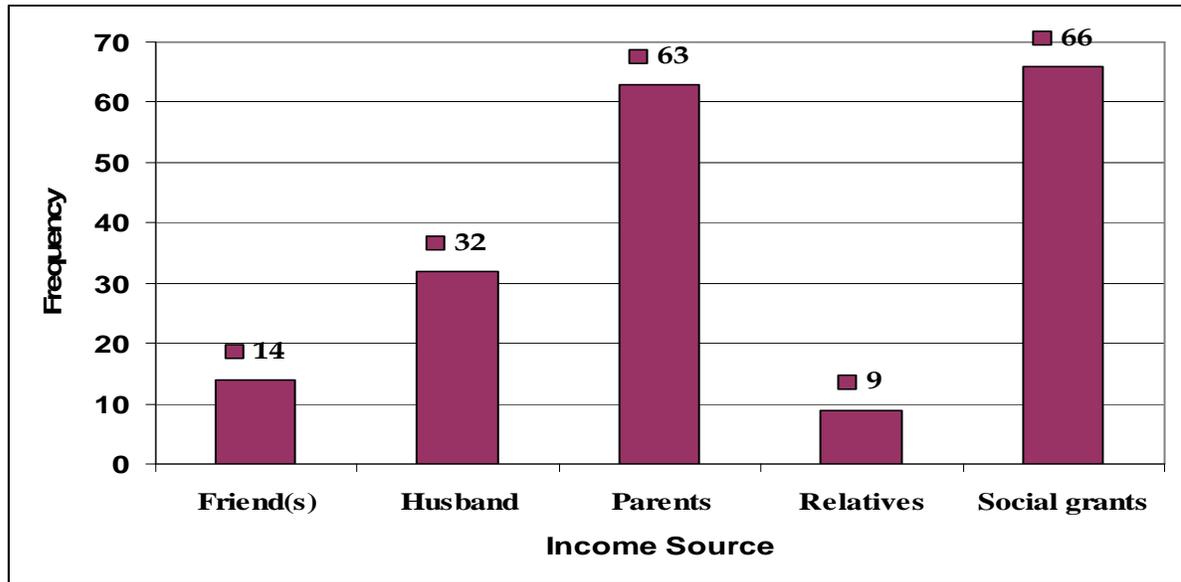


Figure: 4.12 Graphic representation of source of income mothers/ caregivers.

A great number of the mothers and caregivers obtain their income from either the parents – 34.2% (n=63) and the government social grants – 35.9% (n=66). The types of social grants accessed by the population include child support grant and old age pension. This corroborate with the unemployment levels referred to above. There is 7.7 % (n=14) who indicated receiving income from friends which refers to the fathers of the children for the single mothers.

Item: 2.11 DO YOU HAVE YOU OWN ACCOMMODATION?

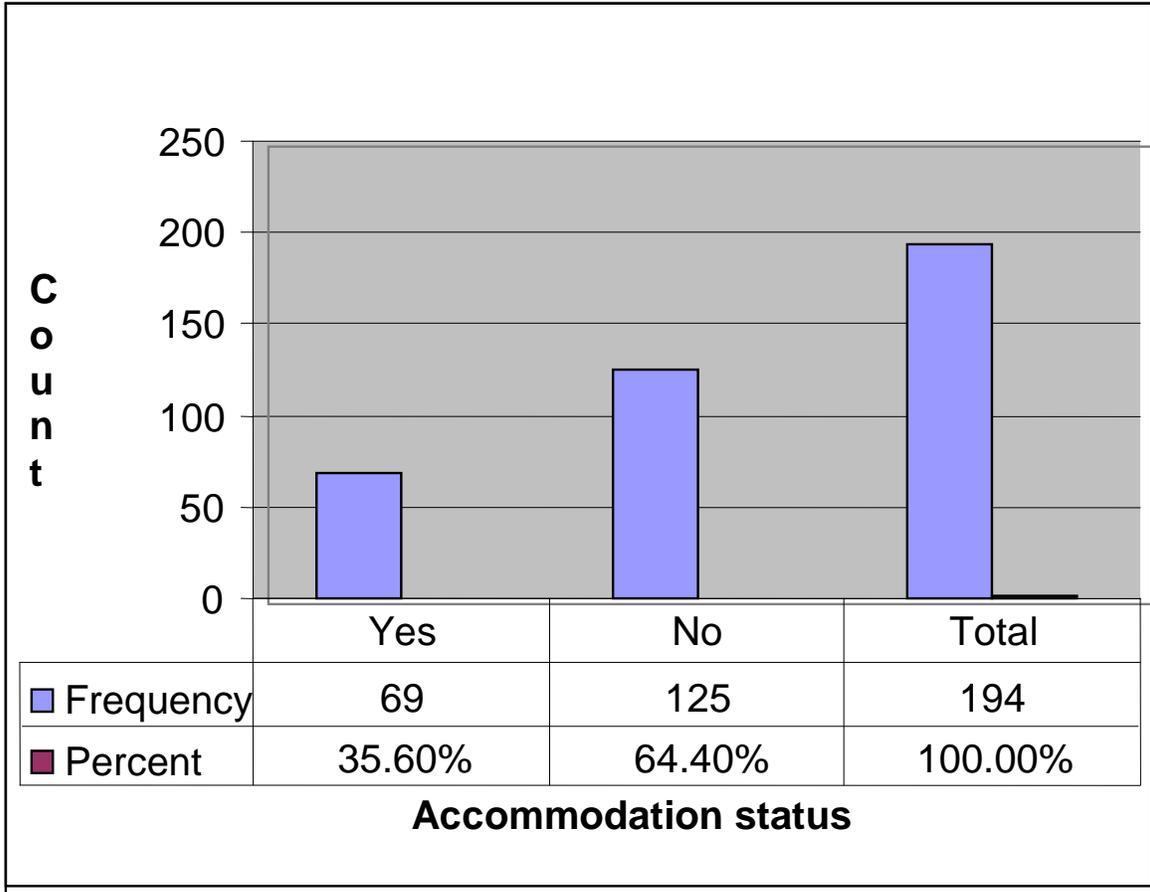


Figure: 4.13 *Graphic representation of ownership of accommodation for the family.*

The graph above indicates that most 64.4% (n=125) of the mothers of surveyed children are not independent as they still live at home, not owning their accommodation.

Ownership of accommodation is a proxy for the level of decision making powers in the life of the mother in general and in relation to childcare in particular. It is assumed that those who do not own their accommodation have less power to determine the proportion of the household income that will be used for food as against other family needs. Pryer and Crook (1999) posits that in peri-urban areas the lack of accommodation is correlated with the anthropometric failures.

Table4.7: Comparison of accommodation ownership and anthropometric failures.

2.11 Do you have your own accommodation?	Height-for-Age	Weight-for-Age	Weight-for-Height
Yes	9	9	6
No	25	25	19
TOTAL	34	34	25

The study found that 73.5% (n=25) of children that are stunted and underweight and 76% (n=19) that are wasted, have mothers who do not own their accommodation respectively.

Item: 2.12 IF NO, WITH WHOM DO YOU LIVE?

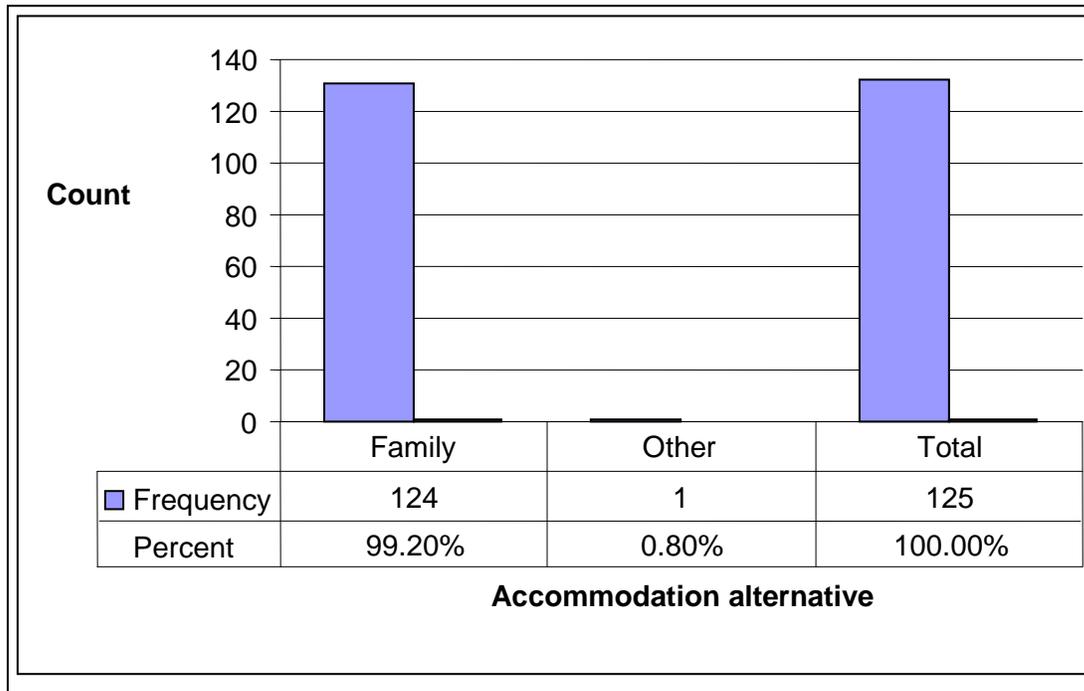


Figure 4.14 Graphic representations of the dwelling arrangements of the subject.

The figure above indicate that 99.2% (n=124) of mothers of the subjects that do not own their accommodation live with family – still live at home. This may have the impact that decisions in respect of child rearing are still exercised by the grandparents of the child.

Item 2.15 HIGHEST EDUCATION LEVEL ATTAINED

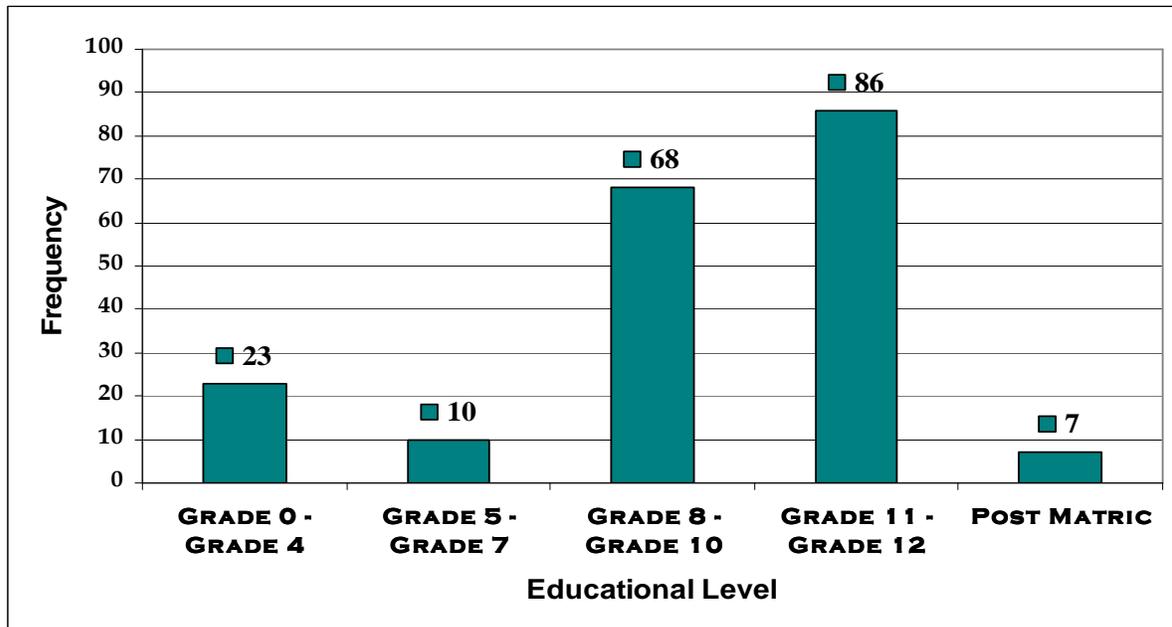


Figure: 4.15 *Graphic representation of the level of formal education attained by the mother/ caregivers of the children surveyed*

The graph above indicate that most (n=154) of the mothers and caregivers have some basic formal education and could be said to be semi- literate. This means that they are able to read and write. However, relating these observations to table 2 produces somewhat unexpected results. Most of the underweight (26.5%) and wasted (20.6%) children have mothers/caregivers in the educational category Grade 8 to grade 10.

The prevalence of malnutrition is found to be high at 24% [n=8]) among children whose mothers or caregivers had no or little education; a position consistent with other studies. There is an association between formal education and anthropometric failure – 52.9% of the children surveyed (n=18; p-value =0.03) are under-weight and 56% (n=14; p-value= 0.01) suffer from wasting. Although there seem to be no association between stunting and education level of the mother/caregiver where the p-value = 0.38 and is greater than the cut-off point of 0.05, the observations are consistent with those for under-weight and wasting. That is to say most stunted children have mothers/caregivers with educational level beyond the elementary level of grade 4.

CHAPTER 5

CONCLUSIONS, LIMITATIONS AND RECOMMENDECTIONS

5.1 INTRODUCTION

This chapter look at the conclusions that can be drawn from data analysis in the study project, discusses the limitations that were experienced in the execution of the project and forward recommendation.

Childhood malnutrition is a disease phenomenon that present serious burden on the development of children. It is indicated in many a study that undernourished children present with deficiencies as adults. Their ability to perform optimally would have been compromised by the experience of nutritional deficiency. To be able to prevent and manage the incidence of childhood malnutrition it becomes imperative to measure the magnitude of the occurrence of the disease and also look at factors that contribute to its development.

A quantitative descriptive cross-sectional survey was conducted using a structured questionnaire and a measuring tool that was administered by the researcher to address the objectives of the study.

The objectives of the study were:

- To determine the prevalence estimate of malnutrition among children under-five years Regae village.
- To determine the socio-economic factors that predisposes children to malnutrition.

5.2 CONCLUSIONS

The conclusions are presented based on the literature review, research methodology and the empirical research. The research methodology looked at the study design and the questionnaire sections of the data collection tools as outlined in chapter 3 – section 1 which deals with the details of the child and section 2 that provided the demographic information of the mother or caregiver.

5.2.1 Conclusion based on literature review.

The literature review reflected how malnutrition is studied in the world and further indicated the association between malnutrition and the level of socio-economic development of countries. A country with low level of socio-economic development will present a higher risk for children to experience malnutrition. The literature review also showed that developing countries in South-East Asia and Africa have significantly high prevalence of childhood malnutrition.

5.2.2 Conclusions based on research methodology

A quantitative descriptive cross-sectional survey was conducted using a structured questionnaire and measurement tool administered by the researcher to address the objectives of the study. The study design was chosen as it enabled the researcher to estimate the magnitude of child malnutrition at the time of the survey. A cross-sectional study records the exposure variables and the outcome variables at the time of the survey.

5.2.3 Conclusion based on the empirical research.

This section presents a summary discussion of the research results in terms of the section of the questionnaire which reflect the magnitude and risk factors for malnutrition.

5.2.3.1 Details of the child (Items 1.3 to 1.11)

- **The ages of the children**

The age of a child is a very important measure in the computation and interpretation of anthropometric indices (WHO Tec Report, 1995). The anthropometric indices of height-for-age (stunting) and weight-for-age (underweight) are highly dependent on the accuracy of the age of the child as this are compared to the age of the reference group. The study found that the prevalence of anthropometric failures differs according to age categories. Stunting prevalence was high (38.2%; n=13) among children in the age category 12 to 24 months. The findings of the study are comparable with those of the country as presented by Steyn et al. (2005). This is consistent with the definition of stunting which is to

indicate long term deprivation of adequate food. Underweight and wasting are most prevalent in the age category 1 to 12 months.

- **Gender of the children**

The gender of children most afflicted by malnutrition is a significant variable in the study. It is posited that in some communities child care in general has a gender bias with male children favoured over female children. The expected results would therefore indicate higher prevalence of anthropometric failure among female than male children. The study has however found the opposite. In respect of the anthropometric indices used male children showed higher prevalence of childhood malnutrition than female children.

- **Breastfeeding practice**

The practice of breastfeeding is encouraged for all mothers, especially in the first four to six months of life. The only exception to this practice is in the case of HIV positive mothers, in which case choice between formula feeding and breastfeeding is exercised.

In the main however breastfeeding is still encouraged. The study found that only 38% of the children were breastfed at the time of the survey and stratified by age the study found that breastfeeding was practiced in the main for children between ages 1 and 15 months. A statistically significant association was observed for stunting and not with the other anthropometric indices. The findings do not compare with other studies (Brennan, 2003) which found no evidence of association between stunting and breastfeeding.

- **Introduction and types of solid foods.**

The introduction of solid food is said to have effect on the development of children and this reflect in the anthropometric indices (Brennan et al, 2004). The study found that occurrence of introduction of solid food for children is in the age category 4 to 6 months and this is consistent with other studies (Cosminsky et al, 1993).

The study could however not yield conclusive results on the impact of this variable on the prevalence of childhood malnutrition.

This is attributed to the size of the sample since there were not sufficient data to compute association analysis.

A related aspect of introduction of solid food is the type of food introduced. The conventional wisdom in clinical health is that there is no significant difference in the type of solid food and the prevalence of childhood malnutrition. This is confirmed in the study in respect of stunting. However, insofar as underweight and wasting are concerned the assertion is not confirmed. Most of the wasted and underweight cases were found to have been introduced to maize meal soft porridge. Cosminsky et al. (1993) noted this phenomenon and wrote that "[mothers] seem unaware and not informed that refined maize meal is less nutritious ..." (Cosminsky et al, 1993: 946).

5.2.3.2 Demographic detail of the mother or caregiver

- **Age and marital status of the mother/caregiver**

The age of the mother correlates with the observation of anthropometric failures. Younger mother (those in the age category 17 – 24 yrs) would in the main have children who exhibit anthropometric failures.

The study however does not affirm this assertion. It found no statistically significant association between anthropometric failures with the age of the mother. This could be attributed to a number of other factors which would need to be studied in detail.

- **Age difference between siblings**

The number of children under the age of two (24months) in a household, especially if they are of the same mother is assumed have impact on proper child care. The study is not conclusive in respect of this assertion, a position attributable to the low number of subjects.

- **Access to clean water and storage (hygiene consciousness)**

The environment in which people live has a bearing on incidence of ill health in general. Children who live in squalor conditions are susceptible to infectious disease like diarrhoea and pneumonia (lower respiratory track infection). The availability of clean water and proper sanitation are very important environmental factors in the incidence of ill health.

A significantly high number of households, 93.4% (n=171), who do not have tapped water in the surveyed population store their water in closed containers. However, there is no statistically significant association observed between how water is stored and the levels of anthropometric failures.

- **Employment and income status**

Unemployment is one of the biggest socio-economic problems that threaten underdeveloped societies. Unemployment presents the issue of compromised household income. This may in turn lead to actions by the mothers or caregivers that may ultimately seriously put the household in danger. The instances referred to include substance abuse, prostitution and even child abandonment. All these do not augur well for the provision of adequate food with the requisite nutritional value.

The research has found that most of the mothers or caregivers are unemployed – (n=183). This has created a high level of dependency in the young mothers. Most of them are dependent on the state social grants and their parents as source of income.

Although the social security net is important in the fight against poverty it cannot substitute the need for employment by the communities. For one, the child grant is available to children up to the age of 15 years.

The study shows that stunting afflicted children whose mothers or caregivers are unemployed (n=34). Furthermore underweight and wasting prevalence is also highest among children of unemployed mothers or caregivers.

- **Accommodation of mother and children**

Ownership of accommodation is a proxy for the level of decision-making powers in the life of a mother in general and in relation to childcare in particular. There is an assumption that those who do not own their accommodation have less power to determine the proportion of the household income that will be used for food as against other family needs. Pryer and Crook (1999) argue that in peri-urban areas the lack of accommodation is correlated with the anthropometric failures. The study indicate that 99.2% (n=131) of mothers of the subjects that do not own their accommodation live with family – still live at home.

This may have the impact that decisions in respect of child rearing are still exercised by the grandparents of the child.

The study indicated that most of the mothers of surveyed children, 64.4% (n=125), are not independent as they still do not own their own accommodation. This corresponds with the level of anthropometric failures observed in the study, as there are 73.5% stunted and underweight and 76% wasted children whose mothers do not own their own accommodation. The results also support the assertion made by Pryer and Crook (1990) in respect of peri-urban areas.

- **Educational level of the mother/caregiver**

The level of education of individuals co-determines the social status of the people. The effect of educational level will then relate to the accessibility of available state services insofar as published documentations are concerned. Individuals who have attained higher levels of education are able to access services directly. They are also informed on disease and general symptoms that accompany those diseases. They are generally aware of hygiene practices disseminated from the health services in general.

The advantage of this is that information from state services providers is received directly without

third party intervention. The level of education of the mother or care giver shows correlation with the prevalence of malnutrition among children under 5 years of age.

Most South Africans are generally semi literate – their ability to read and write is limited to mother tongue functionality. This was a result of the government policy of separate development (apartheid) embodied in legislations and policies in existence prior to the 1994 democratic elections. Rural communities were the highest affected by these measures. A cycle of illiteracy and low social class was perpetuated in the rural areas of the country. Low social class is associated with meagre resource availability which leads to malnutrition to this stratum of society. Children who grow being malnourished will show inclination to reduced work capacity as adults.

The pattern of low education attainment and social class was evident in Regae village where only about 72 persons have had a post matric education in relation to 47% who are not employed (Marble Hall IDP,

2002). This is consistent with the findings of the study. Mothers with a post matric qualification were few.

The study results highlight something that would need to be investigated thoroughly, that most of the anthropometric failures occur in children whose mothers have relatively high level of education. This contradicts the assertion made in chapter 2 above. A tentative explanation to this apparent aberration is that most of these mothers do not afford their children the necessary parental care. This phenomenon will need to be investigated further to establish a rational explanation.

5.3 LIMITATIONS OF THE STUDY

In the planning and execution of the research project a number of challenges that proscribed it were encountered. The following were the most notable:

- ❖ As an exploratory study the research was limited to a relatively smaller geographic area – the chosen study site. This has the effect

- ❖ that the research problem is not adequately answered, whilst the aim and objective of the study were addressed.

- ❖ There were challenges in obtaining information in respect of the actual population. There were no recent available maps of the area which seriously affected the sample selection and in the end contributed to the availability of the requisite sample size other problems notwithstanding.

5.4 RECOMMENDATIONS

The problem of childhood malnutrition is a very serious impediment on the normal development of children. It is a problem that has multifaceted causative factors and therefore will need a comprehensive approach to manage and control. Government programmes have been instituted to alleviate the plight of the poorer communities.

The following recommendations are made in respect of further strengthening of the fight against childhood malnutrition:

- i. The intensification of the health education programme with respect to the benefit of exclusive breastfeeding in the first six months of the life of the babies.
- ii. The health education drive in respect of childcare and nutrition should be extended to all layers of child care industry.
- iii. A detailed district wide study be undertaken to strengthen the information base on the extent of the problem of malnutrition in general and among children in particular.
- iv. The empowerment of households by improving the socioeconomic conditions in the sub-district through provision of social grants and food parcels; job creating projects and skills development programmes incorporated in the municipal Integrated Development Plan (IDP).

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ANNEXURES

A. Questionnaire

B. Consent Form

C. Letters of request for the research project

Questionnaire

Prevalence of child malnutrition in Regae village

1. Details of the Child

1.1. Identification of the child

1.2. Date of birth

1.3. Age in months

1.4. Height in centimetres

1.5. Birth weight in kilograms (as on the Road To Health Chart)

1.6. Weight in kilograms on the day of survey

1.7. Gender of the child	Male	1	Female	2
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1.8 Is the child breast fed?	Yes	1	No	2
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1.9 If no indicate child feed,	Bottle	1	Other	2
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1.10 At what age were solids introduced?	0 – 1 month	1	
2 – 3 months	2	4 – 6 months	3
7 months upwards	4	Never	5

1.11 What type of solids?	Cereal	1	Mabele	2
	Purity	3	Soft Porridge	4

2. Demographic detail of the mother/caregiver.

2.1 What is your age in years?

2.2	What is your marital status			
	Married	1	Single	2
	Divorced	3	Widowed	4

2.3 Indicate the number of children in the age group 1 to 12 months.

2.4 What is the age difference in months between your two youngest children?

2.5	Where do you get water?			
	Household tap	1	Communal tap	2
	Tank	3	Borehole	4

2.6	If not from household tap, how do store your water?			
	Bucket with lid	1	Bucket without lid	2
	Jug	3	Other	4

2.7	What do you use for cooking?		Electricity	1
	Coal stove	2	Gas stove	3
	Paraffin	4	Other	5

2.8	Indicate average household income	R0-R199	1	
	R200-R399	2	R400-R599	3
	R600-R999	4	R1000 and above	5

2.9	Are you employed?	Yes	1	No	2
2.10	If no, indicate your source of income	Husband	1		
	Parents	2	Relatives	3	
	Friends	4	None	5	

2.11	Do you have your own accommodation?	Yes	1	No	2
------	-------------------------------------	-----	---	----	---

2.12	If no above, with whom do you live?			
	Family	1	Friends	2
	Renting	3	Other	4

2.13	Did you have any complications during pregnancy?	Yes	1	No	2
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2.14	Are there any hereditary conditions in the family?	Yes	1	No	2
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2.15	What is your highest educational level?	No schooling	0	
	Primary school	1	Secondary school	2
	Tertiary (degree/diploma)	3	Post-graduate degree	4

Consent form

I,....., the undersigned hereby declare that the following have been explained to me.

- The research project is for academic purposes only;
- My name and that of my child shall not be included in the research project;
- The condition of my child shall not be divulged in specific terms save for the purpose of the research project;
- My social and economic circumstances shall not be referred to outside the parameter of the study;
- No reward is to be expected from participation in the research project.

I therefore give consent to participate in the research project as explained.

Mother/ Care-giver of participating child:

Name: _____

Signature: _____

Witness: _____

Date: _____

Place: _____

21746 Mamelodi East

P.O. Rethabile

0122

26 October 2006

To Whom It May Concern:

RE: Request to partake in a study.

Sir/Madam

You are hereby requested to be part of the sample in a study that is conducted in your clinic as part of the Greater Marble Hall health sub-district. The study is in part completion of a Master of Public Health (MPH) degree for which I am registered with the University of Limpopo (Formerly UNIN).

The title of the study is: **Prevalence of child malnutrition among children under 5yrs of age Regae village in the Greater Marble Hall sub-district.**

The aim of the study is to measure the prevalence (level) of child malnutrition in the area. The study is not intended to judge individual behaviour or life style. And the results of this study shall not be used for any adverse purpose.

I hereby commit myself to observe relevant ethical and legal issues pertaining to performance of research studies.

I hope that my request will receive your expeditious consideration.

Yours respectfully

Mohlapametse James Maditsi

21746 Mamelodi East

P.O. Rethabile

0122

26 October 2006

The Chairperson

Ethics Committee

Department of Health and Social Development

Limpopo Province

RE: APPLICATION FOR PERMISSION TO CONDUCT A STUDY.

Sir/Madam

I hereby make an application to conduct a study in Regae village in the Greater Marble Hall health sub-district. The study is in part completion of a Master of Public Health (MPH) degree for which I am registered with the University of Limpopo (Formerly UNIN).

The title of the study is: **Prevalence of child malnutrition among under 5yrs old children in Regae village in the Greater Marble Hall sub-district.**

The proposal for the study is attached herewith; and it has been submitted to the university research committee for approval and endorsement.

I hereby commit myself to observe relevant ethical and legal issues pertaining to performance of research studies.

I hope that my application will receive your expeditious consideration.

Yours respectfully

.....

Mohlapametse James Maditsi