# AN ASSESSMENT OF THE PREVALENCE OF DIARRHOEA IN CHILDREN AGED ONE TO FIVE YEARS AND THE FAMILIES' ABILITY TO IMPLEMENT OR SUPPORT ENVIRONMENTAL CONTROL MEASURES THAT REDUCE DIARRHOEA INCIDENCE IN THIS AGE GROUP IN ITALA VILLAGE AND MKUSHI HOUSING ESTATE, MKUSHI DISTRICT, ZAMBIA.

**BY**

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Submitted to the Department of Community Medicine, School of Medicine, University of Zambia, in partial fulfilment of the requirement for the Degree of Master of Public Health.



April, 1998

**[Revised Copy]**

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## DECLARATION

I, ALBERT SHADRECK NGULUWE, hereby declare that the work presented in this study as a requirement in the Master of Public Health Programme has not been presented wholly or in part for any other Master of Public Health Degree and is not being currently submitted for any other degree.

Signed : ..... Date : 26. 7. 99
Candidate

We have read this dissertation and have approved it for examination.

Date : 26-7-99 Signature : .....
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## APPROVAL

This dissertation of ALBERT SHADRECK NGULUWE is approved in partial fulfilment of the degree of Master of Public Health by the University of Zambia.

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| Examiner's Signature : | Date: |
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## STATEMENT

I hereby certify that this study is in all entirety the fruit of my own independent and laborious investigations. The various sources to which Iam indebted are gratefully acknowledged in the references.

Signed : .....

Candidate : Master of Public Health

## DEDICATION

This study is dedicated to my dearest wife Liz Ntoshya and children Shadreck (son), Mpatwa (daughter), Mwengwe (daughter), Mupeshya (son) and Manase (daughter) for their patience and encouragement.

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## ABBREVIATIONS AND STUDY DEFINITIONS

| | |
|---|---|
| A.I.D.S | Acquired immuno- deficiency syndrome |
| A.P.C | Aerobic plate count |
| C.B.o.H | Central Board of Health |
| Convalescent | Person who is recovering from illness |
| D.A.P.P | Development Aid from people to people |
| Dem. Rep. | Democratic Republic |
| D.M.O | District Medical Officer |
| E.Coli | Escherichia Coli |
| F.G.D | Focus group discussion |
| H.H | Harvest Help |
| H.I.V | Human immunodeficiency virus |
| I.E.C | Information, education and communication |
| I.P.D | Inpatient department |
| Incidence | Number of new disease cases occurring in the community in a specific period of time |
| K.A..P | Knowledge, attitude and practice |
| M.C.H | Mother and Child Health |
| M.M.D | Movement for Multiparty Democracy |
| M.o.H | Ministry of Health |
| M.P.N | Most probable number |
| M.S.F | Medicin Sans Frontieres |
| O.R.S | Oral rehydration salt |

O.R.T ..... Oral rehydration therapy

N.G.O ..... Non- governmental organisation

O.P.D ..... Outpatient department

Prevalence ..... Number of old and new disease cases existing during a defined period of time

S.A.Q ..... Self- administered questionnaire

S/NO ..... Sample number

W.V.I ..... World Vision International

## EXECUTIVE SUMMARY

This study looks at the prevalence of diarrhoea in children aged one to five years and their families'ability to implement or support environmental control measures that reduce diarrhoea incidence in this age group from a micro level by taking Itala village (with 3000 people) and Mkushi Housing Estate(with 3000 people) as a comparative case study.

A cross-sectional study was conducted from December 1997 to February 1998 to collect the necessary data for this study. The information tools were parents of the children, departmental authorities and medical records. Further confirmation was done by an environmental survey. Data was entered into an EPS in-for 6 computer and analysed.

A sample of 100 respondents and 60 discussants randomly selected was drawn from 960 parents for a close-ended-precoded questionnaire and FGD respectively and two departmental officials were interviewed.

In the sample of respondents the average age was 30 years, average family size 9 people and average income K87,610. From each of the resdential areas 50 respondents answered the questionnaire and 30 discussants participated in FGDs. The main findings were:

- Diarrhoea prevalence [i.e170/1000], in both residential areas, was a problem. Both infectious and non infectious forms were present. Itala Village had a higher prevalence rate than the Housing Estate.

- Some families did not have the ability to implement or support environmental control measures as they were not exposed to intervention programmes, These were found to be; very poor (94%), illiterate (37%) and with too young parents (24%).
- The Test of significance on Itala Village shows that there was a relationship between diarrhoea prevalence and characteristics of attitude (P value = 0.00257930) and practice (P value = 0.03879086) unlike in the Housing Estate where income had an influence (P value = 0.093137).

Overall 97% of the parents demonstrated that they were implementing the various components of diarrhoea control programme and also complied with advice. The major deficiencies appear to be in identifying and relating to their needs such as in planning to alleviate poverty (as 94% were poor), avoiding early marriage (as 24% were young), acquiring good levels of education (as 37% were illiterate), providing quality water supplies (as all water sources had 1100 + MPN faecal coliforms) and enabling local authorities acquire a solid financial base to promote good sanitation, quality water supplies and health education programmes.

Recommendations are made to improve KAP, income, and policy formulation and implementation with the actual constraints in mind.

# CHAPTER 1 : GENERAL CONTEXT OF THE STUDY

## 1.1 Introduction.

As part of the requirements for the course leading to a Masters Degree in Public Health I from UNZA School of Medicine visited Mkushi Town from December 1997 to April 1998 to undertake an individual research project. Traditionally this has been a conclusion of data and information collection followed by writing of a dissertation within the three months period available.

The suggestion that I make an assessment of the prevalence of diarrhoea in children aged one to five years and the families ability to implement or support environmental control measures that reduce diarrhoea incidence in this age group was made by the District Council Secretary during a visit to his office early in 1996. Following preliminary discussions with the District Director of Health and the DAPP representative it was agreed that I should assess diarrhoea prevalence and the ability of families to implement or support environmental control measures that reduce diarrhoea incidence in the stated age group.

## 1.2 The District.

Mkushi district is located in Zambia's Central Province with a land area of 14,588 sq.km of mainly high plateau savannah. The population of 100 000 is mainly concentrated at Mkushi Town, Masansa, and along the Great North Road. This road corresponds closely to the main area of farming development. Large areas of land are under - used and population density averages 7/sq.km . 20% of the district people live in Mkushi Town and the adjacent catchment area.

The growth rate is estimated at 4.3% with almost half of the population under 15 years. The target groups for this project ( children aged 1-5 years and women between the ages of 15 and 49 years ) together comprise 40.2% of the population (1)

The district which in the early years of post independence enjoyed a high income from copper and commercial farming revenues has in recent years suffered a dramatic economic decline. Falling copper and commercial farming revenues, rising costs of imports and a high debt repayment burden have led to closure of the only mine, abandonment of some farms and a severe drop in real incomes. While much has been accomplished in the health sector there are now problems of maintaining basic health services throughout rural Mkushi District.

### 1.3 Health Services Background

#### 1.3.1 The District Health Policy

In Mkushi District since the advent of the MMD Government free health services have been made available only to children aged 5 years and below and adults aged 65 years and over regardless of socio-economic standing or nationality. The overall health objectives are stated to be (2):

1. To improve and expand health services to cover all areas of the district so that these facilities should be as close to the family as possible.
2. To maintain the present policy of providing these services free to those aged 5 years and below and 65 years and above.
3. To develop a network of basic health services embracing public health care and personal health services at the primary level, including environmental health and sanitary facilities through which an integrated programme of health work could be carried out, especially in

rural health centre catchment areas.

4. The district health priorities would be:

(a) primary health care.

(b) Training of health personnel

(c) Control of communicable diseases

(d) Improvement of maternal and child health (MCH)

(e) Environmental health

### 1.3.2 Health Problems

Table 1, Relevant Demographic Indices (2)

Crude birth rate----------50/1000 pop

Crude death rate----------19/1000 pop

Growth rate----------4.3%

Prenatal mortality----------50/1000 live births

Child mortality rate(5years and below) ----------117/1000 live births

Maternal mortality----------10-14/1000 live births

Population aged 1-5years----------16%

Women 15-49years----------24.2%

**Comment**

These indices are typical of Mkushi District. They show a high growth rate, high mortality rate and a large dependant population.

The disease pattern in the district reveals a high proportion of death and illness from

environmental and behavioural causes, respiratory disease, diarrhoea, malaria, malnutrition, anaemia, and injuries/accidents. This profile has shown little evidence of significant change during the past 5 years and has in some cases ( anaemia, diarrhoea, malaria, malnutrition) shown marked increases (2,3). The reasons for the trend lie in a combination of factors most paramount being the economic situation which has hindered the adequate provision of drugs and seriously constrained preventive efforts (3).

**1.4 Diarrhoea Disease Background**

Diarrhoea is a major public health problem in children. The 1996 World Health Organisation Regional Directors report shows that it is responsible for 4.5 million deaths of children aged five years and below, mainly in developing countries (4). Children of developing countries suffer from six diarrhoea episodes per year in the first five years of life.

In Africa this disease is among the leading causes of under five mortality in young children. The other equally important causes are measles, malaria and malnutrition (5)
In Zambia the situation is the same, the major causes of infant deaths are diarrhoea, malnutrition and malaria (6). Zambia has poor international health statistics. The mortality is 203 per 1000 children aged five years and below (7). The health of the population compares unfavourably with that of other countries. The country's average life expectancy at birth was 55 years for females and 53 years for males and has now fallen to 45.5 years for both women and men (8,9).

In Central Province where Mkushi District is located, the position is not different from that of the whole country. The mortality is 128 per 1000 children aged five years and below and diarrhoea accounts for 20%. The death rate from diarrhoea for children aged one

to five years is not known. Health facility records show 3 per 1000 i.e 0.3% (6). This figure is dubious.

In Mkushi District the under five mortality rate is 117 per 1000 children aged five years and below and the death rate from diarrhoea stands at 30 per 1000. Clearly these district rates resemble the national and provincial rates.

The world has known for a long time that it is possible to control diarrhoea with appropriate facilities for human waste disposal, access to safe water, food safety, refuse disposal, hygiene and health education (10). In developing countries like Zambia provision of such facilities, continues to be a challenge.

**1.5 Literature Review.**

Diarrhoea disease is an intestinal infection. It may be infectious or non - infectious (11). Non infectious diarrhoea in children may result from problems of digestion and absorption, allergies to certain foods like milk, unripe fruit, irritating plants, medicines, and poisons (12).

Diarrhoea may be either mild or severe and fatal. It is characterised by gradual to sudden onset of vomiting and a watery stool, which may lead to rapid dehydration, resulting in collapse and death. The incubation period ranges from a few hours to ten days.
Bacteria, viruses, parasites and protozoa are the main causes of diarrhoea in children aged one to five years (13). The specific organisms involved are salmonella, shigella, rotaviruses, amoeba, campylobacter, vibrio cholera, escherichia coli and giardia lamblia. Clinical diagnosis will require laboratory confirmation to determine the type, epidemic status and appropriate treatment.

The main sources and reservoir of infection are patients' faeces and vomitus, person incubating the disease and convalescents (14). Transmission is faecal - oral by contaminated water or foods or droplet spread. Soiled hands, utensils, flies and cockroaches also spread the disease

In Zambia the aim is to reduce the level of diarrhoea to 4% from 10% or 13% according to the Ministry of Health Information Unit (15). However, the disease is related to poverty and poor sanitary conditions which require government commitment, strategy, with community and voluntary organisations participation to resolve (10).

For effective control communities must have facilities for waste disposal, safe water, safe food and appropriate knowledge, attitudes, and practice (KAP) to facilitate interruption of transmission. Appropriate KAP includes good government and implementing agency policies, use of safe drinking water, hand washing after visiting the toilet and before touching food, good home and environmental hygiene and sanitation, eating only safe foods, boiling drinking water, reheating food before eating, and covering food to prevent flies and cockroaches resting on it (16)

Essentially, therefore, parents participation is required to prevent diarrhoea in the age group one to five years old. In a study by Bahl community participation and appropriate policies helped to reduce the prevalence of diarrhoea among children in the shanty compounds in Lusaka City in the 1970's (17). In Malawi boreholes provided safe water to reduce diarrhoea prevalence among children at a Mozambican refuge camp in the early 1990's (18). In Thailand KAP helped the Thais to reduce diarrhoea prevalence among children by eating

reheated food (18). In the Luapula Province of the Republic of Zambia where 97% of the population used sanitary facilities and boiled drinking water in the 1980's diarrhoea prevalence was reduced (19).

Indeed improvements in hygiene bestow many health benefits (20). But inspite of all these achievements change is difficult and requires separate stages. Resistance to change tends to decline when people are confronted with real problems amenable to behaviour change and help to change.This is supported by a study made in Lusaka, Kitwe, Kaputa and Mbala in 1994 which established that community response to diarrhoea out-breaks was poor due to their poor KAP and community participation where diarrhoea was seen as normal (21).

In concluding the literature review it is important to stress that appropriate management of diarrhoea diseases reduces prevalence in the community. Communities with good management i.e appropriate sanitation, water supply, KAP and treatment of cases have very low diarrhoea cases in the age group one to five years old. However, the degree of knowledge, attitude, and practice (KAP), number of amenities and frequency of use will have an impact on the prevalence.

Changes in excreta disposal methods when accompanied by sweeping changes in personal cleanliness, requiring improvement in water supply, housing and health education have effect on the prevalence of faecal-oral diseases. Interventions against person to person transmission routes and long transmission routes such as the contamination of food, crops or water sources with faecal material cut down diarrhoea prevalence greatly (22).

In this review the link between prevalence of diarrhoea and environmental control measures

has been indicated by four studies. In a study by Bahl, community participation and appropriate water supply and hygiene policies helped to reduce the prevalence of diarrhoea among children in the shanty compounds in Lusaka City in the 1970's; in Luapula province when 97% of the population used sanitary facilities and boiled drinking water in the 1980's diarrhoea prevalence was reduced; in Malawi boreholes provided safe water to reduce diarrhoea prevalence among children at a Mozambican camp in early 1990's; and Phonboon says that in Thailand the Thais reduced diarrhoea prevalence through the use of KAP.

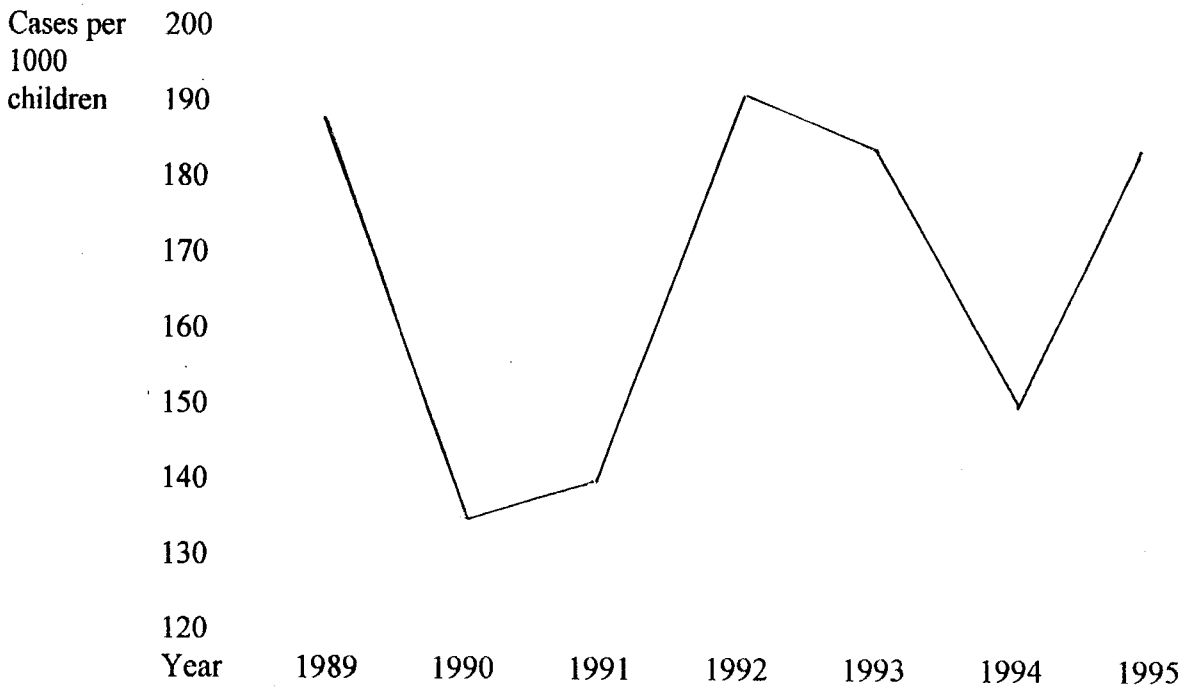
Consequently good policies, knowledge, attitude and practice are essential tools in the control of diarrhoea diseases. It is however, equally important to properly plan and organise, direct staff and co-ordinate the programme with adequate funding if good results are to be achieved (22).

**1.6 Statement of the Problem**

There has been a high prevalence of diarrhoea among children aged five years and below in Zambia from 1989 to 1995. Among the affected communities is Mkushi District in the Central Province. The figure below shows the national trends of diarrhoea disease prevalence over a period of seven years among children aged one to five years.

Fig 1: Diarrhoea Disease Prevalence in Children aged One to Five Years

per 1000 Children per year; 1989 to 1995




[Source ; MOH Bulletin of Health Statistics, Zambia, 1996]

During this period the prevalence ranged from 135 (13.5%) in 1990 to 190 (19.0%) in 1992 per 1000 children. The World Health Organisation says that any disease for which the prevalence is more than 10 per 1000 population (1%) is a public health problem (23). Diarrhoea is a gastrointestinal disease with sometimes a fatal short duration due to dehydration. Mkushi District with a population of 100 000 people reported 12, 706 cases of diarrhoea from 1994 to 1995 out of which 46 deaths were recorded. Despite preventive measures such as provision of protected water wells and ventilated improved pitlatrines and health education on knowledge, attitude and practice (KAP) initiated by the Ministry of Health and non governmental organisations such as the Development Aid from People to

People (DAPP), World Vision International (WVI) Harvest Help (HH), Medicin Sans Frontieres (MSF), Department of Water Affairs, and Mkushi District Council, the prevalence of diarrhoea has remained constantly high. The reasons for this are not clear.

In Mkushi District the problem affects the 16,000 children aged one to five years more than any other age group. The death rate is very high i.e 30 per 1000 considering that attendances at the health centres and records are poor and that diarrhoea is not only preventable but it is also curable.

It is questioned what impact the intervention programmes executed by the government and the non-governmental organisations have had on the Mkushi communities. Have the people of Mkushi experienced the non-infectious type of diarrhoea? Could the government and NGO intervention programmes be faulty? Could the recipients of the knowledge ( i.e mostly mothers) have forgotten what they had learnt, perhaps negligently, or instead were they the ones who had not participated in the intervention programmes?

No studies have been done in Mkushi to discover why the prevalence continues to be high when the aetiology of diarrhoea is known and the programmes of the government departments and NGO'S on knowledge, attitudes and practices of the recipients were adequate. Previous impact studies in Zambia have concentrated on the appropriate case management of diarrhoea as a strategy for reducing the prevalence of diarrhoea. There have been few if any studies linking prevalence of diarrhoea in the under five and the mother or care givers' practice of environmental measures that reduce the prevalence of diarrhoea.

Meanwhile both Mkushi Health Management Board and the Central Board of Health are

concerned about the high prevalence and have given targets. The Mkushi Health Management Board would like the rate to drop from 13% to 1% while the Central Board has suggested a drop to 4% in Zambia which would embrace non-infectious forms of diarrhoea. If answers to the questions raised above are found and implemented then the target might be achieved. To obtain the answers the families ability to implement/support and sustain environmental control strategies that reduce diarrhoea prevalence needs to be investigated.

## 1.7 Problem Justification

A lot has been done in Mkushi District in the area of diarrhoea disease control. The extent to which environmental related control strategies have played a role in the continued high prevalence of diarrhoea needs to be studied. Choosing Itala village and the Housing Estate as case studies is appropriate and cost-effective.

Diarrhoea prevalence is high and there have been many governmental and non-governmental groups working with the people to improve their health status, including the reduction of diarrhoea prevalence in children. Itala village will thus be used to evaluate the current environmental related control measures the district made.

Not all the children aged five years and below are the target for this study. The age group one to five years old is the target because it is more vulnerable to diarrhoea disease than those aged less than one year. The reasons are as follows;

The age specific diarrhoea prevalence associated with weaning peaks up in the second year of life and diminishes constantly thereafter because the mother's milk protects the nursing child against diarrhoea infections in its early months of life (24). Thereafter the child is

exposed to diarrhoea causative agents in the widest environment.

In addition, measles, malaria, and worm infestations which also cause diarrhoea affect children more frequently from the age of about one year due to loss of immunity and more exposure to the environment (25) Furthermore, in infancy i.e. zero to one year 90% of the cases are non-infectious, where-as in the age groups one to five years 90% of the cases are infectious diarrhoea which is preventable.

Most importantly an audit on diarrhoea disease and its connection with unsanitary conditions and communities' ability to protect themselves has not been evaluated despite projects carried out by government and donor organisations. There is therefore, an urgent need to carry out this assessment and see if any intervention measures could be implemented and relieve the people and children from such episodes.

## CHAPTER 2 : OBJECTIVES.

### 2.1 General Objectives:

To assess in Itala village and Mkushi Housing Estate the prevalence of diarrhoea disease among children aged one to five years and their parents' or families' ability to implement and or support environmental control measures that reduce diarrhoea incidence in this age group and in doing so answer the questions; Is diarrhoea a problem? Do families have the ability to implement or support environmental control measures that reduce diarrhoea incidence in this age group and does the possession of KAP and better socio-economic situations influence the level of diarrhoea prevalence in a family?

### 2.2 Specific Objectives:

* To determine the prevalence of acute and persistent diarrhoea in children aged one to five years;
* To determine the knowledge, attitude and practice of relevant environmental control strategies by households;
* To determine the socio-economic, demographic, educational and health background characteristics of parents with children having diarrhoea during the study period, and
* To determine the link between diarrhoea prevalence and environmental control measures.

### 2.3 Hypotheses

As revealed in the literature review ESHIUS and MANSCHOT (1978) were of the view that modern village and housing estates could be a community of a unique kind, which offered

children a chance to enjoy good health, grow and experience security in an assured context. It was thus my general belief and assumption that:

* Diarrhoea disease prevalence in children aged one to five years is low in families which have knowledge and appropriate attitudes and practices towards the diarrhoea disease;
* Prevalence in children aged one to five years is low in families with better socio-economic situations; and that
* A combination of KAP and good socio-economic state lowers the prevalence even further among children, especially those below the age of five years

**2.4 Variables**

As reflected in the statement of hypotheses the following two categories of variables were declared:

(1) Dependent variables:

- Prevalence of acute or persistent diarrhoea in a child aged one to five years;
- Parents knowledge;
- Parent's attitude;
- Parent's practices
- Parent's and child's hygiene;
- Availability and use of safe water;
- Availability and use of safe food;
- Nutrition status of child; and
- Exposure to anti-diarrhoea education

(ii) Independent variables;

- Age of mother;
- Sex of guardian;
- Marital status of parents;
- Family responsibility;
- Formal education
- Number of children and other dependants living with parent;
- Employment status of parent; and
- Availability of income in kind to the mother.

**2.5 Operational Definitions**

A number of questions were posed to provide a basis for operational definitions in order to bring variables to measurable or quantifiable levels. These are explained as follows:

1. Diarrhoea : refers to the passage of three or more watery stools within a period of 24 hours (26)
2. Diarrhoea case: is any child passing three or more watery stools within a period of 24 hours
3. Health problem : refers to any physical or mental illness for which the prevalence is more than 10/1000 (23)
4. KAP : is an abbreviation for knowledge, attitude, and practice;
5. Aetiology : refers to infectious or non-infectious cause (27)
6. Acute diarrhoea: refers to diarrhoea which is severe and of less than 14 days duration (26) and

7. Persistent diarrhoea: refers to diarrhoea which is severe and of 14 days duration or longer

## CHAPTER 3: METHODOLOGY

### 3.1 Research Design

A descriptive cross section study was carried out using data from the following sources:

- Review of hospital out and in patients records,
- Discussion with key informants,
- Questionnaire to literate parents,
- Focus group discussions with illiterate parents,
- Environmental survey checklist
- Entomological survey checklist
- Laboratory reports on stool specimen, bloodslides and water samples

### 3.2 : Research Setting

The case study was carried out in Itala village and Mkushi Housing Estate in Mkushi district. The district has a population of 100,000 people. The Tazara Railway and Great North Road which pass through provide outlet for a good network of commercial and peasant farm feeder roads which serve seventy-eight temporary health posts, ten health centres and one hospital. These health facilities serve 1300 villages. Malaria, diarrhoea, acute respiratory infections and malnutrition rank highest among the top ten diseases in the district.

In recent years since 1987 non-governmental organisations began offering health services to people. These organisations include Harvest Help in Luano Valley and DAPP, MSF and World Vision International on the plateau. Their programmes, though general, had included diarrhoea control. This study was intended to contribute towards the evaluation of diarrhoea control activities by these organisations and the Ministry of health.

The demographic information for the case study places was to be accessed from Mkushi Council and DAPP records. Itala village had 3,000 people out of which 16% were children aged one to five years and 22% were women of reproductive age. The village had piped water and four protected water wells. 80% of its 500 households used ventilated improved pit latrines and refuse pits and were directly serviced by Mkushi District Hospital. DAPP offered it logistic support and health education programme.

DAPP began operating in the village in 1990. Their general objective had been to improve the health of the children aged up to five years. The specific objectives were to improve sanitation, water supply, nutrition, child's vaccination status and parents KAP.

The village's economy was peasant farming of maize, potatoes, fruits, beans, vegetables etc. on small plots around it. Cattle, goats, pigs and chickens were also kept. A few people ran grocery shops and butcheries and others traded foodstuffs and second hand clothes. While some men and women worked for the government, banks, unions and co-operative societies, the majority made up the casual labour force of Mkushi town.

The Mkushi Housing Estate, also with 3,000 people and with similar demographic breakdown, was picked as a relatively better zone to gauge by comparison whether or not there were any meaningful similarities and differences between the two communities. In the Estate health amenities such as piped water, waterborne sanitation, electricity, public cleansing, vector and rodent control etc. were available. All residents of this area were in remunerative employment. Taken or considered together the two populations provided a target population of 960 parents with children aged one to five years.

### 3.3 Pretesting of Instruments

The questionnaire with close-ended questions targeted on parents was pretested in Mtendere Township of Lusaka City three months in advance to appraise its potential to yield valid and reliable data. This was followed by slight modification to improve comprehension and clarity

### 3.4 Sample Selection

The study population comprised 480 parents from Itala village and 480 parents from Mkushi Housing Estate, giving a total participation of 960 parents with children aged one to five years. Each one of the two residential zones contributed a sample of 50 parents and their children for the required total sample of 100 parents (10.42% of 960).

Systematic sampling with lottery technique was used to pick 50 subjects from each group to make the sample size 100. DAPP and Mkushi District Council provided numbered sampling frames. Every tenth household of the 500 constituted the child and its parent for the sample. The selection of the first household was done by lottery method i.e. tossing of a coin for head or tail. Data for Itala was kept separate from that for the Estate.

### 3.5 Criteria for Selection

The two residential zones were conveniently selected to indicate similarities or differences between the two communities. The comparison sample was to be 50 subjects in order to yield valid results for this study. Note that the requirement for the 't' test is a minimum of 30 subjects (28),

### 3.6 Sample Size

Determination of sample size was done by using the formula:

$$n = \frac{(P)(P-1)}{SE^2}$$

In this formular :

n = sample required i.e. number of subjects;

P = Diarrhoea prevalence = 10% as indicated in the literature review which has given a range of 10% to 13% (see page8) ;

P - 1 = 10 - 1 = 9 ; and

SE = Standard Error = 1.43

Applying this formula, therefore, n = 44. This study , therefore, required 50 subjects per group.

**3.7 Data Collection and Tools**

Data was collected using tools according to type required as follows :

- For data on policy, interviews were held with the District Director of Health and DAPP representatives using an open - ended questionnaire [appendix vi] and notes were taken;
- For data on KAP, demographic and socio-economic situation, six focus group discussions were organised for 60 illiterate mothers of children aged one to five years and the questionnaire with close - ended questions was distributed to 100 literate mothers [appendices iv andv ];
- For data on diarrhoea prevalence, hospital out and in patient records were checked and stool specimen and bloodslides of children aged one to five years were sent to the hospital laboratory and analysed; the 100 literate mothers provided the children .

- For data on water quality twelve water samples, six for chemical and six for bacteriological analyses, were collected from four wells, Chibefwe river and kitchen tap and sent to the Public Health Laboratory, Lusaka and were analysed.

**3.8 Plan for Data Analysis**

Diarrhoea prevalence was calculated from morbidity data due to diarrhoea, measles, malaria (29) and malnutrition from Mkushi Hospital out and in patients records for the previous one month i.e. December 1997. Stool specimen analyses and bloodslides observations allowed the diarrhoea prevalence in the sample to be extrapolated to the population and categorised as infectious or non-infectious. The results of water sample analyses gave the impact of water use on diarrhoea occurrence, environmental and entomological survey information indicated whether or not the areas were conducive to proper control of diarrhoea diseases. Policies on food, water, sanitation, diarrhoea disease control unit funding, community participation and health education were scrutinised for appropriateness for diarrhoea disease control. Notes taken on focus group discussions were reviewed immediately after the end of every session.

The close - ended questionnaire data were checked and coded. The responses were checked for errors and omissions. The data master sheet and computer were used. A detailed list was prepared showing the acceptable range of data and indicating specific combinations of data which were acceptable or unacceptable and obvious errors were removed. A picture of the frequency distribution of all the variables was obtained along with means and percentages. All the information was tabulated. The variables were cross - tabulated and indicated the socio- economic classes of the parents and their children in both samples. The Chi-square

was used to look at the significance of the results.

### 3.9 Ethical Considerations or Issues

Sensitive personal questions were avoided in both the close-ended and open -ended questionnaires. Strict courtesy to the stakeholders, the mother and child, as practised in the area, was observed. Respondents and stakeholders were informed of the purposes of the study and individual consent was obtained from them to participate. Confidentiality was assured. Stakeholders are allowed to use the results of this work to strengthen their activities in the field of child health.

The Directorate of Post Graduate Studies of the University of Zambia granted permission to proceed with the research after clearance was obtained from the Ethics Committee and the Department of Community Medicine of the School of Medicine.

# CHAPTER 4 : DATA ANALYSIS AND PRESENTATION OF FINDINGS

## 4.1 Introduction

The study sought to assess the prevalence of diarrhoea in children aged one to five years and the families' ability to implement or support environmental control measures that reduce diarrhoea incidence in this age group in Itala village and Mkushi Housing Estate. It looked into the following aspects;

- Demographic information
- Prevalence of acute or persistent diarrhoea in children aged one to five years
- Parents' knowledge
- Parents' attitude
- Parents' practices
- Parents' and childrens' hygiene
- Availability and use of safe water
- Availability and use of safe food
- Nutrition status of children; and
- Exposure to anti-diarrhoea education ie residential status

In this chapter the findings from the questionnaires, stool and blood examinations, focus group discussions, environmental survey,entomological survey and hospital records are presented. On the basis of the results of the questionnaire completed by 100 literate parents of Itala village (50) and Mkushi Housing Estate (50) clarification was established on variables. The findings are explained and illustrated as follows:

## 4.2 Demographic Information

Relevant demographic information collected included data on age, sex, marital status, household head, relationships to child, formal education level, family size, religion, occupation, income per month and income in kind. According to David Morley et al, these are factors that directly or indirectly determine a child's health (30). Their distributions in the sample were as follows

Table 2: Demographic Distribution by Age

| Respondents' | Frequency in | | | Percentage in | | | Average % | | |
|---|---|---|---|---|---|---|---|---|---|
| Age in Years | Itala | Estate | Total | Itala | Estate | Total | Itala | Estate | Total |
| < 20 | 3 | 3 | 6 | 6 | 6 | 6 | | | |
| 20 - 24 | 13 | 5 | 18 | 26 | 10 | 18 | | | |
| 25 - 29 | 16 | 12 | 28 | 32 | 24 | 28 | | | |
| 30 - 34 | 5 | 10 | 15 | 10 | 20 | 15 | | | |
| 35 - 39 | 3 | 7 | 10 | 6 | 14 | 10 | 2 | 2 | 1 |
| 40 - 44 | 7 | 8 | 15 | 14 | 16 | 15 | | | |
| 45 - 49 | 1 | 1 | 2 | 2 | 2 | 2 | | | |
| 50 - + | 0 | 2 | 2 | 0 | 4 | 2 | | | |
| Not Shown | 2 | 2 | 4 | 4 | 4 | 4 | | | |
| Total | 50 | 50 | 100 | 100 | 100 | 100 | | | |

* Average Ages : Itala = 28 years, Estate = 31 years, and Average Total = 30 years

It is asserted that the older the parents become the more knowledgeable they are about child health. Table 2 shows that more of the respondents were in the young age groups < 20, 20 - 24 25 - 29 years [ ie 6%, + 18% + 28% = 52% ]

Table 3: Demographic Distribution by Sex

| Respondents' Sex | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1.Males | 5 | 13 | 18 | 10 | 26 | 18 |
| 2. Females | 45 | 37 | 82 | 90 | 74 | 82 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

It is established that female parents are better child caretakers than their male counterparts. Table 3 shows that the mojority of respondents were female [ ie 82%].

Table 4: Demographic Distribution by Marital Status

| Respondents' Marital Status | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Single | 5 | 2 | 7 | 10 | 4 | 7 |
| 2. Married | 43 | 48 | 91 | 86 | 96 | 91 |
| 3 Widowed | 2 | 0 | 2 | 4 | 0 | 2 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

It is held that married couples have more resources to use on their children than single parents. Table 4 shows that 91 (91%) of the respondents were married, 7 (7%) were single and 2 (2%) were widowed.

Table 5. Demographic Distribution by Household Head

| Respondents' Household Head | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Male | 44 | 46 | 90 | 88 | 92 | 90 |
| 2. Female | 6 | 4 | 10 | 12 | 8 | 10 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

Generally in Africa male headed households have more resources to afford a child's good health but children in female headed households stand a better chance of accessing resources. Table 5 shows that the mojority of households were headed by males 90 (90%).

Table 6: Demographic Distribution by Relationship to Child

| Respondents' Relationship to Child | Frequeny in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Mother | 40 | 36 | 76 | 80 | 72 | 76 |
| 2. Father | 5 | 10 | 15 | 10 | 20 | 15 |
| 3.Guardian | 5 | 4 | 9 | 10 | 8 | 9 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

Beth Hess et al assert that parents care more for their biological children (31).The majority of the respondents indicated in table 6, were biological mothers 76 [76%], 15 [15%] biological fathers, and 9 (9%) guardians.

Table 7: Demographic Distribution by Formal Education Levels

| Respondents' Education Level | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Primary | 29 | 8 | 37 | 58 | 16 | 37 |
| 2. Secondary | 19 | 31 | 50 | 38 | 62 | 50 |
| 3. College | 2 | 11 | 13 | 4 | 22 | 13 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

It is generally held that better formally educated people are better knowledgeable and so care for their children well. Table 7 shows that 37 (37%) of the respondents were of primary school education and 50 (50%) secondary.

Table 8: Demographic Distribution by Family Size

| Respondents' Family Size | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Small (up to 8) | 25 | 22 | 47 | 50 | 44 | 47 |
| 2. Big (> 8) | 25 | 28 | 53 | 50 | 56 | 53 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

It has been observed that there is better care for children in small families . Table 8 however shows that a larger number of respondents 53 (53%) had big families. The average family size in both Itala and Estate areas was 9 members.

Table 9 Demographic Distribution by Religion

| Respondents' Religion | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Christian | 50 | 49 | 99 | 100 | 98 | 99 |
| 2. Moslem | 0 | 1 | 1 | 0 | 2 | 1 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

The same authors have established that religious peers influence each other in the up keep of their children . Table 9 shows that almost all of the respondents were christian 99 [99%].

Table 10: Demographic Distribution by Occupation

| Respondents' Occupation | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Worker | 29 | 42 | 71 | 58 | 84 | 71 |
| 2. Farmer | 1 | 2 | 3 | 2 | 4 | 3 |
| 3. Business person | 20 | 6 | 26 | 40 | 12 | 26 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

Paul Samuelson says generally regular income ensures there is care for the children (32). Table 10 shows that 71 (71%) respondents were workers, 3 (3%) were farmers and 26 (26%) were business persons.

Table 11: Demographic Distribution by Income per Month

| Respondents' Income Per Month | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | total | Itala | Estate | Total |
| 1. < K100,000 | 30 | 19 | 49 | 60 | 38 | 49 |
| 2. K100,000 - 150,000 | 4 | 14 | 18 | 8 | 28 | 18 |
| 3. K151,000 - 200,000 | 1 | 4 | 5 | 2 | 8 | 5 |
| 4. K201,000 + over | 4 | 6 | 10 | 8 | 12 | 10 |
| 5. Not Indicated | 11 | 7 | 18 | 22 | 14 | 18 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

* Note : Average income; Itala = 73,520, Estate = 101,700 , and Total = 87,610 per month

Labour unionism argues that a living wage ensures that there is care for the children Table 11 shows that the majority of respondents, 72 (72%) were earning less than K210,000 per month necessary for life sustenance in Zambia at current prices [ie December 1997 ].

Table 12: Demographic Distribution by Income in Kind

| Respondents' Income in Kind | Frequence in Itala | Estate | Total |
|---|---|---|---|
| 1. Maze | 25 | 19 | 44 |
| 2. Beans | 6 | 10 | 16 |
| 3. Cattle | 1 | 1 | 2 |
| 4. Chickens | 10 | 18 | 28 |
| 5. Goats | 5 | 0 | 5 |
| 6. Others i.e Groundnuts, cashcrops, vegetables and fruits etc | 4 | 3 | 7 |

Beth B Hess et al say that in most societies income in kind either supplements or complements regular income and ensures care for the children in many families (33). Table 12 shows the distribution of income in kind among respondents.

Table 13: Demographic Distribution by F.G. Discussions

| Respondents' Residence | Number of Sessions | Required Attendance | Actual Attendance | Percentage % of Actual Attendance |
|---|---|---|---|---|
| 1. Itala | 3 | 30 | 25 | 41.6 |
| 2. Estate | 3 | 30 | 21 | 35 |
| Total | 6 | 60 | 46 | 76.6 |

The average age of the mothers was 39 years with a range of 20 years. The youngest illiterate mother was 30 years old. Out of 60 expected, attendance in Itala was 41.6% and in the Estate 35%.

### 4.3 Prevalence of Diarrhoea by History Taking

The level of infectious and non-infectious stool was determined by laboratory analyses of stool specimen. Prevalence was the summation of acute and persistent diarrhoea in the sample of 100 children and this was compared to prevalence among out and in patient children aged one to five years in the month of December 1997. Their distributions were as follows;

Table 14: Stool Specimen Examinations for Diarrhoea Organisms

| Respondents' Children's' Stool Condition | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Infectious Stool | 13 | 21 | 34 | 26 | 42 | 34 |
| 2. Non-infectious Stool | 31 | 20 | 51 | 62 | 40 | 51 |
| 3. Specimen not Submitted | 6 | 9 | 15 | 12 | 18 | 15 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

Table 15: Prevalence of Diarrhoea by History Taking

| Respondents' Children's' Condition | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Suffering from Diarrhoea | 13 | 4 | 17 | 26 | 8 | 17 |
| 2. Not suffering from Diarrhoea | 37 | 46 | 83 | 74 | 92 | 83 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

*Note: This gives a prevalence rate of 170/1000

Table 14 Shows that out of 100, 34% specimen were positive for diarrhoea organisms and 51% were negative. However, on history taking [ie table 15 ] it was revealed that the majority of those whose stool were negative did not have diarrhoea and those who had positive specimens had more diarrhoea. Out of 17 diarrhoea cases 13 were acute and 4 were persistent diarrhoea. Of the acute diarrhoea the majority [9] were from Itala Village and the minority [4] were from Mkushi Estate. However, all the persistent diarrhoea cases [4] were from Itala Village.

Table 16. Prevalence of Diarrhoea Among Out and In Patient Children Aged 1- 5 Years for December, 1997

| Residence of Origin | Total Attend-ance | Diarrhoea Cases | Worm cases | Malaria Cases | Other | Deaths |
|---|---|---|---|---|---|---|
| 1. Itala | 59 | 14 | 2 | 30 | 13 | 10 |
| 2. Estate | 49 | 3 | 1 | 19 | 26 | 2 |
| Total | 108 | 17 | 3 | 49 | 39 | 12 |

*Source : Mkushi District Hospital Registers and Cards, December 1997.

In table 16 "other" refers to sores, upper respiratory tract infections, trauma, conjuctivitis, gingivitis, bronchitis, dogbite and allergy. There were no measles and malnutrition cases.

### 4.4 Parents' Knowledge About Diarrhoea

The Knowledge of parents about diarrhoea was assessed from the self-administered questionnaire and focus group discussious and established the following facts:

Table 17: Knowledge of Definition of Diarrhoea

| Respondents' Status | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Can define | 32 | 40 | 72 | 64 | 80 | 72 |
| 2. Can not define | 18 | 10 | 28 | 36 | 20 | 28 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

A significant number of people did not know how to determine a diarrhoea case. They represent 28% [Table 17].

Table 18: Contaminated Water as Cause of Diarrhoea

| Respondents' Status | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Know water is Conveyor | 44 | 45 | 89 | 88 | 90 | 89 |
| 2. Do not Know | 6 | 5 | 11 | 12 | 10 | 11 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

Most of the respondents knew that contaminated or dirty water caused diarrhoea. 89% were knowledgeable as opposed to 11% who did not know [Table18].

Table 19: Measles or Malaria as contributing cause of Diarrhoea

| Respondents' Status | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Know Measles or Malaria is contributing factor | 12 | 11 | 23 | 24 | 22 | 23 |
| 2. Do not know | 38 | 39 | 77 | 76 | 78 | 77 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

77% of the respondents did not have any knowledge of measles or malaria as a contributory factor to diarrhoea as opposed to 23% who had an idea [Table 19]

Table 20: Bloodslide Examinations for Malaria Parasites

| Respondents' Status | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Children's Bloodslides positive | 18 | 24 | 42 | 36 | 48 | 42 |
| 2.Children's bloodslides negative | 32 | 26 | 58 | 64 | 52 | 58 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

Bloodslides examinations revealed a malaria prevalence among children of 42%.

Table 21 Allergy to Food as Cause of Diarrhoea

| Respondents' Status | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Know allergy can cause diarrhoea | 18 | 17 | 35 | 36 | 34 | 35 |
| 2. Do not know | 32 | 33 | 65 | 64 | 66 | 65 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

65 % of the respondents did not know about food allergies as against 35% who had some perception about this as a factor for diarrhoea.

Table 22: Contaminated Food as a Cause of Diarrhoea.

| Respondents Status | Frequency in: | | | Percentage % in : | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Know food is conveyor | 42 | 47 | 89 | 84 | 94 | 89 |
| 2. Do not know | 8 | 3 | 11 | 16 | 6 | 11 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

Table 22. shows the majority of the respondents [89%] had a very clear idea about contaminated food as a major contributing factor to diarrhoea.

Table 23: Feeding Normally as a Diarrhoea Management Method

| Respondents' Status | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Know feeding normally is good for child | 36 | 41 | 77 | 72 | 82 | 77 |
| 2. Do not know | 14 | 9 | 23 | 28 | 18 | 23 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

The majority of respondents knew that a child with diarrhoea must be fed normally. 77% were knowledgeable as opposed to 23% who were not [Table 23 ].

Table 24: Giving Salt-sugar Solution as a Diarrhoea Management Method

| Respondents' Status | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Know about giving salt sugar solution | 48 | 48 | 96 | 96 | 96 | 96 |
| 2. Do not Know | 2 | 2 | 4 | 4 | 4 | 4 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

Almost all the people (96%) in this area knew the use of salt- sugar solution during diarrhoea episodes [Table 24].

Table 25: Giving Medicines as a Diarrhoea Management Method

| Respondents' Status | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Know about giving medicine | 46 | 44 | 90 | 92 | 88 | 90 |
| 2. Do not know | 4 | 6 | 10 | 8 | 12 | 10 |
| Total | 50 | 50 | 10 | 100 | 100 | 100 |

Table 25 shows that 90% of the parents preferred to use medicines in the management of diarrhoea.

Table 26: Taking case to Hospital/Health Centre as a Diarrhoea management method

| Respondents' Status | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Know about taking case to Hospital or health centre | 46 | 48 | 94 | 92 | 96 | 94 |
| 2. Do not know | 4 | 2 | 6 | 8 | 4 | 6 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

However, though they knew how to manage diarrhoea at home using salt-sugar solution and medicines most parents preferred to take their children to the hospital or health centre. They represent 94% as against 6% who did not [Table 26]

Table 27 :Focus Group Discussions on Knowledge about Diarrhoea

| Variable | Correct answers | | Incorrect answers | | Total |
|---|---|---|---|---|---|
| | Itala | Estate | Itala | Estate | Responses |
| 1. Definition of diarrhoea | 18 | 17 | 11 | 4 | 50 |
| 2. Cause of Diarrhoea | 24 | 16 | 5 | 5 | 50 |
| 3. Action on diarrhoea | 15 | 18 | 14 | 3 | 50 |
| 4. Prevention of diarrhoea | 29 | 21 | 0 | 0 | 50 |

Table 27 shows that most of the illiterate parents attending in focus group discussions [FGD] knew how to prevent diarrhoea. Whereas out of 50 participants 15 could not define it, 10 did not know the cause and 17 did not take any action against it both in Itala village and Mkushi Housing Estate.

### 4.5 Parents' Attitude to Diarrhoea

The attitudes of parents to diarrhoea was also assessed from the self-administered questionnaire and focus group discussions and gave the following facts:

Table 28: Attitude to Diarrhoea by Considering it as a danger

| Respondents' perception of diarrhoea | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Dangerous | 48 | 49 | 97 | 96 | 98 | 97 |
| 2. Not dangerous | 2 | 1 | 3 | 4 | 2 | 3 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

Most parents (97%) reflected a good attitude to diarrhoea by considering it a danger.

Table 29: Attitude to Diarrhoea Disease by Compliance with Health Advice on its Control

| Respondents' Status | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Comply with advice | 48 | 49 | 97 | 96 | 98 | 97 |
| 2.Do not comply | 2 | 1 | 3 | 4 | 2 | 3 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

Most respondents (97%) knew that to prevent diarrhoea they needed to comply with health advice. This also reflects a good attitude.

Table 30: Focus group Discussions on Attitude to Diarrhoea

| Variable | Positive Attitude | | Negative Attitude | | Total Responses' |
|---|---|---|---|---|---|
| | Itala | Estate | Itala | Estate | |
| 1. Diarrhoea is dangerous | 29 | 21 | 0 | 0 | 50 |
| 2. Comply with health advice | 21 | 10 | 8 | 11 | 50 |

19 out of 50 illiterate parents did not comply with health advice. However, all the respondents regarded diarrhoea as a dangerous disease, thus reflecting a good attitude [table 30].

### 4. 6 Parents' Practices Against Diarrhoea

The Practices of parents against diarrhoea were also assessed from the self-administered questionnaire and focus group discussions and raised the following facts:

Table 31: Handwashing Habit after using Toilet

| Respondents' Habit | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Wash hands after using toilet | 44 | 49 | 93 | 88 | 98 | 93 |
| 2. Do not wash hands | 6 | 1 | 7 | 12 | 2 | 7 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

Table 31 shows that most respondents washed their hands always after using a toilet. They represent 93%.

Table 32: Fruit-washing Habit before Child eats it

| Respondents' Habit | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Wash fruit always before child eats it | 47 | 44 | 91 | 94 | 88 | 91 |
| 2. Do not wash fruit always | 3 | 6 | 9 | 6 | 12 | 9 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

Also washing of fruit before giving it to a child to eat was always done by most respondents. They represent 91%.

Table 33: Focus Group Discussion on Practices Against Diarrhoea

| Variable | Itala Village | | Housing Estate | | Total Responses |
|---|---|---|---|---|---|
| | Yes | No | Yes | No | |
| - Child has diarrhoea | 9 | 26 | 3 | 12 | 50 |
| -Mother washes hands always after using toilet | 29 | 0 | 21 | 0 | 50 |
| -Mother washes fruit always for child | 0 | 29 | 3 | 18 | 50 |
| -Mother uses safe source of water | 17 | 12 | 21 | 0 | 50 |
| -Mother has and keeps clean toilet | 19 | 10 | 18 | 3 | 50 |

Only 12 out of 50 participating parents gave history of diarrhoea among the children. Almost all the parents exhibited satisfactory sanitary practices as seen in Table 33.

### 4.7 Parents' And Children's Hygiene

The hygiene of parents and children was assessed from the self-administered questionnaire, focus group discussions (Table 33), environmental and entomological surveys and gave the following facts:

Table 34: Keeping Child Clean as a Diarrhoea Preventive Measure

| Respondents' Action | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Keep children clean | 43 | 44 | 87 | 86 | 88 | 87 |
| 2. Do not keep children clean | 7 | 6 | 13 | 14 | 12 | 13 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

A notable proportion of 13% of respondents did not have knowledge on the prevention of diarrhoea by keeping a child clean [Table 34]

Table 35: Toilet Facility Use

| Respondents' Status | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Have dry sanitation(latrine) | 49 | 0 | 49 | 98 | 0 | 49 |
| 2. Have water borne sanitation (flush toilets) | 0 | 50 | 50 | 0 | 100 | 50 |
| 3. Do not have toilet (ie use others/bush) | 1 | 0 | 1 | 2 | 0 | 1 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

The majority of respondents, both in Itala Village [98%] and Mkushi Housing Estate [100%], enjoyed the use of pit and flush latrines [Table 35 ]

Table 36: Disposal of Refuse or Rubbish

| Respondents' Status | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Have refuse pits | 40 | 41 | 81 | 80 | 82 | 81 |
| 2. Do not have refuse pits | 10 | 9 | 19 | 20 | 18 | 19 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

81% of respondents had refuse pits as against 19% who did not have [Table 36]

Table 37: Cockroach and Housefly Infestation in Houses

| Infestation | | Itala Village | | | | Housing Estate | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Houseflies | | Cockroaches | | Houseflies | | Cockroaches | |
| Intensity | Description | Houses | % | Houses | % | Houses | % | Houses | % |
| Level 5 | Heavy | 24 | 12.8 | 42 | 22.6 | 0 | 0 | 0 | 0 |
| Level 4 | Critical | 26 | 14.2 | 24 | 12.8 | 0 | 0 | 0 | 0 |
| Level 3 | Moderate | 44 | 23.9 | 28 | 15.4 | 0 | 0 | 25 | 17 |
| Level 2 | Considerable | 34 | 18.5 | 31 | 16.6 | 0 | 0 | 29 | 20 |
| Level 1 | Light | 32 | 17.2 | 33 | 17.8 | 0 | 0 | 37 | 26 |
| Level 0 | None | 25 | 13.4 | 27 | 14.8 | 143 | 100 | 52 | 37 |
| | Total | 185 | 100 | 185 | 100 | 143 | 100 | 143 | 100 |

* Note : The average number of insects found dead in each house was 26 houseflies and 14 cockroaches

Table 38: Cockroach and Housefly Infestation in Latrines

| Infestation | | Itala Village | | | | Housing Estate | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Houseflies | | Cockroaches | | Houseflies | | Cockroaches | |
| Intensity | Description | Latrines | % | Latrines | % | Latrines | % | Latrines | % |
| Level 5 | Heavy | 21 | 12.8 | 37 | 22.7 | 0 | 0 | 0 | 0 |
| Level 4 | Critical | 23 | 14.2 | 21 | 12.9 | 0 | 0 | 0 | 0 |
| Level 3 | Moderate | 39 | 23.9 | 25 | 15.3 | 0 | 0 | 0 | 0 |
| Level 2 | Considerable | 30 | 18.5 | 27 | 16.6 | 0 | 0 | 0 | 0 |
| Level 1 | Light | 28 | 17.2 | 29 | 17.8 | 0 | 0 | 0 | 0 |
| Level 0 | None | 22 | 13.4 | 24 | 14.7 | 143 | 100 | 143 | 100 |
| Total | | 163 | 100 | 163 | 100 | 143 | 100 | 143 | 100 |

* Note average number of insects found dead in each latrine was 26 houseflies and 14 cockroaches

Evidence of pests, mainly houseflies, cockroaches and mosquitoes was available and helps gauge the standard of hygiene. In Itala Village of the 185 houses [25 % of the total] sampled 115 had houseflies and 143 had cockroaches. The Estate's sample of 143 houses [25% of total] did not show significant levels of housefly and cockroach infestation in kitchens and water closet compartments. Instead significant levels of cockroach infestation were found in septic tanks [67%]. Mosquito larvae and pupae were seen in stagnant water collections close to people's houses in both residential areas. To determine levels of infestation for both houseflies and cockroaches, the likert scale was used [Tables 37 and 38].

Table39: Sanitation Survey

| Development | Perm House | Temp House | No rooms to House | Pop to Room | Water Closet | Dry Latrines | Refuse pits |
|---|---|---|---|---|---|---|---|
| 1. Itala Village | 40 | 700 | 1 | 6 | 0 | 650 | 472 |
| 2 House. Estate | 572 | 0 | 5 | 6 | 540 | 0 | 504 |
| 3. Two Markets | semi | semi | 1 | n/a | 1 battery | 1 battery | 2 |
| 4. Bus station | 1 | 0 | 1 | n/a | 2 | 0 | 1 |
| 5. Butcheries | 7 | 0 | 2 | n/a | 3 | 8 | 7 |
| 6. Bars | 9 | 0 | 3 | N/A | 8 | 19 | 9 |
| 7. Restaurants | 5 | 0 | 3 | N/A | 8 | 0 | 5 |
| 8. Schools | 3 | N/A | N/A | N/A | 2 battery | 1 battery | 3 |

Whilst the condition of waterborne latrines was good, that of dry ones was fair [Table 39]. There is no provision of controlled refuse tipping. The disposal method promotes fly-breeding. Scientific management of refuse was lacking. This kind of environment supported 512 and 455 children aged one to five years in Itala Village and Housing Estate respectively. About 75% of the population in both residential areas was migrant [ie Itala - 4545 and Estate - 3432] .

**4.8 Availability And Use of Safe Water**

The availability and use of safe water was assessed from the self-administered questionnaire, focus group discussions [Table 33] and environmental survey and established the following facts:

Table 40: Use of Safe Drinking Water as a Diarrhoea Preventive Measure

| Respondents' Status | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Use safe drinking water | 47 | 46 | 93 | 94 | 92 | 93 |
| 2. Use any drinking water | 3 | 4 | 7 | 6 | 8 | 7 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

93% of the parents had knowledge for the use of safe drinking water.

Table 41: Water Supply Use

| Respondents' Status | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Use Protected water wells | 22 | 0 | 22 | 44 | 0 | 22 |
| 2. Use tap water | 23 | 50 | 73 | 46 | 100 | 73 |
| 3. Use river water | 5 | 0 | 5 | 10 | 0 | 5 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

As has been shown in table 41 the majority of respondents [95%], both in Itala Village and Housing Estate, had facilities for protected and tap water supply.

Table 42: Bacteriological Analyses of Well, River, Piped Water from Itala and Estate.

| S/No. | Source | APC [per/ML] | Faecal Coliforms (MPN) | E.Coli | Salmonella Shigella | Vibrio Cholera |
|---|---|---|---|---|---|---|
| 1. | Anatovic well | $2x10^2$ | 1100+ | Positive | Negative | Negative |
| 2. | Edson PhiriWell | $3x\ 10^2$ | 43 | Positive | Negative | Negative |
| 3. | ToptenWell | $4x10^3$ | 1100+ | Positive | Negative | Negative |
| 4. | Mulundu Well | $5x10^3$ | 23 | Positive | Negative | Negative |
| 5. | Pipedwater(treated) | $2x10^3$ | 1100+ | Positive | Negative | Negative |
| 6. | Chibefwe River | 4x10 | 1100+ | Positive | Negative | Negative |

Source : Public Analyst, Food and Drugs Control Laboratory, P. O Box 30138, Lusaka, Zambia. -16th. March 1998.

Whereas the majority of respondents [95%] had facilities for protected and tap water supply [Table 41], Table 42 shows that all the three water supply sources were of poor quality. E. Coli type 1 was isolated from all the water samples. The presence of E. Coli indicates faecal contamination and thus the water was not fit for human consumption. There was no pesticide residue detected in all the samples.

### 4.9 Availability And Use Of Safe Food

The availability and use of safe food was assessed from the self-administered questionnaire focus group discussions [table 33] and sanitation survey [table 39] and raised the following facts;

Table 43: Use of Safe Food as a Diarrhoea Preventive Measure

| Respondents' Action | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Give child safe food | 41 | 37 | 78 | 82 | 74 | 78 |
| 2. Give child any food | 9 | 13 | 22 | 18 | 26 | 22 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

Though the use of safe drinking water was appreciated a notable proportion had no knowledge about giving a child safe food. They represent 22% of respondents [Table 43]

Table 44 Giving Child Safe Fruit as a Diarrhoea Preventive Measure

| Respondents Action | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Give child safe fruit | 46 | 48 | 94 | 92 | 96 | 94 |
| 2. Give child any fruit | 4 | 2 | 6 | 8 | 4 | 6 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

Table 44 shows that 94% of the parents knew that diarrhoea could be prevented by giving a child safe fruit.

**4.10 Nutrition Status Of Children**

The nutrition status of children was assessed from the self-administered questionnaire and established the following facts;

Table 45 :Prevalence of Diagnosed Cases of Malnutrition

| Respondents Children's Status | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Undernourished | 36 | 35 | 71 | 72 | 70 | 71 |
| 2. Nourished | 14 | 15 | 29 | 28 | 30 | 29 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

The majority [71%] of the children diagnosed were undernourished

**4.11 Exposure to Anti-diarrhoea Education**

Exposure to anti-diarrhoea education was assessed from the self-administered questionnaire and gave the following facts:

Table 46: Exposure to Education by Residential Status

| Respondents Residential Status | Frequency in | | | Percentage % in | | |
|---|---|---|---|---|---|---|
| | Itala | Estate | Total | Itala | Estate | Total |
| 1. Migrant [< 5 yrs stay] | 22 | 22 | 44 | 44 | 44 | 44 |
| 2. Permanent [> 5 yrs stay] | 23 | 24 | 47 | 46 | 48 | 47 |
| 3. Not indicated | 5 | 4 | 9 | 10 | 8 | 9 |
| Total | 50 | 50 | 100 | 100 | 100 | 100 |

Only permanent residents benefited from the anti-diarrhoea education programmes implemented by MOH and DAPP at the time these were funded. Table 46 shows that 44 [44%] of the respondents were migrants and were not exposed to anti- diarrhoea education.

**4.12 Comment On Environmental Survey [ Table 39 ]**

The Survey of Itala and Housing Estate was done in December 1997. People were most likely to attend health education in the afternoons over weekends. Prayer healing rather than use of drugs was common. Land shortage in both residential areas restricted vegetable growing. From January to mid February Itala experienced food shortage. While bottle feeding was used by some families in the Estate, it was not in Itala Village. The Itala population [60%] consumed more alcohol and tobacco than the Housing Estate [1%]. Foods were mostly eaten cold. Diarrhoea and malaria were indicated by residents and hospital records as among the main disease problems requiring attention. The impact of over-crowding was felt more in Itala Village than in the Estates. More Parents were either illiterate or lowly educated in Itala Village than in the Estate. Both government and non-governmental organisations were not fully involved in the promotion of environmental health. Whilst the Housing Estate was developing by government sanction, Itala Village was growing spontaneously. The village had neither a school nor a health centre.

**4.13 Policy Matters on Diarrhoea Control**

These were discussed with the representatives of the District Director of Health and DAPP. They relate to food hygiene, water supply, sanitation, diarrhoea case management, funding, community response to diarrhoea disease control programmes and a system of health education in place.

From the outset it was noted that both organisations either reduced their activities in both residential areas or totally withdrew. Government health action lessened when the council environmental health technician retired and was not replaced in 1992. DAPP withdrew from

Itala Village due to urban attitudes influencing this community that led to response to self-help activities being poor.

Both MOH and DAPP did not offer any direct help as regards food hygiene. A food handlers' hygiene programme was stopped. In the area of water supplies, water well hygiene, boiling of water and clean keeping of water containers could not be sustained. Sanitation activities intended to promote the provision and hygienic use of toilets and refuse pits and handwashing habits every time these facilities were used, were done irregularly. Diarrhoea management to promote the use of rehydration therapy through oral rehydration salts (ORS) at home and ORT corners at the hospital could not be continued. The diarrhoea management unit stopped working. The proportion of funding for diarrhoea control in both budgets was silent. Both organisations incorporated it in the family health programme fund which also covered 12 primary schools and 17 pre-schools.

Community response to diarrhoea disease control programmes was minimal. Piped water was never boiled because it was regarded safe. The health education programme was defective as it was not formally executed. The informal method was a chance occurrence, undependable and ineffective. The curative and preventive health programmes were improperly related or linked as data was not reliable.

# CHAPTER 5 : DISCUSSION OF FINDINGS

## 5.1 Introduction

In this study diarrhoea prevalence among children aged one to five years and families' ability to implement and or support environmental control strategies or measures that reduce diarrhoea incidence were assessed. Comparisons were made between Itala Village and Housing Estate to establish any differences or similarities. These are presented in this chapter.

## 5.2 Diarrhoea Prevalence

Table 47: Diarrhoea Prevalence by History Taking and Laboratory Analyses

| Source | Diarrhoea cases | | | Sample |
|---|---|---|---|---|
| | Itala | Estate | Total | |
| 1. F.G.D | 9 | 3 | 12 | 50 |
| 2. S.A.Q | 13 | 4 | 17 | 100 |
| 3. Hospital Records | 14 | 3 | 17 | 108 |
| Total | 36 | 10 | 46 | 258 |

Table 48: Acute and Persistent Diarrhoea Cases

| Diarrhoea | Itala | Estate | Total |
|---|---|---|---|
| 1. Acute | 9 | 4 | 13 |
| 2. Persistent | 4 | 0 | 4 |
| Total | 13 | 4 | 17 |

Diarrhoea prevalence in both residential areas was a problem. The three samples of 50 , 100

and 108 children from the focus group discussions (FGD), self-administered questionnaires (SAQ) and hospital records accounted for 12, 17 and 17 cases respectively. This represents a prevalence rate of about 170 per 1000 children which in the district was considered very high. Table 47 and 48 show Itala Village had higher figures than the housing Estate. This is probably due to poor sanitary conditions and KAP.

### 5.3 Ability For Diarrhoea Control

The families' ability to control diarrhoea was based on the parents' KAP, socio-economic, demographic, educational and health background characteristics. Some families had the ability and others did not.

Ability based on possession of knowledge showed wide variation. For the respondents who lacked it a significant number could not define the disease - 28 % , a notable number did not know that water - 11% and food - 11% transmit diarrhoea and a large number did not know measles or malaria were contributory factors - 77 % and that food allergies were a cause - 65%. Probably due to lack of exposure to diarrhoea education a notable number were not aware that diarrhoea cases needed to feed normally - 23% and take medicines - 10 % and that children needed to be kept clean - 13% and given safe food - 22%. However, most families with ability gave salt-sugar solution - 96%, took cases to hospital - 94%, used safe drinking water - 93% and served safe fruit - 94%

Itala Village had more respondents than the Housing Estate who lacked ability on the basis of knowledge. A notable number could not define diarrhoea [Table 17] , did not know that water and food transmit diarrhoea [Tables 18 and 22] and that their children with diarrhoea

needed to feed normally [Table 23]. Both residential areas had about an equal number of respondents who did not know that measles or malaria were contributing factors to diarrhoea [Table 19], food allergy caused it [Table 21], medicines were to be taken to cure it [Table 25], children had to be kept clean to prevent it [Table 34] and needed safe food [Tables 43 and 44]. However, respondents in both residential areas had ability in taking cases to hospital [Table 26] and use of safe drinking water [Table 40], safe fruit [Table 44] and salt-sugar solution [Table 24].

Ability based on possession of the right attitude to diarrhoea disease showed great consistency with the required norm. 97% considered it dangerous and equally 97% complied with health advice. Both residential zones reflected equal ability on the basis of this parameter [Tables 28 and 29].

The strategy of practices against diarrhoea shows respondents either possessed or lacked ability. For those who had, 99% had latrines [Table 35] ,93% washed their hands always after using a toilet [Table 31], 91% washed fruit always before a child ate it [Table32] and 95% used safe water [Table 41]. Itala Village depended entirely on dry sanitation and the Housing Estate water closets. For respondents without ability there was a greater number in Itala Village than the Estates using unsafe water, serving their children unwashed fruit and not washing their hands always after using a toilet.

Ability based on the possession of the socio-economic situation showed a dichotomy between income and religion. The majority of respondents - 72 % lacked such ability as they earned less than K210,000 per month necessary for life sustenance in Zambia at December 1997 prices [Table11]. Many of the respondents were ordinary workers - 71% [Table 10] and

nearly all were Christian - 99% [Table9]. Income in kind seemed to complement regular income rather than supplement it [Table12]. Both residential areas had a negligible number of respondents with ability based on income and religion played only an appeasing social role. Non- availability of funds, however, contributes to the existence of malnutrition among children and indiscriminate behaviour among adults. These combined, play a vicious role in promoting diarrhoea, especially among children aged one to five years.

Ability based on the demographic situation concerned the age, sex, marital status, household headship, family size and relationship to children of the respondents. For those who lacked ability due to this parameter, 25% were too young to have adequate KAP {table 2], 53% managed too big families for their resources [Table 8], and 25% were not biological parents to emotionally and passionately care for their children [Table 6]. However, most respondents had ability based on their being female - 82% [Table 3], married - 91 % [Table 4] and belonging to male-headed households - 90% [Table 5].

Itala Village had more respondents - 16 than the Housing Estate - 8 who lacked ability on the basis of age. On the other hand the Housing Estate - 28 had more respondents than Itala Village - 25 who lacked ability on the basis of a big family. Further, the Housing Estate - 14 also had more respondents than Itala Village - 10 who lacked ability on the basis of biological parentage. However, Itala Village had more respondents - 45 than the Housing Estate -37 who had ability on the basis of their sex. On the other hand the Housing Estate - 48 had more respondents than Itala village - 43 with ability based on marital status and similarly that based on male headship of households was 46 and 44 respectively.

Ability based on the level of formal education attained by the respondents showed variation between primary and college education [Table 7]. For respondents who lacked ability there were 37% of primary schooling and for those with ability there were 63% secondary and college.

Itala Village - 29, had more respondents of primary education than the Housing Estate - 8. However, the Housing Estate - 42 had more respondents of secondary and college education than Itala Village - 21.

Ability based on the health background situation does not support the positive characteristics the respondents have. All water sources were unsafe [Table 42]. 34% of the children's stool specimen was infectious [Table14]; this provided a source or reservoir of infection. 19% of the respondents managed without refuse pits [Table 36]. The majority of households were infested with houseflies and cockroaches - conveyors of diarrhoea [Table 37 and 38]. The available refuse pits and latrines were not scientifically managed and became fly-breeding grounds and sources of contamination for underground water respectively [Table 39]. These factors together with highlevels of malaria - 42 % [Table 20] and malnutrition - 71 % [Table 45] could account for the high diarrhoea prevalence and reduction in families' ability to control it. Bahr et al say that malnourished children have more diarrhoea episodes than the normal (25).

**5.4 Link Between Diarrhoea Prevalence And Environmental Control measures**

The link between diarrhoea prevalence and environmental control measures has been established by the methods of spread and families' ability to control it. The results of water

samples, sanitation survey, children 's stool specimen, and KAP indicate that diarrhoea is spread by water, food, houseflies, and cockroaches and so adverse KAP, socio-economic, demographic, educational and health background facilitate its spread. The extent of the presence or absence of interventions, therefore, accounts for the level of diarrhoea prevalence.

**5.5 Verifying Hypotheses**

The underlying questions are whether there is a difference between the parent with KAP or better socio-economic situation or with both of these and parent without these characteristics and collectively whether or not there is a difference between the Housing Estate and Itala Village. The hypotheses are clarified as follows:

In the test of significance to test association of diarrhoea prevalence with knowledge it was established that knowledge alone cannot be associated with low prevalence of diarrhoea. The $X^2$ statistical test gave a P value of $P = 0.6544$ at 95% confidence interval ( CI ). The results therefore are not significant, meaning the parent's knowledge alone cannot determine whether a child can or cannot contract diarrhoea.

A $X^2$ test of significance was also done on parent's attitude and prevalence of diarrhoea. The results show that there is a significant statistical association between attitude and prevalence of diarrhoea at P value = 0.0134 ($X^2 = 6.11$ at 95% CI ). There is therefore a relationship between attitude and prevalence of diarrhoea.

The test of significance was also done on parent's practice and prevalence of diarrhoea. The

result showed that there was no association between practice and prevalence of diarrhoea at P value = 0.462 ($X^2$ = 2.57, df =3, and 95% CI ).

Comparisons between Mkushi Housing Estate and Itala Village gave the following results on KAP :

Table 49 : KAP P values of Housing Estate and Itala Village

| | P values | |
|---|---|---|
| Characteristics | Estate | Itala |
| Knowledge | 0.523473 | 0.81268849 |
| Attitude | 0.11785090 | 0.00257930* |
| Practice | 0.3670735 | 0.03879086* |

Note: * means statistical significance

From table 49 it clearly shows that there was a relationship between prevalence of diarrhoea and characteristics of attitude and practice in Itala Village unlike in Mkushi Housing Estate where there was no relationship between KAP and prevalence of diarrhoea.

The characteristic of income, however, does not seem to have a statistical association with diarrhoea prevalence in the two areas of Itala and Housing Estate. The $X^2$ statistical test gave a P value of 0.458372. The $X^2$ = 36.22, df = 36 at 95% CI.

The comparison between Mkushi Housing Estate and Itala Village gave the following results on income:

Table 50 : Income P values of Housing Estate and Itala Village

| Charecteristic | P values | |
|---|---|---|
| | Estate | Itala |
| Income | 0.093137* | 0.627114 |

Note : For the Estate $X^2 = 31.15$, df =22 at 95% CI and for Itala $X^2 = 18.34$, df = 21 at 95% CI. * means statistical significance.

From table 50 income does have an influence on prevalence of diarrhoea in the Housing Estate at P value P = 0.093137 as opposed to Itala where it seems to have no influence. This shows that income might not be a good measure of diarrhoea prevalence as the case is in the Estate, given that 6% of the people in the sample earn more than K200,000 and the rest are in the low income grouping. This is a clear case of income not being normally distributed in this area as indicated by data.

In Mkushi District Itala Village is a low income area. The statistical tests have shown that their attitude and practices have a relationship with high prevalence of diarrhoea. It is therefore observed that low income has a relationship with high prevalence of diarrhoea.

# CHAPTER 6 : IMPLICATIONS, CONCLUSION AND RECOMMENDATIONS

## 6.1 Implications

The existence of diarrhoea to the level of 170/1000 is clear proof that malnutrition, malaria and water infections are creating havoc. This is a major contributing factor to increasing mortality among children.

The non-existence of a school in Itala Village has dramatically reflected on knowledge attitude and practice towards case definition and cause of diarrhoea. From the very beginning if schools and health services were strengthened then perhaps the detrimental effect of this alarming situation could not have arisen.

The current level of diarrhoea prevalence could be attributed to the non- chlorination of piped water supplies and water wells and the use of alternative sources during the rainy season - i.e. water near homes and Chibefwe river [Table 42]. Otherwise increased use of environmental control measures lowers diarrhoea prevalence and reduced use brings about the opposite trend (34).

Emphasis is on the current level because even if the water source was chlorinated it is not possible to over- rule diarrhoea for in modern times factors contributing to it include contamination of water, existence of HIV infection and existence of cryptosporidium in water supplies. Paul Kelly and Baboo et al in their recent study conducted in George Compound, Lusaka, have attributed diarrhoea in children to cryptosporidium existing in George Compound water supplies (22). In another study Chintu and Luo et al have attributed

HIV infection to be one of the major causes of diarrhoea among young children in Lusaka City (35).

For environmental control strategies to succeed appropriate policies needed to be employed. The absence of the council environmental health technician and DAPP had an impact on the effect of these strategies. Perhaps this is a reflection of inadequate government and donor revenue base though both MOH and DAPP had good policies in the areas of food hygiene, water supply, sanitation, diarrhoea case management, funding, community mobilisation and health education.

The non-existence of a diarrhoea management unit at the hospital reflects under-staffing. Diarrhoea prevalence and low level KAP reflect inadequate health education or community mobilisation and this could explain why piped water was never boiled because it was regarded safe. The higher diarrhoea prevalence and more respondents lacking ability in Itala than the Estate and health background not conferring ability to those who have in both residential areas suggest the existence of such a situation throughout Mkushi District specifically and Zambia generally.

Initially Mkushi District made a very bright start through donor input and community participation. It was expected with combined interventions of safe water, refuse and excreta disposal and health education the health of the people especially children would be better off by the year 2000. Incidentally this desired effect failed to reach its target somehow. It looks like economic constraints are gaining faster than the implementation of interventions which have been revealed in the study. Good sanitation alone is not the answer for better health

status in children. The 1997 Central Board of Health report has very clearly stated that combined interventions implemented simultaneously are far better than individual interventions [36 ].

## 6.2 Conclusion

The study was done to assess diarrhoea prevalence among children aged one to five years and the families' ability to implement and or support environmental control measures that reduce diarrhoea incidence in this age group in Itala Village and Mkushi Housing Estate. The questions put forward at the beginning of this work seem to have been answered. The following facts were established;

* Diarrhoea prevalence was 170 per 1000 children and this was very high;
* The intervention programmes being executed by government and non-governmental organisations had a partial impact on the community;
* The children were experiencing both infectious and non-infectious type of diarrhoea;
* The government and non-governmental organisations intervention programmes were faulty - both pulled out of Itala;
* Some parents lacked KAP because they were either illiterates or migrants who had not been exposed to intervention programmes or were programme dropouts who neglected themselves or were affected by DAPP's action to pull out of the Village; and
* The majority of parents had large families, small incomes and unclean homes.

It was also established that there were great efforts to reduce diarrhoea prevalence through improving parents' KAP in the aspects of food hygiene, water supply, sanitation, diarrhoea case management and health education though funding was a problem. Inspite of these good

achievements there were policy environmental health and management deficiencies. Ideally the health sector policy was positive but effectively negative as DAPP and the Council environmental health sectors had pulled out and the curative and preventive health services remained improperly linked.

Concerning the environmental health aspect, most houses in Itala Village were unplanned temporary structures [Appendix xiii]. Its population was growing faster than that of the Housing Estate; incomes were low; overcrowding was common; housefly and cockroach infestations were at critical levels; latrine sanitation required attention and an increased number of safe water supply points with piped water chlorinated were needed.

Traditional and religious feeding customs in Itala needed to change. Beer and tobacco taking habits reduced incomes and prohibition of some foods negated nutrition for children's health and needed attention. Firewood and charcoal fuel appeared to be affecting boiling of drinking water and cooking in general; tree cover around the village has been cleared [Appendix xiii]. This needs research.

Diarrhoea ranked highest among the disease problems which included malaria. Causes were either direct or indirect and included contaminated food and water, sanitation, flies and bad personal hygiene. Illiteracy and lack of health education intensified diarrhoea prevalence.

In the aspect of diarrhoea management the respondents lacked knowledge on definition of the disease, water and food as diarrhoea conveyors and measles or malaria as factors for diarrhoea. They also lacked knowledge on feeding a diarrhoea case normally, use of medicines, keeping children clean and use of safe food.

This study also established the presence of factors that promote diarrhoea; these include, with very high prevalences, malaria - 42% and malnutrition - 71%. There were also problems of early motherhood, little income, big families, illiteracy or less schooling, damp environmental conditions and migration as indirect contributors.

DAPP activities started in Itala Village in 1990 to provide proper sanitation [ i.e. water, refuse and excreta disposal facilities] whereas the local authority provided good housing facilities and sanitation in the Estate. None of the organisers thought of implementing nutrition activities, education for knowledge and good health services for health. All these activities are linked with each other. No one activity can succeed in isolation.

**6.3 Recommendations**

The study has brought out some very important components which could be major contributing factors for the existence of serious diarrhoea in both Itala and Estate areas. This is because it did not look at certain contributing factors of diarrhoea like HIV infection, cryptosporidium and behaviour pattern of people in this area. Detailed investigation could not be made due to shortage of time and adequate funding.

The problem of diarrhoea and role played by people is very complex. This complexity has appeared because of imbalance between supply and demand; the number of providers and helpers is far below to meet the demands of many hungry mouths. In order to bring about a compromise between living standards and elimination of diseases, certain important factors would require immediate attention not only in Mkushi District but throughout the country of Zambia.

If standards of living could be improved and if people could have enough money to spend,

this could be the best option. People have been apprehending this for a long time which never became a reality. In its absence there is an urgent need to implement cost- effective measures. It is postulated protected water supply in the form of tap and well water should be adequately chlorinated and boiled when necessary and could bring down the prevalence of diarrhoea by 10%. It has been sufficiently proved and believed that environmental sanitation which includes proper housing, refuse and excreta disposal would lower the prevalence of diarrhoea further if people would religiously use pit latrines, discard their garbage in bins and acquire fairly good housing facilities.

The continuity and maintenance of proper water supply and environmental conditions can only be maintained if people had proper knowledge. Therefore, there is urgent need to establish proper schools both for child and adult education. This can be acquired by government, donor, and community input which is sustainable.

Lastly, it is of primary importance to maintain the health of the people, be it a child or an adult.None of these two components individually can remain healthy if the other is unhealthy. Health of the parents is important to give good care of the child, specifically within the age group of one to five years. This one factor can only be achieved by government input. and community participation.

The Government , through its health reforms promised its people equity in the distribution of health facilities, guaranteeing affordability which could be acquired with minimum cost. Hence the need to have at least a twenty bed health centre to cater for the needs of Itala Village and Housing Estate.

Finally the work of this research would not have any impact to an evaluator if it did not make a good finishing. In its final recommendations, therefore, it is suggesting with emphasis that there is an urgent need to improve health, education, nutrition, environment and sanitation. Implementation of any one of these interventions individually at different times will not fulfil the demands of the people. However, if all the interventions as has been mentioned earlier could be implemented at the same time then the target of 1% instead of 4% in bringing down diarrhoea prevalence could be achieved. The success of combined interventions implemented at the same time have been proved by the studies of HIV and AIDS in Uganda and Thailand

The above recommendations are the least the people of Mkushi District can demand to see the light of the day and believe the non- existence of diarrhoea and relieve themselves and their children from its detrimental effects.

### 6.4 Limitations of the Study

The short period of execution of three months, level of funding, long distances in the district and high cost for staff and transport prevented drawing of a large sample to cover the whole district and limited the work to a case study. The only weakness was that the short period of execution did not permit the repetition of biological tests to ensure validity.

### 6.5 Cost

The estimated cost was K1,700, 000. The actual cost is K2, 678,451.95

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## APPENDICES

### (i) Budget

The summary of the work programme and completion certificate is as follows;

| Item | | Work programme ( K ) | Completion certificate (K) |
|---|---|---|---|
| (a) Materials | ; | 440,900.00 | 470,900.00 |
| (b) Labour | ; | 648,000.00 | 566,451.95 |
| (c) Transport | ; | 170,000.00 | 330,000.00 |
| (d) Sundries | ; | 441,100.00 | 1,331,100.00 |
| Total Cost | ; | 1,700,000.00 | 2,678,451,95 |

### (ii) Time Table

| Period | | Activity |
|---|---|---|
| 1. April - August 1997 | - | Prepare Research Protocol |
| 2. September 1997 | - | Pilot - test questionnaire |
| | - | Seek Council Secretary's and District Medical Officer's permission to proceed with the research |
| 3. July - November 1997 | - | Seek funds from the Ministry of Health |
| 4. January - February 1998 | - | Execute research protocol i.e. - |
| | - | Prepare research assistants, materials, transport and sundries |
| | - | Collect data and analyse |
| | - | Write report |

5. February - March 1998 - Present report

**(iii) Diarrhoea Review Records**

- Outpatient Register

- Inpatient Register

APPENDIX (iv) **SELF ADMINISTERED QUESTIONNAIRE FOR DIARRHOEA INCIDENCE AND KAP INVESTIGATION AMONG CHILDREN AGED 1 - 5 YEARS AND THEIR MOTHERS IN ITALA VILLAGE AND MKUSHI ESTATE.**

---

**INSTRUCTIONS:**

(a) You are asked to answer all the questions freely in the way you know them

(b) Do not write your name on this question paper so that you are not known

(c) Tick against the correct answer or write as asked

**SECTION A : QUESTIONS ON PERSONAL INFORMATION**

Age of Height of Weight of

1. Area where you live: .....child: .....child: ..... Child: .....
2. The head of your household is; 1 Male: ..... 2.Female: .....
3. You are 1. Male: .....2 female: .....
4. You are to the child: 1 Mother: ..... 2 Father: .....3 Guardian:.....
5. Your age is: ..... Years; Your date of birth is: .....
6. When did you come into this area? Month: ..... Year:.....
7. You went to school and finished: 1.Primary:.....2. Secondary:.....3.College .....
8. You are: 1. Christian:.....2. Moslem: .....3. Non-religious:.....
9. Are you: 1. Single:..... 2. Married: .....3. Widowed: .....
10 Number of Children living with you: .....
11 Number of people living with you: .....
12 To get money, you and your husband either; 1 Work: ..... 2Farm.....
3. Do business: .....
13 From the work of Business or Farm, how much money do you make every month? K.....
14 Which of these do you have? 1. Maize:.....2.Beans:.....3.Cattle: .....
4. Chickens: .....5 Goats: .....6etc .....

## SECTION B: QUESTIONS ON KNOWLEDGE

15. Diarrhoea in children is passing watery stool;

1. Once in 24 hours: .....2 Twice in 24 hours: .....3.Three times or more in 24 hours: .....

16.

| Diarrhoea is caused by | Yes | No | Don't Know |
|---|---|---|---|
| 1. Drinking dirty water | | | |
| 2. Suffering from measles or malaria | | | |
| 3. The body not liking certain foods | | | |
| 4. Witchcraft | | | |
| 5. Spirit of the person after whom the child is named | | | |
| 6. Eating dirty food | | | |
| 7. Handwashing by mother | | | |
| 8. Handwashing by child | | | |

17.

| If your child has diarrhoea do you | Yes | No | Don't Know |
|---|---|---|---|
| 1. Starve it | | | |
| 2. Stop breast-feeding | | | |
| 3. Give nothing by mouth | | | |
| 4. Give water | | | |
| 5. Feed normally | | | |
| 6. Feed give salt-sugar solution | | | |
| 7. Give medicines | | | |
| 8. Take to hospital or health centre | | | |
| 9 . Take to traditional healer | | | |

18.

| You stop your child from getting diarrhoea by | Yes | No | Don't Know |
|---|---|---|---|
| 1. Keeping her/him clean all the time | | | |
| 2. Getting her/him drink boiled and cooled water whenever s/he needs drinking water | | | |
| 3. Getting her/him eat food while it is hot whenever s/he needs food. | | | |
| 4. Getting her/him eat fruit which has been washed in clean safe water whenever s/he needs fruit | | | |

**SECTION C: QUESTIONS ON ATTITUDES**

19. Do you think diarrhoea is a dangerous disease?
    1. Yes: ..... 2. No: .....
20. Health workers have been going round villages advising people how to prevent diarrhoea. Do you follow what they tell you?
    1. Yes..... 2.No: ... .....

**SECTION D: QUESTIONSON PRACTICE**

21. Has your child got diarrhoea now?
    1. Yes ..... 2. No.....

22. If yes to question 21, for how long?
    1. Less than 14 days .....2 for 14 days or longer .....

23. Has bloodslide and stoll been taken from your child ? 1. Yes ..... 2. No.....

24. You have a toilet? 1. Yes ..... 2. No ..

25. How often do you wash hands after using the toilet?
    1. Always:.....2. Never:.....3When remembered:.....4 Sometimes.....

26. How often do you wash fruit for your child before s/he eats them?
    1. Always:.....2.Never:.....3.When remebered: .....4.Sometimes:.....

27. Where do you get your water from?
    1. Well: ..... 2.Tap:..... 3. River: .....
28. You have a refuse Pit? 1. Yes ..... No.....

**Note:** We thank you very much for answering these questions in the way you know them.

APPENDIX (v) **FOCUS GROUP DISCUSSION QUESTIONNAIRE FOR DIARRHOEA INCIDENCE AND KAP INVESTIGATION AMONG MOTHERS OF CHILDREN AGED 1-5 YEARS IN ITALA VILLAGE AND MKUSHI HOUSING ESTATE**

---

**INSTRUCTIONS:**

(a) Six sessions will be held, three in Itala village and the other three in Mkushi Housing Estate

(b) The MPH student will moderate the discussions and the research assistant will tape record the mothers' contributions

(c) Each Focus group will have a maximum of ten (10) mothers at a session.

**SECTION A: QUESTIONS ON KNOWLEDGE**

1. What is diarrhoea?
2. How is diarrhoea caused?
3. What do you do when your child has diarrhoea?
4. How can you stop your child from getting diarrhoea?

**SECTION B: QUESTIONS ON ATTITUDES**

5. What danger does diarrhoea bring about?
6. Health Workers have been going round villages advising people how to prevent diarrhoea. What are you doing as follow up to their advice?

**SECTION C: QUESTIONS ON PRACTICE**

7. Has your child got diarrhoea now?
8. How often do you wash your hands after using the toilet?
9. How often do you wash fruit for your child/children before s/he (or they) eat(s) them?
10. Where do you get your water from?
11. How good is your toilet?
12. How good is your house
13. How clean is your house and surrounds?

## APPENDIX (vi) QUESTIONNAIRE FOR THE DISTRICT MEDICAL OFFICER AND THE DAPP REPRESENTATIVE ON DIARRHOEA INCIDENCE AND KAP INVESTIGATION AMONG MOTHERS OF CHILDREN AGED 1 - 5 YEARS IN ITALA VILLAGE AND MKUSHI HOUSING ESTATE

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1. In viewof the fact that Itala is an unplanned village, how is your organization assisting the people in terms of food secrurity (Quality storage or upkeep), water supply (Quality water), and sanitation (VIP toilets and refuse pits ie how many and how clean)? To what extent is your involvement in Mkushi Housing estate in this regard?

2. In the management of diarrhoea among children aged 1 - 5 years in Itala Village, what system is in place? What is the size of your diarrhoea management unit and who heads it? Is there any report on it referring to Itala village and Mkushi Housing Estate?

3. What is the method of funding your district?
   And what component do you allocate to diarrhoea control for the age group 1 - 5 years old with emphasis on health education?

4. How does the community respond to the Diarrhoea Disease control Programme? Could you clarify the roles you, NGOs, the political leadeship, and the church play in the programme?

5. What system of health education is in place, and what facilities and work plan are available for it? Is there linkage between the curative and preventive health services in this programme?

## APPENDIX (vii) CHECKLIST FOR ENVIRONMENTAL HEALTH SURVEY

1. District: .....
2. Chiefdom: .....
3. Name of Area: .....
4. Name of Neighbourhood Chairman: .....
5. Location of Itala village and Mkushi Housing Estate: See Map .....
6. Communications:

| System | Itala Village | Mkushi Housing Estate |
|---|---|---|
| Road | ..... | ..... |
| **System** | **Itala Village** | **Mkushi Housing Estate** |
| Railway | ..... | ..... |
| Radio/television | ..... | ..... |
| Telephone | ..... | ..... |
| Mail services | ..... | ..... |
| Nearest Town | ..... | ..... |

7. Date visited:
   Itala village: ..... Mkushi Housing Estate: .....
8. People consulted:
   Itala village: .....
   Mkushi Housing Estate: .....
9. Name of Assessor:
   Itala Village: .....
   Mkushi Housing Estate: .....

10. Soil:

| Variable | | Itala Village | Mkushi Housing Estate |
|---|---|---|---|
| Suitability for vegetable growing: | Yes<br>No | | |
| Crops best for the soil: | | ..... | ..... |
| | | ..... | ..... |
| | | ..... | ..... |
| | | ..... | ..... |
| | | ..... | ..... |
| | | ..... | ..... |

11. Climate:

| Itala Village | | | | Mkushi Housing Estate | | | |
|---|---|---|---|---|---|---|---|
| Rainfall | Temp Summer | Winter | Relative Humidity | Rainfall | Temp Summer | Winter | Relative Humidity |
| ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

12. Vegetation and Crops

| | Itala Village | Mkushi Housing Estate |
|---|---|---|
| Crops grown: | ..... | ..... |
| | ..... | ..... |
| | ..... | ..... |
| | ..... | ..... |
| | ..... | ..... |
| | ..... | ..... |
| Crops exported: | ..... | ..... |
| | ..... | ..... |
| | ..... | ..... |
| | ..... | ..... |
| | ..... | ..... |
| | ..... | ..... |

13. Housing

| | Itala village | Mkushi housing Estate |
|---|---|---|
| Type of Houses: | ..... | ..... |
| Quality of house (ie No of rooms) | ..... | ..... |
| Numbers of people per room | ..... | ..... |

14. Evidence ofpests:

| | Itala Village | Mkushi Housing Estate |
|---|---|---|
| House flies | ..... | ..... |
| Cockroaches | ..... | ..... |

15. Water supplies and Sanitation

| | Water supply | | | | Sanitation | |
|---|---|---|---|---|---|---|
| | Piped | Quality | No wells | Protected Wells | No Lat. | No Reg pits |
| Itala village | ..... | ..... | ..... | ..... | ..... | ..... |
| Mkushi Housing Estate | ..... | ..... | ..... | ..... | ..... | ..... |
| School in Itala | ..... | ..... | ..... | ..... | ..... | ..... |
| Schools in Estate | ..... | ..... | ..... | ..... | ..... | ..... |
| Market In Itala | ..... | ..... | ..... | ..... | ..... | ..... |
| Market In Estate | ..... | ..... | ..... | ..... | ..... | ..... |
| Public Latrines | ..... | ..... | ..... | ..... | ..... | ..... |
| Butcheries | ..... | ..... | ..... | ..... | ..... | ..... |
| Bars | ..... | ..... | ..... | ..... | ..... | ..... |
| Restaurants | ..... | ..... | ..... | ..... | ..... | ..... |

16. Population:

| | Total | Infants | 1-5yrs | 6-14yrs | Yong men | Migrants | Main Language |
|---|---|---|---|---|---|---|---|
| Itala Village | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Mkushi Housing Estate..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

17. Occupation:

| | Sub Farm | Comm Farm | Hand crafts | Work shops | merchandise shops | Formal Employment |
|---|---|---|---|---|---|---|
| Itala Village | ..... | ..... | ..... | ..... | ..... | ..... |
| Mkushi Housing Estate | ..... | ..... | ..... | ..... | ..... | ..... |

18. Social Organisation and Family Life:

| Variable | Itala Village | Mkushi Housing Estate |
|---|---|---|
| - People's Normal Daily routine: | ..... | ..... |
| - Times when people would be most Likely to attend health education talks | ..... | ..... |

- Type of families - Extended : ..... .....
  Nuclear : ..... .....
- Head of household Usually present : ..... .....
  Usually absent : ..... .....
- Friends and relatives whether or not living with them : ..... .....

19. Political Organisation:

| Variable | Itala Village | Mkushi Housing Estate |
|---|---|---|
| - Traditional Leadership: | ..... | ..... |
| - Conventional Leadership: | ..... | ..... |
| - Others with Influence: | ..... | ..... |
| - Power Groupings based on interest: | ..... | ..... |

20. Beliefs and Traditions:

| Variable | Itala village | Mkushi Housing Estate |
|---|---|---|
| - Religious: | ..... | ..... |
| - Traditional beliefs Related to health and disease: | ..... | ..... |
| | ..... | ..... |
| | ..... | ..... |
| | ..... | ..... |
| | ..... | ..... |
| - Herbalists: | ..... | ..... |
| - Witchdoctors: | ..... | ..... |

21. Nutrition:

| Variable | | Itala Village | Mkushi Housing Estate |
|---|---|---|---|
| - Types of food eaten: | Carbohydrates: | ..... | ..... |
| | Proteins | ..... | ..... |
| | Protective | ..... | ..... |
| | Beverages | ..... | ..... |
| - Source of food: | Local gardens: | ..... | ..... |
| | Market : | ..... | ..... |
| | Shops : | ..... | ..... |
| - Number of Vegetable gardens : | | ..... | ..... |
| - Availability of food in Summer : | | ..... | ..... |
| | Winter : | ..... | ..... |
| - Feeding Customs in the family : | | | |
| | Food prohibitions : | ..... | ..... |
| | Bottle feeding : | ..... | ..... |
| | Alcohol Consumption : | ..... | ..... |
| | Tobacco Consumption: | ..... | ..... |
| | Cooking Methods : | ..... | ..... |
| | Eaten hot : | ..... | ..... |
| | Eaten cold : | ..... | ..... |

22. Health of the Community:

| Variable | Itala Village | Mkushi Husing Estate |
|---|---|---|
| - Main disease problems as stated by the local people | ..... | ..... |
| - Main disease problems as stated by hospital records | ..... | ..... |
| | ..... | ..... |
| - Season diseases | ..... | ..... |

- Attitude of the people towards health services

- Felt needs of the people regarding health problems

- What outsiders and professionals think the needs are:

- Possible causes of diseases in the two places

23. Education:

| Variable | Itala Village | Mkushi Housing Estate |
|---|---|---|
| - Level of education of women: | ..... | ..... |
| - Level of education of men: | ..... | ..... |
| - Schools | ..... | ..... |
| - Attitude to learning: | ..... | ..... |

24. Groups and Organizations in the Community:

| Variable | Itala Village | Mkushi Housing Estate |
|---|---|---|
| - Government department directly related to health: | ..... | ..... |
| - Government departments that can be of help to health services such as | ..... | ..... |

| | | |
|---|---|---|
| Agricultural extension Community Development | ..... | ..... |
| | ..... | ..... |
| - Voluntary groups, such as local nutrition groups, Red Cross, NGOs | ..... | ..... |
| | ..... | ..... |
| - Local church related organisations: | ..... | ..... |
| - Local clubs | ..... | ..... |
| - Other groups | ..... | ..... |

25. Changes already taking place in the Community:

| **Variable** | **Itala Village** | **Mkushi Housing Estate** |
|---|---|---|
| - History of the Community: | ..... | ..... |
| | ..... | ..... |
| | ..... | ..... |
| | ..... | ..... |
| - Development Projects completed | ..... | ..... |
| | ..... | ..... |
| | ..... | ..... |
| | ..... | ..... |
| - Effects of Development projects | ..... | ..... |
| | ..... | ..... |
| | ..... | ..... |
| | ..... | ..... |
| - Development projects planned | ..... | ..... |
| | ..... | ..... |
| | ..... | ..... |
| | ..... | ..... |
| - Other changes | ..... | ..... |
| | ..... | ..... |

**APPENDIX (viii) MEDICAL ENTOMOLOGICAL SURVEY**

DISTRICT :.....

CHIEFDOM :.....

| Variable | Itala Village | Mkushi Housing Estate |
|---|---|---|
| 1. Situation | | |
| - Total number of Latrines: | ..... | ..... |
| - No of waterborne Latrines: | ..... | ..... |
| - Condition f Wb/Latrines: | ..... | ..... |
| - No of Dry Latrines: | ..... | ..... |
| - Condition of Dry Latrines: | ..... | ..... |
| - Number of Dry Latrines sampled (ie treated with insecticide) | ..... | ..... |
| - Average Number of insects found dead in each Latrine | Flies Roaches<br>..... ..... | Flies Roaches<br>..... ..... |

| 2. Housing | Itala Village | Mkushi Housing Estate |
|---|---|---|
| - Total Number of houses: | ..... | ..... |
| - Number of houses sampled: | ..... | ..... |
| - Evidence of infestation from sample; House flies: | ..... | ..... |
| Cockroaches: | ..... | ..... |
| - Separate Kitchens with infestation: House flies: | ..... | ..... |
| Cockroaches: | ..... | ..... |

| 3. Refuse Disposal<br>Variable | Itala Village | Mkushi Housing Estate |
|---|---|---|
| - Is there provision of controlled Refuse tipping?: Yes: | ..... | ..... |
| No | ..... | ..... |
| - If Yes/No, what method of Refuse disposal is used? | ..... | ..... |

- Does the refuse disposal method attract fly breeding? Yes: ..... .....

No : ..... .....

- What method can be applied to stop fly-breeding? ..... .....

- Is there any kraal nearby? Yes: ..... .....

N0: ..... .....

- Is it a source of fly-breeding? Yes: ..... .....

No: ..... .....

Other Remarks: .....

.....

.....

.....

**LIKERT SCALE: PROPORTION OF HOUSES WITH HOUSEFLIES AND COCKROACHES IN ITALA VILLAGE AND MKUSHI HOUSING EASTATE**

| FREQUENCY AND INTENSITY OF INFESTATION | DESCRIPTION | ITALA VILLAGE | | | | MKUSHI HOUSING ESTATE | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | HOUSE WITH HOUSE FLIES | | HOUSE WITH COCKROACHES | | HOUSE WITH HOUSE FLIES | | HOUSE WITH COCKROACHES | |
| | | NO | % | No | % | No | % | No | % |
| LEVEL 5 | Heavy Infestation - | | | | | | | | |
| LEVEL 4 | Critical Infestation - | | | | | | | | |
| LEVEL 3 | Moderate Infestation - | | | | | | | | |
| LEVEL 2 | Considerable Infestation - | | | | | | | | |
| LEVEL 1 | Light Infestation - | | | | | | | | |
| LEVEL 0 | None | | | | | | | | |
| | TOTAL | | | | | | | | |

**LIKERTSCALE: PROPORTION OF LATRINES WITH HOUSEFLIES AND COCKROACHES IN ITALA VILLAGE AND MKUSHI HOUSING ESTATE**

| FREQUENCY AND INTENSITY OF INFESTATION | DESCRIPTION | ITALA VILLAGE | | | | KUSHI HOUSING ESTATE | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | LATRINES WITH HOUSEFLIES | | LATRINES WITH COROACHES | | LATRINES WITH HOUSEFLIES | | LATRINES WITH COCKROACHES | |
| | | No | % | No | % | No | % | No | % |
| LEVEL 5 | Heavy Infestation | | | | | | | | |
| LEVEL 4 | Critical Infestation | | | | | | | | |
| LEVEL 3 | Moderate Infestation | | | | | | | | |
| LEVEL 2 | considerate Infestation | | | | | | | | |
| LEVEL 1 | Light Infestation | | | | | | | | |
| LEVEL O | None | | | | | | | | |
| | TOTAL | | | | | | | | |

APPENDIX (ix) PERMISSION TO PROCEED WITH RESEARCH

(a) To : District Director of Health/District Medical Officer;

UNIVERSITY OF ZAMBIA

Department of Community Medicine
School of Medicine
P.O. Box 50110
LUSAKA.

4th October 1997.

The Distirct Director of Health,
Mkushi District Health Management Board,
P.O. Box 840042,
**MKUSHI**

Dear Madam,

RE: **REQUEST FOR PERMISSION TO UNDERTAKE RESEARCH AT MKUSHI DISTRICT HOSPITAL**

This letter serves to request your permission to be granted to allow me collect data from you and the Hospital monthly returns of December 1997 relating to the topic mentioned here below.

My task is to assess the prevalence of diarrhoea in children aged one to five years and their families' ability to implement or support environmental control measures that reduce diarrhoea incidence in this age group in your district. This is part of my post-graduate study programme (i.e. Master of Public Health Degree).

Because of the constraints of time and funds.Iam unable to draw a sample to cover the whole district. Hence a case study of Itala village and Mkushi Housing Estate is being recommended. Your hospital is expected to hold all the data on patients from the two residential areas.

The Ministry of Health is funding this study. The results and recommendations, however, will be communicated to you and all other stakeholders. The recommendations are expected to benefit your district as a whole through extrapolation of the findings.

I thank you in advance for your valuable cooperation and look forward to receiving your favourable response.

Yours Sincerely,

**ALBERT S. NGULUWE**

(b) To: District Council Secretary;

UNIVERSITY OF ZAMBIA

Department of Community Medicine
School of Medicine
P.O. Box 50110
**LUSAKA**

4th October 1997

The Council Secretary,
Mkushi District Council,
P.O. Box 840001
**MKUSHI**

Dear Sir,

RE : **REQUEST FOR PERMISSION TO UNDERTAKE RESEARCH IN MKUSHI DISTRICT**

I write to request for permission to be granted to allow me undertake research in Itala village and Mkushi Housing Estate of your district from 15th December 1997 to March 31st 1998.

My task is to assess the prevalence of diarrhoea in children aged one to five years and their families' ability to implement or support environmental control measures that reduce diarrhoea incidence in this age group in your district. This is part of my post-graduate study programme (i.e. Master of Public Health Degree).

Because of the limitations of time and funds I am unable to draw a sample to cover the whole district . Hence a case study of Itala village and Mkushi Housing Estate is being recommended.

The Ministry of Health is funding this case study whose results and recommendations will be communicated to you and all other stakeholders. The recommendations are expected to benefit the district as a whole through extrapolation of the findings.

I thank you in advance for cooperating and look forward to receiving your favourable response.

Yours faithfully,

**ALBERT S. NGULUWE**

APPENDIX (x)

UNIVERSITY OF ZAMBIA

Department of community Medicine, School of Medicine,
P.O. Box 50110, LUSAKA

## INTERVIEWEE INFORMATION SHEET AND CONSENT

### 1. INFORMATION

We invite you to participate in our research which we believe will contribute greatly to knowing about diarrhoea prevalence in children aged 1 to 5 years and how to control or prevent it using environmental control methods. As such two simple questionnaires asking about knowledge, attitude, and practice have been prepared for you. One questionnaire will be answered individually and the other will be answered in group discussions. The self-administered questionnaire will take ten minutes of your time to answer and the group discussion questionnaire about 30 minutes. The answers to these questions will be treated with confidence and your name will not appear anywhere.

Your doctors looking after your child will take a bloodslide and stool specimen from your child if she or he is found ill to find out if she or he has malaria and the kind of diarrhoea. They will also weigh the child to find out if she or he is malnourished. Taking a bloodslide from the finger only causes some minor discomfort. However, this will enable them to treat your child better.

You have the right to withdraw or refuse to participate in the study before questions are asked of you or even during the time questions are being asked about your knowledge, attitude, and practice relating to diarrhoea control in the age group 1 to 5 years. Not agreeing to take part in the study will not affect the treatment or medication your child will take in any way.

Any information about your child and you will be treated in the strictest confidence and will not be able to be linked to you.

Thank you for your willigness to contribute.

MPH STUDENT: SIGNATURE:

2 CONSENT

The above information has been explained to me clearly and I fully understand and consent myself to participate in the research.

FULL NAME:.....

SIGNATURE:.....

WITNESS:.....

DATE:.....

APPENDIX (xi)

PERMISSION GRANTED

(a)

# MKUSHI DISTRICT COUNCIL

Civic Centre
P.O. Box 840001
MKUSHI

Tel.: 362178 / 362021
Fax No. 362178

All correspondence to be addressed to The Council Secretary

Our Ref :

Date : 10th December, 1997

Mr Albert S Nguluwe
University of Zambia
School of Medicine
P.O. Box 50110
LUSAKA.

Dear Sir

RE : PERMISSION TO UNDERTAKE RESEARCH IN MKUSHI DISTRICT.

The above subject refers.

Mkushi District Council is delighted to have students persuing higher degrees of your kind at higher institutions.

It is envisaged that through your research effort data obtained will be of great value to the District as a whole.

It is therefore with pleasure that you are given permission to go aheard with the intent.

God's Blessings

MKUSHI DISTRICT COUNCIL.

A K TEMBO
COUNCIL SECRETARY

# MINISTRY OF HEALTH

(b) MKUSHI DISTRICT HEALTH MANAGEMENT BOARD

P.O. BOX 840042,
MKUSHI

The Head of Institution,
Mkushi District Hospital,
P.O. Box 840042,
MKUSHI

RE: PERMISSION TO UNDERTAKE RESEARCH AT MKUSHI D. HOSPITAL

This is tointroduce to you Mr. A.S. Nguluwe who is a student (MPH) at the University of Zambia with Department of community Medicine.

He will need to undertake research at your hospital, and assess the prevalence of diarrhoea in children aged one to five years and their families, ability to implement or support environmental control measures that reduce enviromental control measures that reduce diarrhoea incidence in this age group in the district.

Please co-ordinate and co-operate with him and give him muximum assistance.

R C BANDA
ACTING DISTRICT DIRECTOR OF HEALTH
MKUSHI DISTRICT HEALTH MANAGEMENT BOARD

c.c .Mr. A.S. Nguluwe ✓

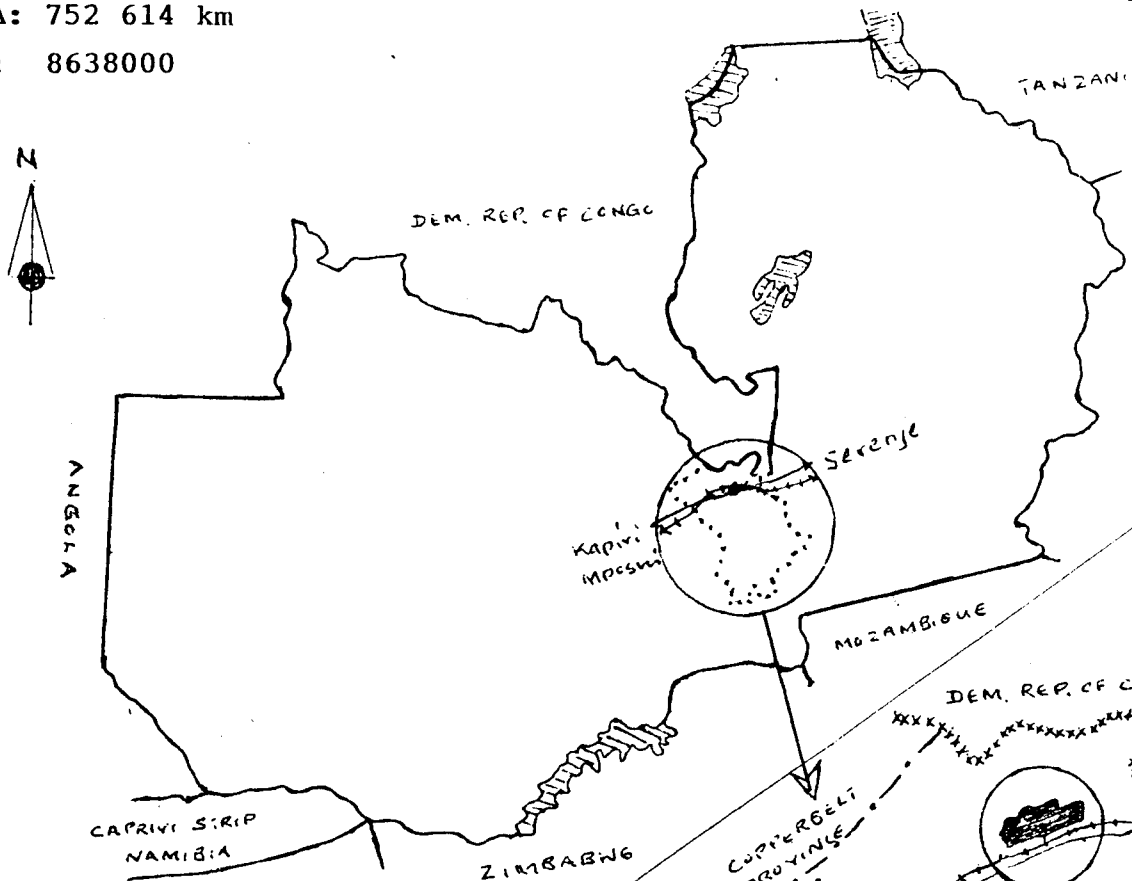
LOCATION OF ITALA VILLAGE AND MKUSHI HOUSING ESTATE

APPENDIX (x

MAP OF ZAMBIA

AREA: 752 614 km

POP: 8638000




MAP OF MKUSHI DISTRICT

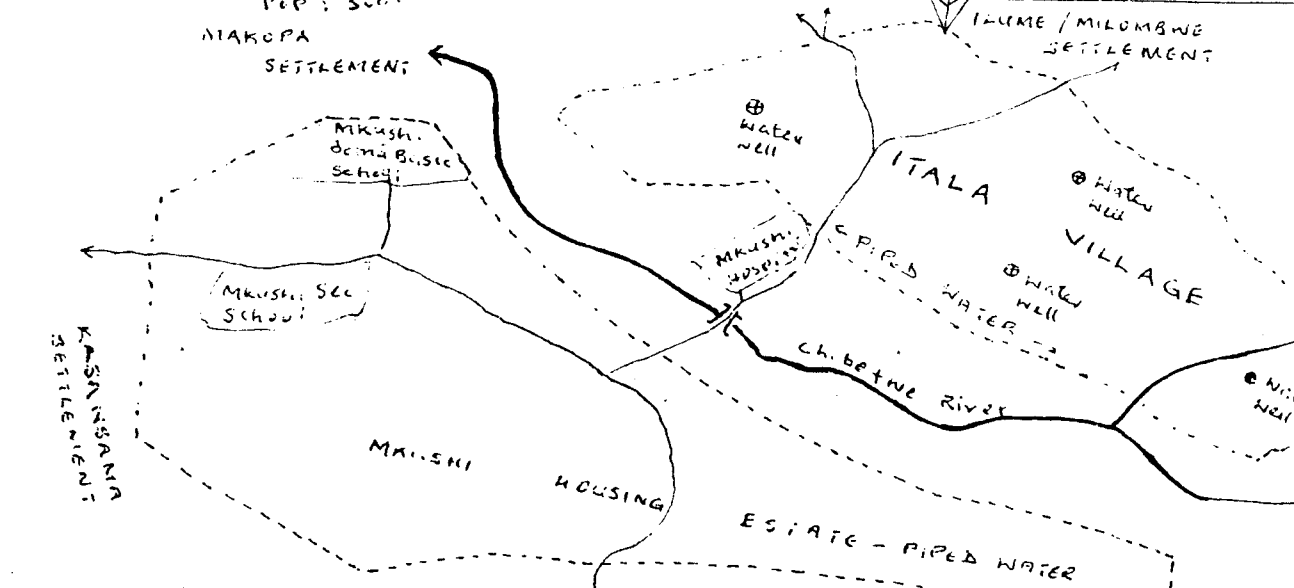
Area: 992 km²

Pop: 100,000

MAP OF ITALA VILLAGE AND MKUSHI HOUSING ESTATE

(a) Itala Village: Area: 2 km²
Pop: 3,000

(b) Mkushi Estate: Area: 3 km²
Pop: 3000



# THE UNIVERSITY OF ZAMBIA

**DIRECTORATE OF RESEARCH AND GRADUATE STUDIES**


Telephone: 252514/292884
Telegrams: UNZA LUSAKA
Telex: UNZALU ZA 44370
Fax: 260-1-253952

P.O. BOX 32379
Lusaka Zambia


Your Ref

Our Ref

23rd February 1998

Mr A S Nguluwe
Department of Community Medicine
School of Medicine
**U T H**

Dear Mr Nguluwe

**MASTER OF PUBLIC HEALTH PART I FINAL EXAMINATION RESULTS 1997/98**

On behalf of the Board of Graduate Studies of the Directorate of Research and Graduate Studies, I am pleased to inform you that you have satisfied the examiners for the requirements of Part I of Master of Public Health.

You can now proceed on to Part II of your programme.

**CONGRATULATIONS**

Yours sincerely

**Geoffrey Lungwangwa (Dr)**
**D I R E C T O R**

cc Assistant Dean (Postgraduate) - School of Medicine
Head - Department of Community Medicine

# The University of Zambia

**DIRECTORATE OF RESEARCH AND GRADUATE STUDIES**

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Fax: +260 - 1 - 253952/290258

P O Box 32379
Lusaka Zambia

Your Ref:
Our Ref:

5th August 1998

Mr Albert S. Nguluwe
Department of Paediatrics and Child Health
School of Medicine
**UNZA**

Dear Mr Nguluwe

I am pleased to inform you that the 34th meeting of the Board of Graduate Studies of 31st July, 1998 approved your research proposal entitled, ***"An Assessment of the Prevalence of Diarrhoea in Children Aged One to Five Years and the Families Ability to Implement or Support Environment Control Measures That Reduce Diarrhoea Incidence in this Age Group, Itale Village and Mkushi Housing Estate Mkushi District, Zambia."***

You can now proceed to Part II of your programme.

**CONGRATULATIONS**

Geoffrey Lungwangwa (Dr)
**DIRECTOR**

# The University of Zambia

## DIRECTORATE OF RESEARCH AND GRADUATE STUDIES


Telephone: 292884/290258
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Fax: + 260 - 1 - 253952/290258
E-mail DirectorPostgrad@postgrad.unza.zm

P O Box 32379
Lusaka, Zambia


Your Ref:
Our Ref:

9 December 1999

DR Albert Ngulube
C/O Department of Community Medicine
School of Medicine
**UNZA**

Dear Dr Ngulube

**RE: EXAMINATION RESULTS OF YOUR RE-SUBMITTED M.P.H DISSERTATION**

The examination results of your re-submitted M.P.H. dissertation was discussed at the 45th meeting of the Board of Graduate Studies. I am pleased to inform you that your dissertation entitled " **AN ASSESSMENT OF THE PREVALENCE OF DIARRHOEA IN CHILDREN AGED ONE TO FIVE YEARS AND THE FAMILIES' ABILITY TO IMPLEMENT OR SUPPORT ENVIRONMENTAL CONTROL MEASURES THAT REDUCE DIARRHOEA INCIDENCE IN THIS AGE GROUP IN ITALA VILLAGE AND MKUSHI HOUSING ESTATE, MKUSHI DISTRICT, ZAMBIA** " was passed with a PASS WITH MINOR CORRECTIONS.

You are required to attend to the minor corrections. Your supervisor should certify in writing that the corrections have been attended to before three bound copies of the dissertation are submitted to this office.

Yours sincerely

Geoffrey Lungwangwa (PhD)
**DIRECTOR**

cc Dean, School of Medicine
Head, Department of Community Medicine
Assistant Dean (Postgraduate), School Medicine

# THE UNIVERSITY OF ZAMBIA
## SCHOOL OF MEDICINE

Telephone: 252641
Telegram: UNZA, Lusaka
Telex: UNZALU ZA 44370

Fax: + 260-1-250753

Dean's Office
P.O. Box 50110
Lusaka, Zambia

Your Ref:
Our Ref:

11th February 2000-02-11

The Director
Directorate of Research and Graduate Studies
University of Zambia 32379
LUSAKA

Dear Sir

Re: **MINOR CORRECTIONS TO THE RE-SUBMITTED MPH DISSERTATION FOR MR ALBERT S NGULUWE**

Your letter of 9th December 1999 to the above named MPH student and copied to the Dean, School of Medicine in respect of the subject in heading refers.

The student has attended to the minor corrections and has been advised to submit three bound copies of his dissertation to your office as instructed.

Yours sincerely

Prof K S Baboo
PRINCIPAL SUPERVISOR/MPH COORDINATOR

cc. Assistant Dean (Postgraduate)
Head, Department of Community Medicine
Mr Albert S Nguluwe