

**KNOWLEDGE, ATTITUDE AND PRACTICES OF DISTRICT HEALTH PERSONNEL  
ABOUT NUTRITION SURVEILLANCE PROGRAMME IN ZAMBIA**

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A mini thesis submitted in partial fulfilment of the requirements for the degree of Magister Public  
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**KEYWORDS**

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Monitoring

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Indicators

Knowledge

Attitude

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## ABSTRACT

### **KNOWLEDGE, ATTITUDE AND PRACTICES OF DISTRICT HEALTH PERSONNEL ABOUT NUTRITION SURVEILLANCE PROGRAMME IN ZAMBIA**

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This study was aimed at identifying factors that are associated with the implementation of the nutrition surveillance programme in Zambia. The objective of the study was to determine the knowledge attitude and practice of district level health personnel about nutrition surveillance.

The study is a cross section descriptive study in which quantitative and qualitative data collection methods were used to collect data using questionnaire and focus group discussion. A total of 22 districts were selected proportionate to population size in each of the 9 provinces but only 21 districts participated in the study achieving a 95% district response rate. In each district, 5 health personnel working in the district on nutrition programmes and on information systems were recruited to participate in the study and only 102 participants were able to participate in the study. A self-administered questionnaire to determine their knowledge, attitudes and practices about nutrition surveillance was distributed to health personnel. Eight participants

who had positive responses about nutrition surveillance participated in the discussion to explore further their attitudes and practices about surveillance.

The study revealed that health personnel knew the components and purpose of nutrition surveillance. However, the focus group discussions revealed that the majority of personnel were frustrated by the fact that they could not interpret the data and therefore could not use it effectively to plan and implement interventions.

The information obtained in the study will be used to improve training and practices of health personnel about nutrition surveillance.

May 2005

## DECLARATION

I declare that *knowledge, attitude and practices of district health personnel about nutrition surveillance programme in Zambia* is my own work, that it has not been submitted before for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged as complete references.

Chipo Misondzi Mwela

May 2005

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

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## ABBREVIATIONS

<b>ACC-SCN</b>	Administrative Committee on Coordination-Sub Committee on Nutrition
<b>AIDS</b>	Acquired Immune Deficiency Syndrome
<b>ARTIS</b>	Anti Retroviral Therapy Information System
<b>CBOH</b>	Central Board of Health
<b>CDC</b>	Centre for Disease Control
<b>CSO</b>	Central Statistical Office
<b>DIFD</b>	Department of International Fund Development
<b>DHMT</b>	District Health Management Team
<b>DHS</b>	Demographic Health Survey
<b>EPI</b>	Extended Programme on Immunization
<b>FAO</b>	Food and Agriculture Organisation
<b>FHANIS</b>	Food Health and Nutrition Information System
<b>GRZ</b>	Government of the Republic of Zambia
<b>Hb</b>	Haemoglobin
<b>HIV</b>	Human Immune -deficiency Virus
<b>HKI</b>	Helen Keller International
<b>HMIS</b>	Health Management Information System
<b>HR</b>	Health Reforms
<b>MCH</b>	Maternal and Child Health
<b>MCTI</b>	Ministry of Commerce Trade and Industry
<b>MACO</b>	Ministry of Agriculture and Cooperatives
<b>MFED</b>	Ministry of Finance and Economic Development
<b>MOH</b>	Ministry of Health

<b>NCHS</b>	National Centre for Health Statistics
<b>NFNC</b>	National Food and Nutrition Commission
<b>NHSP</b>	National Health Strategic Plan
<b>NS</b>	Nutrition Surveillance
<b>NNSP</b>	National Nutrition Surveillance Programme
<b>PEM</b>	Protein Energy Malnutrition
<b>PHC</b>	Primary Health Care
<b>SCN</b>	Sub Committee on Nutrition
<b>SIDA</b>	Swedish International Development Agency
<b>STD</b>	Sexually Transmitted Disease
<b>UNICEF</b>	United Nations Children’s Fund
<b>USAID</b>	United States Agency for International Development
<b>US-CDC</b>	United States-Centre for Disease Control
<b>WHO</b>	World Health Organisation
<b>ZIHP</b>	Zambia Integrated Health Programme
<b>ZDHS</b>	Zambia Demographic Health Survey
<b>ZEN</b>	Zambia Enrolled Nurse

# CHAPTER 1

## 1.0 INTRODUCTION

In Zambia and other sub-Saharan countries, malnutrition is a public health problem. According to the Zambia Demographic Health Survey (ZDHS), 47% of children under the age of five years were reported to be moderately stunted (<-2 SD height for age), 22% severely stunted (<-3 SD height for age); 5% were wasted (<-2 SD weight for height) and 1% severely wasted (<-3 SD weight for height). Results for weight for age show that 28% of the children were underweight (<-2 SD weight for age) and 7% severely underweight (<-3 SD weight for age), (CSO *et al*, 2002).



According to the joint committee on nutrition, when the proportion of children under the age of 5 years with weight for age below 60<sup>th</sup> percentile is above 10%, means that the population has reached alarming levels that need intervention (FAO *et al*, 1976). In Zambia, the proportion of children's weight for age of 28% is 2.8 times above the trigger level. In this regard, the problem of malnutrition in Zambia is chronic and has reached epidemic levels. Nutrition surveillance is therefore imperative in Zambia.

The United States Centre for Disease Control and prevention (US-CDC) defines surveillance as 'the ongoing, systematic collection, analysis and interpretation of

health data essential to planning, implementation and evaluation of public health practice (CDC, 2001; Davids, 2001). A surveillance system may indicate the need for a special survey of particular problem. Nutrition surveillance, therefore, is used to make decisions which will lead to improvements in nutrition of the populations (Mason *et al*, 1984).

Surveillance of nutritional status of populations is one of the areas of great concern for international, national and technical organisations that work in the fields of food, agriculture and health. In 1974, the World Food Conference in Rome made specific recommendations that “a global nutritional surveillance system be established by FAO, WHO and UNICEF to monitor the food and nutrition conditions of the disadvantaged groups of the population at risk, and to provide a method of rapid and permanent assessment of all factors which influence food consumption patterns and nutrition status of populations (UN, 1974)”

The development of primary health care served as a global guideline for health services planning. In a holistic approach, the Primary Health Care (PHC) targets five principles of inter-sectoral primary prevention, preventive medicine and basic curative medicine focusing on the community level. The five principles are: equitable distribution of resources, community involvement, focus on prevention strategies, appropriate technology and multi-sectoral approach (Walt and Vaughan, 1981). In order to implement the PHC concept; staff capacity, district

health system and information systems are some of the essential tools needed for the successful implementation of the PHC concept.

In Zambia, the National Nutrition Surveillance Programme (NNSP) has now been integrated into the Health Management Information System (HMIS) as a response to the Health Reforms (Chishimba *et al*, 2003). The Health Reforms (HR) aims at providing “equity of access to cost effective health care services to as close to the family as possible (MOH, 1990).” The health reforms are a modified concept of the PHC. The two have supportive structures for information systems and monitoring of programmes.

## 1.1 BACKGROUND



### **National Nutrition Surveillance Programme in Zambia**

The National Nutrition Surveillance Programme (NNSP) was introduced in Zambia in 1960 as part of the Ministry of Health’s Maternal and Child Health (MCH) services (ZIHP, 2003). The focus of the programme was on anthropometric data (weight for age) collected at clinic level. This is what is currently known as growth monitoring and promotion (GMP). In 1975, the GMP programme was developed into the NNSP with the support from the Swedish International Development Agency (SIDA). The programme collected monthly data from children attending the children’s clinic, where other health services were provided. Data was collected from clinic level and sent to district office where it was aggregated. From the district office, it was sent to the provincial

office where it was aggregated for provincial use. Later it was sent to the national level, at the Nutrition Unit, where it was analysed and reports written for decision making. The same data was reported in the Health Information System of the Ministry of Health (MOH, 1991). The development of the health reforms in 1996 facilitated the integration of the NNSP into the Health Management Information System (HMIS).

### **The Health Management Information System**

The Health Management Information System (HMIS) was developed as a tool to monitor and evaluate the health services. This coincided with the development of the second National Health Strategic Plan that was implemented in 1998-2000 (MOH and CBOH, 1998).



Components of the HMIS are: the health status management and reporting, financial management, human resource management, drug management; and supplies and assets management (Chishimba *et al*, 2003). According to the first National Health Strategic Plan (NHSP), the goal of the HMIS was to establish a self sustaining monitoring and evaluation system. This was meant to improve decision-making at all levels of the health care system with timely, valid and appropriate information to increase the effective utilization of quality health services (Chishimba *et al*, 2003).”



|

The HMIS operates on four guiding principles:

- Decentralization (data analysis and self assessment is done at all levels),
- Action (data use at all levels for decision making),
- Responsive (should be flexible and timely); and
- Transparent (information must be user-friendly), (Chishimba *et al*, 2003).

Nutrition indicators such as anthropometric data, micronutrients data and associated malnutrition data are part of the HMIS. Reporting is done quarterly. Districts are required to use data at district level and forward the aggregated data to the central level, the Central Board of Health (CBOH).

## 1.2 RESEARCH PROBLEM



The National Nutrition Surveillance Programme was implemented from 1975 to 1991 as a tool for health development and planning. The integration of the surveillance programme into the health management information system took place in 1996 thereby reducing the visibility of nutrition programming and planning in the country. This has become a problem for nutrition programme planning because most indicators collected using the HMIS are not on nutrition indicators. As a result, there is limited use of nutrition data in the planning of nutrition programmes, policy formulation, programme management and evaluation. The reason for this is not clear. This research will explore the knowledge, attitude and practice of district health personnel about nutrition surveillance in Zambia.

### **1.3 RESEARCH QUESTIONS**

The questions asked were:

- Do district health personnel have the capacity to implement the nutrition surveillance?
- What is their attitude towards nutrition surveillance?

### **1.4 STUDY SIGNIFICANCE**

There is need therefore, to assess the knowledge, attitude and practice of district level staff, and determine factors that affect the implementation of the programme in order to make recommendations to the ministry of health as well as to the District Health Management Teams (DHMT). The findings from this study will be used to improve the implementation of the programme and delivery of nutrition interventions.

### **1.5 AIM**

The study is aimed at identifying factors which are associated with the implementation of the national nutrition surveillance programme among district health personnel in Zambia.

## 1.6 OBJECTIVES

The specific objectives of the study are:

1. To describe the process of implementing nutrition surveillance programme in Zambia.
2. To assess the knowledge of district health personnel about nutrition surveillance.
3. To explore the attitudes of district health personnel about nutrition surveillance.
4. To establish the practices of district health personnel about nutrition surveillance in Zambia.
5. To make recommendations that could assist programme management and information utilization in Zambia.



## CHAPTER 2

### LITERATURE REVIEW

#### 2.0 INTRODUCTION

This chapter defines what nutrition surveillance is, the different systems used in nutrition surveillance and what they intend to achieve. In addition, the literature review explores methods that have been used to evaluate nutrition surveillance programmes, the knowledge, attitude and practices of health personnel evaluated in different nutrition and surveillance programmes, organisational aspects of nutrition surveillance programmes and factors that have affected their implementation. Lastly, the literature highlights indicators that are commonly used in nutrition surveillance to assess population nutritional status.



#### **Definition of Nutrition Surveillance**

The United States Centre for Disease Control (US CDC) and prevention defines surveillance as ‘the ongoing, systematic collection, analysis and interpretation of health data essential to the planning, implementation and evaluation of public health practice, closely integrated with the timely dissemination of descriptive information to those who need to know (CDC, 2001; Davids, 2001).’ Successful surveillance systems include functional capacities for data collection, analysis and dissemination. These are linked to health programmes and designed intervention. However, Spasoff (1999) highlights the difference between health data, health information, and health intelligence, where, ‘health data refers to unprocessed

numbers of disease or risk factors. When these data are analysed, they become health information. And when health information is interpreted and its implications identified, it constitutes health intelligence. Therefore, the link to surveillance is policy formulation for the application of information to prevention and disease control.'


### **Objectives of Nutrition Surveillance Systems**

Nutrition surveillance systems are designed according to the type of nutrition problems that exist in a given population. However, the main aim of surveillance is to monitor the occurrence of nutritional problems over time. In addition, nutrition surveillance provides information on when and where health problems are occurring and who is affected. In so doing, surveillance describes the demographic characteristics of individuals who are affected by nutritional problems, which in turn allows for the identification of vulnerable groups. The information is essential in the design and focus of programmes (Last, 1995). In addition, Shoham *et al* (2001) differentiates the principle objectives of nutrition surveillance systems as: programme design, crisis management, programme management and evaluation, macro and international level policy-making and advocacy for programmes.

#### **2.1 FUNCTIONS OF NUTRITION SURVEILLANCE**

According to literature, the purpose of a nutrition surveillance system has three major functions. These functions are described below:

a. **Nutrition Surveillance for Health and Development Planning**

Shen, *et al* (1991) have highlighted the central focus of surveillance for health and development planning and use of information for decision making, policy directives and targeting of programmes (Shen and Habict (1991). In addition Pelletier (1995) identified the use of information in Planning nutrition programmes. In countries like Kenya, Sri Lanka (ACC-SCN, 1981) and Costa Rica (Valverde *et al*, 1981) and Zambia (GRZ, 1979) nutrition units were established with the objective of orienting government activities towards improving nutrition status of the population. Acute nutritional problems normally take the monitoring and evaluation system. These are normally implemented at programme or at regional level.  The World Health Organization (WHO) noted that, designing nutrition surveillance for programme management and evaluation differs from the surveillance for planning and development. The difference lies in the organization structure, data needs, sampling procedure, cost required as well as human technical capacity requirements (Mason *et al*, 1984).

***Development plans and policy directive***

Development plans are used at national, ministerial as well as at programme level. In Zambia, the first and second National Development Plans (GRZ, 1979) used nutrition information that was collected using the first National Nutrition Survey (FAO, 1972). Thereafter, a policy directive was passed to introduce monitoring of the growth of children attending the MCH clinic. Hence the Growth

Monitoring and Promotion programme in Zambia (ZIHP, 2003). The current national health strategic plan (NHSP) under the ministry of health uses the information from the growth monitoring points (MOH/CBOH, 1998). These plans have included a summary of nutritional problems in relation to economic factors based on the nutritional problems in the country. In Kenya, and Philippines, Costa Rica and Sri Lanka, information has been used for the national development plans, policy directives for different programmes (Mason *et al*, 1984).

### ***Targeting and control of national programmes***

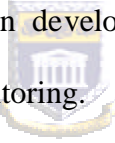
According to the World Food Programme, departments of health have used nutrition information for targeting national programmes. In the Philippines, targeting is based on estimated prevalence of malnutrition both at central and government levels. This is the same in Zambia, where data is used for targeting supplementary feed requirements for respective districts (WFP, 2000).

### ***Identification of specific problems***

According to Mason, *et al*(1984), information from nutritional surveillance highlights poorly understood health problems. This is the case of malnutrition or other health indicators such as mortality. In some cases, nutritional status indicators of a region might be higher than the established prevalence of the country. For example, in Sri Lanka, analysis of nutritional data showed that the

prevalence of stunting (<90% height for age) among children of tea estate workers were double that for the rest of the country (mean: 62% in estates compared to 31% in villages). In the Northern province of Zambia findings for weight for age show that 33.8% of the children were underweight (<-2 SD weight for age) and 10.4% severely underweight (<-3 SD weight for age) (CSO *et al*, 2002). Such information from the two examples above can be used to identify specific problem areas and design programmes that can be used to mitigate the nutritional and related problems.

**b. Nutrition Surveillance for Programme Management and Evaluation**

According to Pelletier (1981) in developing countries, nutrition surveillance is referred to as nutrition monitoring.  In addition, monitoring of nutrition programmes takes the form of weights or heights of children attending health centers. According to Soekirman and Karyadi (1995), supporting actions toward better nutrition implies using information, which is a much more complex and uncertain matter than producing information, as the production of information deals with data, whereas, the use of information deals with persons, organizations and society. The use of information has been identified in programme management and evaluation. In which case, conditions for use of information identified were: political and social context, active management, the scope of surveillance, production of information near decision makers, communicating results and decisions supported by nutrition surveillance (Rodriguez, 1995).



c. **Nutrition Surveillance for Timely Warning and Intervention Programmes**

Emergencies situations are one of the areas that nutrition surveillance has been used. This mainly focuses on timely warning of food security situation and intervention that can be done. In a recent study conducted by Reed and Habicht (2002) “translating nutrition research into action in humanitarian emergencies,” the study revealed that during acute stages of emergencies, when therapeutic feeding centers are established to rehabilitate severely malnourished children, limited resources often require tightening of screening criteria to reduce admissions. Cut offs are reduced in order to lower the number of admissions (admitting those <60% of the reference standard weight for height instead of <70%).

2.2 **TYPES OF NUTRITION SURVEILLANCE**

Beghin, *et al*(2002) have identified two major types of nutrition surveillance that have been used globally. These are passive surveillance and active surveillance. The differences between the two systems lie in the method of data collection and transmission of data to the source of intended use. Passive surveillance is the surveillance that collects routine data from institutions. The data derived is not usually representative of the catchment’s population as children that attend the clinic might be the ones that need the health services most. In Zambia, active surveillance is used to supplement passive surveillance. These are normally cross sectional surveys that have been used to monitor national level programmes (CSO, 1991). Active surveillance collects data from the community level and is representative of the community. The cost of the two types of surveillance is

different. In Zambia and Malawi, the cost of passive surveillance was estimated at \$1.90 per day per health center while the cost of active surveillance has been estimated at \$50,000 per survey of 250 to 1,000 households (UNICEF, 1995).

## **2.3 EVALUATION METHODS USED IN NUTRITION SURVEILLANCE PROGRAMMES**

Evaluation methods used in evaluating surveillance programmes have used both qualitative and quantitative methods. Qualitative methodologies have been useful in context and input monitoring; and process evaluation of programmes while quantitative methodologies have been used in outcome and impact evaluation. According to Oshaug (1992) the use of both types of methodologies strengthens validity of findings carried out in the evaluation. However, Bloem *et al* (2002) identified an effective evaluation model for nutrition surveillance programmes that is linked to the malnutrition causal model and the trip A cycle. The malnutrition causal model delineates the layers of causality of the information system as well as the public health programmes focusing on *the immediate, underlying and basic cause* of the identified manifestations; while the triple A cycle uses the cyclic model of activities that need to be implemented from the identified causes in the causal model with specific focus on the required *analysis, assessment and action*. The combination of the trip A cycle and causal model consolidates the analysis, assessment and action required at each level of programme implementation.

## 2.4 KNOWLEDGE, ATTITUDES AND PRACTICES OF HEALTH WORKERS IN NUTRITION SURVEILLANCE PROGRAMMES

Growth monitoring and promotion programme is one of the first level primary health care programmes that is used to collect nutrition indicators for nutrition surveillance. In a qualitative evaluation of growth monitoring and nutrition surveillance Mahshid, (1998) revealed that health workers did not know the difference between growth monitoring and nutrition surveillance. The main strategy of growth monitoring is the preservation of normal growth for children and is implemented at individual level while that of surveillance is the detection of under nutrition of groups or for population level.

In a recent evaluation of the knowledge and attitude of 8 trained and untrained clinic health personnel toward growth monitoring and promotion in Lusaka urban health centres revealed that, 7(87.5%) of trained clinic personnel and 6(75%) untrained clinic personnel gave a correct definition of the programme. However, a comparison of their attitude toward the programme revealed that 1(12.5%) trained health personnel had a positive attitude of the programmes as it facilitated improvement in immunization coverage, 2(25%) mentioned that the programme was an opportunity in providing infant feeding messages. Both trained and untrained health personnel 5(62.5%) and 8(100%) respectively, revealed that the programme was an opportunity for assessing children's health status (Kawana, 2004).

One of the major reasons for obtaining low vitamin A supplementation coverage in micronutrients surveillance programme has been attributed to the low knowledge and practice of health workers towards the supplementation programme. An evaluation of 5 out of 78 provinces of the Philippines micronutrients surveillance programme on the knowledge, attitude and practices of health workers towards the surveillance programme by Bloem and de Pee (2001) revealed that more than 50% (300) of the hospital workers and other health workers interviewed did not have policies and guidelines for the micronutrients programme. Similarly, more than 50% (300) of the health workers interviewed had not seen the guidelines mentioned during the evaluation. About a third of the public health staff had not received orientation on micronutrients programme and the surveillance system in place.



However, Marjolein *et al* (2001) in the study to identify factors for job motivation of rural health workers in Northern Vietnam found that health workers who had positive attitudes toward work performed better in their work. This included feedback on performance management from their supervisors.

## **2.5 FACTORS THAT AFFECT THE IMPLEMENTATION OF NUTRITION SURVEILLANCE PROGRAMMES**

A review of literature identified five critical success factors that affect the implementation of nutrition surveillance programmes. These are: perception and understanding of programmes; effective demand for the programme; capacities to

co-ordinate and implement programmes; resources for information system and; resources for action. Urban (1995) mentions that successful nutrition surveillance programmes that have used the triple A cycle approach in their design of the nutrition surveillance systems have overcome the four critical factors above.

## **2.6 ORGANISATION OF THE SURVEILLANCE SYSTEM**

The surveillance system needs to be placed in an organizational perspective. This perspective is also known as an information cycle (Gouws, 2003). These are data collection, data flow, data processing, analysis and interpretation which are linked to decision-making. Furthermore, Braa (1997) reveals the sociological functions of the information cycle where data is organised in structural functionalist and symbolic interactionist perspectives.



In Zambia, the current system involves health workers from the point of collection to analysis. Clinic staff in the respective clinics does data collection. At district level, data is handled by information officers that have been trained in handling data by the Central Board of Health (Chishimba, *et al* 1993). This also applies to the central level staff at the Central Board of Health.

## **2.7 INTEGRATION OF NUTRITION SURVEILLANCE AND HEALTH MANAGEMENT INFORMATION SYSTEM (HMIS) IN ZAMBIA**

The integration of the nutrition surveillance programme with the HMIS in Zambia in 1996 was designed to improve data utilization at different levels (MOH and

CBOH, 1996). In the HMIS, data is collected daily from children attending the children's clinic where other health services are provided. Data is sent to the district and at the national level. At district level, data is processed, analysed and used for planning of interventions. At national level, the CBOH, data is processed and utilised by the nutrition commission, and other departments of health involved in child health programmes (MOH, 1996).

## 2.8 INDICATORS FOR NUTRITION SURVEILLANCE

Surveillance indicators that have been used are clinical, anthropometric and biochemical indicators:



Clinical observations of protein energy-malnutrition are significant for serious cases where there is severe wasting and /or edema. These are normally used in active surveillance (Beghin *et al* 2002).

Anthropometric indicators used are weight and height, with a combination of age. The age range of children is often from 6 months to 5 years. Anthropometric measurements have been shown to predict mortality risk in a population. In Malawi, mortality in under five children revealed the relative importance of growth retardation as a cause of mortality in children (Pelletier D, 1981). Other studies in India (Keilman *et al*, 1978) and Bangladesh (Chien, 1980) also confirmed this finding.

Cut off points for anthropometric indicators could be based on the following classification:

- The Gomez classification; 60%, 75% and 90% percentiles (Gomez *et al*, 1956),
- The Waterlow classification: weight for height and height for age are generally presented separately, although a division into four categories (normal, stunted or wasted, wasted not stunted, wasted and stunted) have also been used (Waterlow JC, 1973). The Waterlow classification has an advantage of distinguishing between chronic and acute malnutrition. In Kenya, the use of height for age has been used in planning for development (UNICEF, 1995). While in South Africa weight for age indicators have been used in the feeding supplementation projects (Sanders and Chopra, 1997; Marld and Bresin, 1998; Shuan, 1988) as well as in Zambia (WFP, 2000).
- Biochemical indicators that have been used in surveillance are serum retinol for measuring vitamin A status in preschool children (NFNC 1997; NFNC, *et al* 2003). These have been used in surveillance for programme monitoring. They have been collected using the active surveillance system. Haemoglobin levels (Hb) indicators have been used in Bangladeshi (HKI, 2003) and in Zambia (NFNC, 1989; NFNC, *et al* 2003) in the Nutrition Surveillance Programme. The two biochemical indicators are a measure of the social economic status of the population.

## **Inaccuracies In Calculation of Surveillance Data**

Despite all the above indicators being used in different programme settings, inaccuracies of data have been reported in a joint workshop on regional databases conducted by UNICEF (1984). The workshop reported that out of the thirteen countries participating in the workshop, 64% of the data sets had inaccurate data ranging from 45 to 83%. While (CDC, 2001) reported that accurate, reliable measurements are fundamental to growth tracking and sound clinical judgment, a number of studies have illustrated a inaccurate measurements in a variety of health care settings. Philip-Howard, *et al* (1980) in a study to validate malaria surveillance case reports, only 65% of health workers were able to calculate indicators required for malaria surveillance. Similarly, Emori *et al* (1998) found that only 62% of health workers were able to give accurate calculation of reporting nosocomial infections in intensive care unit to the National Nosocomial Infections Surveillance System pilot study.

## **2.9 CONCLUSION**

The literature reviewed highlights the different designs of nutrition surveillance programmes and what they intend to achieve. Evaluation methods and factors that affect implementation of nutrition surveillance programmes have been reviewed.



## **CHAPTER 3**

### **RESEARCH METHOD**

#### **3.0 STUDY DESIGN**

This was a cross sectional descriptive study using qualitative and quantitative research methods of data collection. The study design was chosen as it was aiming at getting immediate knowledge and information of health personnel's attitudes and current practices about nutrition surveillance in Zambia.

Furthermore, since the study was the first of its kind in Zambia, it was appropriate to begin with a descriptive study in order allow continued exploration with future studies.

#### **3.1 STUDY SITE**

Zambia is situated in the southern part of Sub- Saharan Africa. It is bordered by the Democratic Republic of Congo and Tanzania in the north, Malawi and Mozambique in the east, Zimbabwe, Botswana and Namibia in the south and; Namibia and Angola to the west. For administrative purpose, the country is divided into nine provinces and 72 districts.

### 3.2 TARGET POPULATION

The target population of the quantitative component of the study was obtained from six categories of district level health personnel. These comprised the following: nutritionists and or public health nurse (since there are no nutritionists in all districts, the public health nurse responsible for nutrition programmes was recruited in place of a nutritionist not available in respective districts), Maternal and Child Health (MCH) coordinators, planning manager, information officers and the clinical care specialist replaced the District Director of Health who were very difficult to access at the time of the study.

### 3.3 CRITERIA FOR INCLUSION OF STUDY SUBJECTS IN THE STUDY

All available health personnel that are the primary contact of all nutrition programmes at district level as well as those working in nutrition information data in programmes were included in the study.

### 3.4 STUDY VARIABLES

The following study variables were used in the study:

***Demographic variables:*** These included data on sex, type of profession, length of service in profession.

***Knowledge variables*** included knowledge of nutrition surveillance, knowledge of health management information system, ability to give a correct calculation of nutrition indicators, ability to give a correct interpretation of nutrition indicators; and knowledge of target population and their proportion in the general population.

|

*Training variables* included attendance of a training course on nutrition surveillance or health management information system and focus of training.

*Attitude variables* included usefulness of nutrition data collected.

*Practice variables* included use of nutrition data and area, role in nutrition data collection and handling.

*Other variables* included problems encountered in obtaining, using and sharing of nutrition data.

### 3.5 SAMPLE SIZE CALCULATION

The sample size of health personnel was calculated using Epi-info 6.4b statistical package. The calculation involved using Epi table calculator for sample size single proportion. Given a target population of 360 health personnel involved in nutrition and health information systems in the country, an expected prevalence of 40% of health personnel with positive attitudes towards surveillance, and a 5% acceptable degree of error, the total sample size obtained was 108 health personnel at 80% confidence level. This was rounded off to 110 health personnel. There are 5 target health personnel in each district involved in nutrition programmes and information systems, dividing the given sample size by 5 gave a total of 22 districts that were required to be sampled across the country.

### 3.6 SAMPLING PROCEDURE USED TO SELECT DISTRICTS

There are 9 provinces in Zambia. The provinces and their respective districts were listed in alphabetical order. Each number of districts required in each province was calculated proportionate to population of the number of districts in the province. A random number was obtained from the random tables in excel programme. The random number was thereafter used to determine the starting point for selecting districts in each province. The selection of the districts was done using excel programme with the aid of a statistician. The distribution of the districts according to provinces is listed in appendix 1.

### 3.7 RESEARCH INSTRUMENTS



The following study instruments were used in the study:

*Record review* was done during the literature search. Records were reviewed on institutions involved in surveillance programme implementation, data flow and management of programmes (appendix 2).

*Semi-structured questionnaire* was used to collect information on knowledge, attitudes and practices of district health personnel about nutrition surveillance (appendix 3).

|

*Focus Group Discussion* was conducted to explore views on attitudes and practices of health personnel about nutrition surveillance (appendix 4).

### **3.8 DATA COLLECTION**

#### **Record Review**

Records were reviewed on institutions involved in surveillance programme implementation, data flow and management of programmes. The record review method was used to collect information on nutrition surveillance in order to give an overview of how nutrition surveillance programme is implemented in Zambia. A list of records reviewed from each institution is provided in appendix 2. These records included programme and annual reports. The records that were reviewed were aimed at documenting the different levels of programme implementation as well as the roles of institutions implementing nutrition surveillance programme in Zambia.

#### **Questionnaire**

Permission to collect data was sought for at the Central Board of Health (CBOH). After permission was granted, a letter asking the districts to allow the research to be conducted was written to the respective districts by the Director General of the CBOH. First contact was made to the districts by telephone followed by the faxed letter.

Research assistants were therefore, requested to go to the districts with the letter of introduction. The district directors of health allowed the research assistants to collect the information required. Upon consenting to the study (see consent form in appendix 5), district health personnel were given the questionnaire to fill in. Due to non availability of some health personnel, in most of the districts, questionnaires were sent to the districts, in-order for the information officers to distribute the questionnaires to the specific health personnel. The information officers sent back the questionnaire to Lusaka after they were completed.

### **Focus Group Discussion**

A focus group discussion was used to collect information that could not be collected using the questionnaire such as “problems encountered in collecting nutrition data, perception and attitude about nutrition information collected at district level, use of data collected and improvements that can be done to improve collection and utilization of data.”

One focus group discussions was held with purposively selected district personnel. This was after quantitative data was collected; the researcher went through the questionnaire to select personnel who had positive attitudes toward nutrition surveillance in-order to explore their attitudes about the program. The participants that responded positively to the questions “is nutrition data useful?, and how useful is nutrition data to nutrition programmes?” were recruited in the

quantitative part of the study. A total of 12 health personnel were invited to participate in the discussions, and only 8 participated in the discussion.

A Focus group discussion guideline was developed and used during discussions to ensure that all points of interest are covered. The questions:

- What does surveillance mean to you in terms of collecting, interpreting and utilizing information?
- Are you happy with your involvement in the programme in terms of the knowledge and skills you have?
- What are some of the challenges you are faced with in your daily activities?
- What are some of the improvements you would like to see in the programme in terms of data collection, analysis, and utilization?

These questions were used in the discussion to ensure that all points of interest were covered.

A research assistant was used to record the focus group discussion while the principal researcher facilitated the discussion of the group. A recorder was also used to capture the proceedings of the focus group. The focus group discussion was conducted in English the language known by all health personnel. The discussions took place until saturation was reached (no new information was discussed).

### **3.9 TRAINING OF FIELD RESEARCH ASSISTANTS AND PRE-TESTING OF QUESTIONNAIRE**

Three research assistants were trained to collect data at district level. Two and a half days were used for training as well as pre testing of the questionnaire. The questionnaire was pre tested to determine their validity. The pre-testing was done in Chongwe, a district outside the districts that were sampled for the study. Data was entered on epi-info computer package to determine how the study analysis would be done. In addition, pre-testing of the questionnaire focused on health personnel understanding of questionnaire, clarity and flow of questions. This helped to reduce limitations on understanding as well as non-response to questions. Minor changes to the questionnaire were made appropriately.



### **3.10 DATA ENTRY AND ANALYSIS**

#### **Record Review**

Data from the record review was transcribed and written according to programme organisation and institutional collaboration, roles of the institutions in surveillance and programme implementation was also documented. A flow chart has been used to give a clear understanding of the implementation concept. Different levels of implementation have also been identified.



## **Questionnaire**

A data entry clerk was used to enter quantitative data from the questionnaire. This was done using the computer package epi info 6.4b. Semi-structured questions were coded before entering on the computer for analysis. Analysis was done by the principal investigator using the same computer package. The package was identified, as it is well known by the student. The package is able to handle small sample sizes of less than 30. It is also able to handle variables less than 90. Frequency tabulations have been produced for categorical data. Proportions of health personnel categories have been produced for comparison among the categories of health personnel.

## **Focus Group Discussion**



Data from the focus group was transcribed verbatim and the information entered on a matrix. Analysis was done according to themes and content.

### **3.11 VALIDITY AND RELIABILITY OF COLLECTED DATA**

In-order to ensure validity and reliability of the data collected, the following were done:

- Research assistants were trained to ensure standardized data collection procedure. Each health personnel was not permitted to share the information with other health personnel nor consultations permitted.

- Reflexive questions were asked to clarify concepts, understanding and knowledge of the focus group.
- All instruments were pre tested to determine their validity. Pre-testing was done in Chongwe, a district that was not sampled for data collection. Pre-testing of instruments focused on understanding of questionnaire, clarity and flow of questions and corrections were made appropriately.

### **3.12 ETHICS**

Participants recruited in the study were informed the purpose of the study. Consent for participation was sought prior to the administration of study instruments. A signed consent form was obtained from the health personnel. The consent form highlighted that participants recruited in the study would not have their professional reputation affected. 102 health personnel from the 21 districts consented to the study and were recruited anonymously. Only their title/profession was reflected on the questionnaire for demographic analysis purpose. Only 1 personnel did not consent to participate in the study and 2 personnel were out of station at the time of the study. Therefore, the 3 health personnel did not participate.

# CHAPTER 4

## RESULTS

### 4.0 INTRODUCTION

Presentation of the study results is to be done in three parts. Part one focuses on data collected using record review. Part two, presents data collected using the questionnaire, and part three, presents data collected using the focus group discussion.

### 4.1 RECORD REVIEW



**Objective 1:** *To describe the process of implementing nutrition surveillance programme in Zambia*

The record review method was used to collect information in order to give a general overview on how nutrition surveillance programme is implemented. Records reviewed were aimed at documenting the different levels of implementation as well as the roles of implementing institutions under the ministry of health.

## FINDINGS

### Objectives of Surveillance

The long-term objective of Zambia's nutrition surveillance is to provide information on nutrition programmes for advocacy, programme monitoring and management, and information to policy makers for decision making.

### Programme Structure and Activities

The surveillance programme in Zambia is designed around the different institutions that collect nutrition indicators. Four levels of implementation have been identified. These are illustrated in figure 1



**Level 1:** This level is the ministerial level. The ministries included are: the Ministry of Health (MOH), Ministry of Agriculture and Cooperatives (MACO), The Bureau of Statistics which is under Ministry of Finance and Economic Planning (MFEP), and the Ministry of Commerce Trade and Industry (MCTI).

**Level 2 and 3:** Each of the ministries in level 1 has different programmes that are implemented in levels 2. Level 2 is the programme at district level while level 3 is at central level. The following are the different programmes that are implemented at levels 2 and 3:

|

*Ministry of Agriculture and Cooperative* collects information on security and nutrition indicators

*Ministry of Health* collects information on Infant and Young Child Feeding (IYCF), therapeutic and supplementary feeding, growth monitoring, micronutrients supplementation of iron and vitamin A, and indicators on enforcement of fortified foods.

*The Bureau of Statistics* collects information on food security, infant feeding, micronutrients supplementation fortified commodities, and general nutrition indicators

*The Ministry of Commerce Trade and Industry* collects information on micronutrients fortification of commodities fortified with iodine, salt; vitamin A sugar and multi-mix, maize meal.

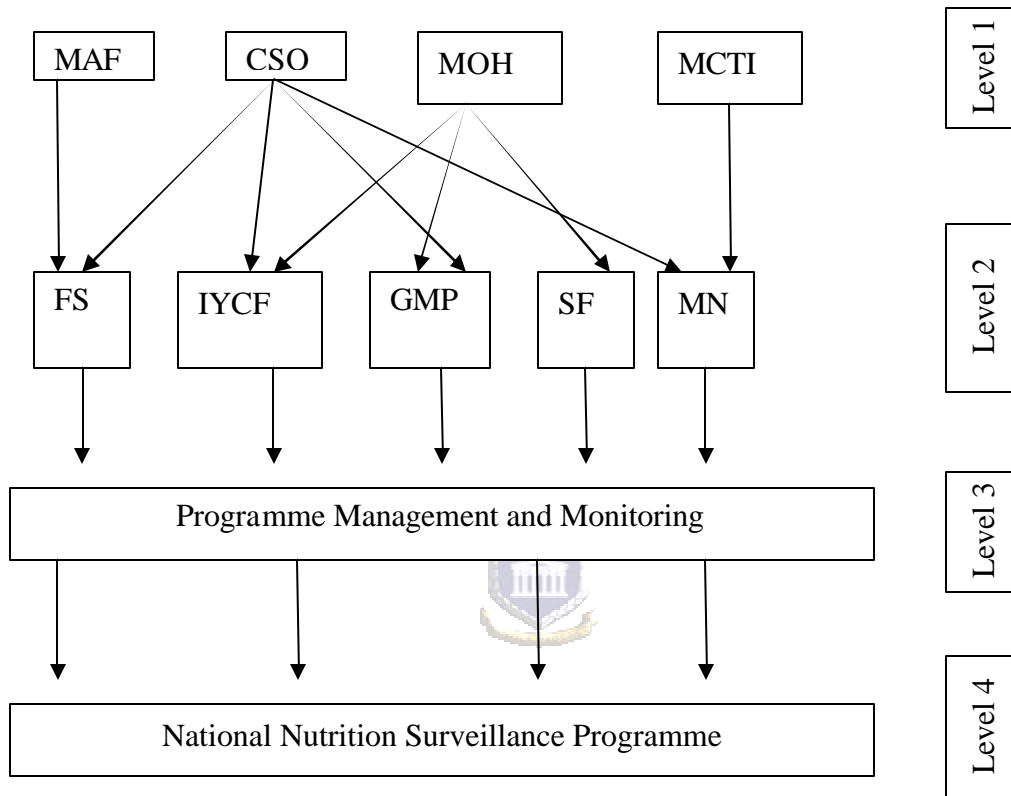


**Level 4:** At this level, information from levels 2 and 3 is sent to the Central Board of Health (CBOH) and the National Food and Nutrition Commission (NFNC). These two organizations are under the Ministry of Health. Information is thereafter analyzed and used in decision making. Level 4 develops policy directives for the country.

In addition, the study also found that at each level of surveillance there is use of information in decision making according to monitoring results. For example results in programme monitoring are used to improve performance of the programme by allocation of resources or introduction of an intervention. These levels are depicted in figure 1 below.

## Illustration of the Nutrition Surveillance Programme Concept in Zambia

**Figure 1: Illustration of Nutrition Surveillance Programme Concept in Zambia**



**Key**

- FS: Food Security
- IYCF: Infant and Young Child Feeding
- GMP: Growth Monitoring and Promotion
- SF: Supplementary Feeding
- MN: Micronutrient

The study found that nutrition surveillance programme collects various indicators from different programmes. Table 1 highlights the indicators collected by different programmes.

**Table 1: Indicators Collected by Different Nutrition Programmes in Zambia**

Programme	Indicators
Food Security	<ul style="list-style-type: none"> <li>• Access to food, access to health services</li> </ul>
Infant and young child feeding	<ul style="list-style-type: none"> <li>• Proportion of infants 0-6 months exclusively breastfed</li> </ul>
Growth monitoring	<ul style="list-style-type: none"> <li>• Proportion of children 6months to 5 years underweight</li> </ul>
Supplementary feeding	<ul style="list-style-type: none"> <li>• Proportion of children 6 months to 5 years underweight given supplemental feeds</li> </ul>
Micronutrients	<ul style="list-style-type: none"> <li>• Proportion of children 1 year to 5 years dewormed,</li> <li>• proportion of children 6 months to 5 years given vitamin A supplements</li> <li>• Proportion of salt, sugar and maize meals samples with adequately fortified levels of fortification</li> </ul>

|

## **Roles of Different Levels of Programme Implementation under the Ministry of Health**

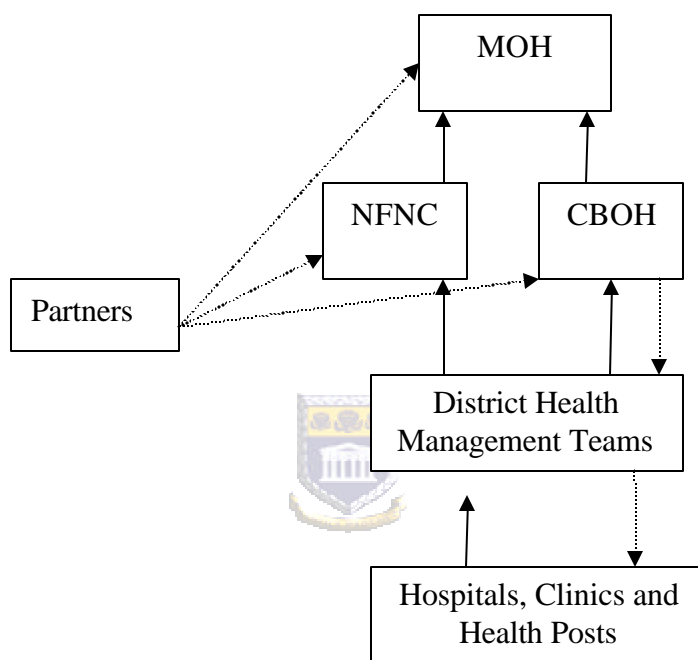
This section highlights the roles of different levels that collect nutrition information under the ministry of health since focus of this study is the health personnel that are under the ministry of health. Figure 2 depicts the flow of information within the ministry of health.





## Illustration of the Flow of Information within the Ministry of Health

**Figure 2:** Flow of Information within the Ministry of Health



### **Key**

—————> Flow of data and information

.....> Flow of implementation funds

CBOH Central Board of Health

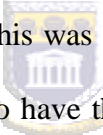
NFNC National Food and Nutrition Commission

Partners: UNICEF, WHO, USAID and JICA

Figure 2 reveals that data collected from the different health centres is sent to the District Health Management Team (DHMT) at the district office. At this level, data is entered into a computer for analysis. The raw data is sent to the Central Board of Health as well as the National Food and Nutrition Commission. The raw data are analysed and reports written for decision making.

### **Decisions that Have Been Made Using Nutrition Data**

The following are some of the decisions that have been made at policy level in the last decade (1995-2005) using data from the nutrition surveillance programmes:

- Change of implementation strategy of the vitamin A supplementation programme from routine system in the maternal and child health units of the health services to a social mobilization strategy.  This was done in 1996 to increase coverage of the vitamin A programme in order to have the desired effect of reduction in vitamin deficiencies and an expected 23% mortality reduction (NFNC, 1996).
- Introduction of Sugar fortification programme in 1998 (NFNC, 1996)
- Restructuring of the National Food and Nutrition Commission in order to meet programme demands and support from the ministry of finance and economic and development (GRZ, 2004)
- Ratification of the Zambian Food and Nutrition Policy (GRZ, 2004)
- Allocation of nutrition chapter in the fifth National Development Plan under the Ministry of Finance and Economic Development in order to increase funding and management of nutrition programmes in Zambia (GRZ, 2005).

## 4.2 QUESTIONNAIRE

The questionnaire was used to collect quantifiable responses of data in order to give a general overview of the knowledge, attitude and practices of health personnel about nutrition surveillance in Zambia. Questions asked were aimed at determining some association in variables between knowledge of health personnel by the different categories; roles of health personnel by the different categories of health personnel; and roles of health personnel by focus of training workshops attended.

The findings of these analyses are important to the study as it would determine the specific recommendations to be made to the program. For example, in order to improve knowledge, management and use of information among the health personnel, the training curriculum could be developed with emphasis on:

- “The focus of training workshop<sup>1</sup>” (e.g data entry, analysis, interpretation, accuracy checks etc);
- “Level of training workshop” (basic, intermediate and advanced levels) of curriculum to be implemented.

This would improve knowledge on management of data, and use of information obtained from different health centres for programme monitoring and management.

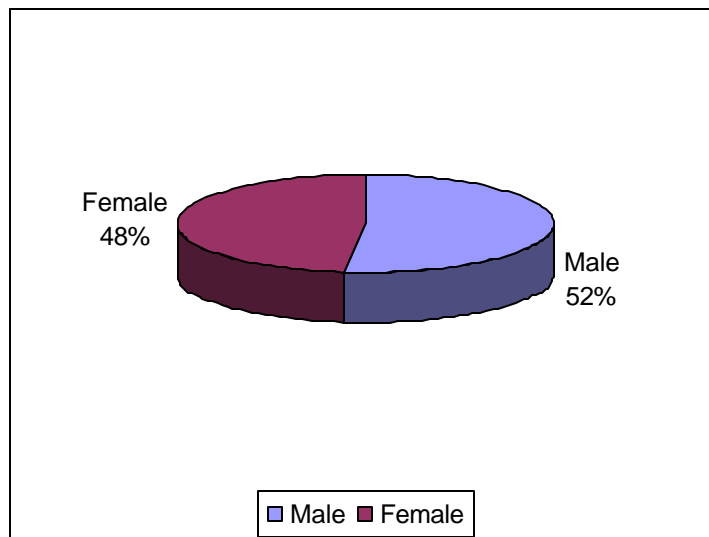
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<sup>1</sup> Training workshop: This is a course that is designed to impart knowledge and improve skill of health personnel about a specific programme. The duration of the workshops are normally 1 to 2 weeks.

## RESPONSE RATE

A total number of 21 (95%) out of 22 selected districts participated in the study with a total of 102 participants, 53 (52%) males and 49 (48%) females. For the district that did not participate in the study, questionnaires did not arrive on time for data entry and analysis. One person did not consent to the study while 2 were not present in the district at the time of data collection. Figure 3 highlights the information in a pie chart.

**Figure 3: Response Rate of Health Personnel**



## DEMOGRAPHIC INFORMATION

The demographic information in this section has been collected to determine the profile of the categories of health personnel that have been recruited in the study. In addition, the total number and categories of health personnel was the basis for determining the relationship between some variables that have been calculated.

## CATEGORIES OF HEALTH PERSONNEL

Table 2 highlights the total number of staff per category of health personnel as well as the proportion of districts that had at least one staff member in each staff category.

**Table 2: Categories of the Study Participants**

<b>Category</b>	<b>Total number of Staff who Participated per Category</b>	<b>Proportion (%) of Districts with at Least one Staff Member in Each Category (N=21)</b>
Nutritionist	11	52
Public Health Nurse	8	38
Nurse MCH Coordinator	20	95
Information Officer	20	95
Planning Manager	19	90
Clinical Care Specialist	10	48
Others	14	67

Since nutritionists are not available in all the districts, public health nurses were asked to provide the information for the research since the public health nurses do work in place of nutritionists where there was no nutritionist. Therefore, a

combined total of the nutritionist and public health nurse frequency was 19 (19%) with a combined district proportion of 90% of districts.

The other categories “Others” included 2 directors of public health, 4 environmental health offices, 3 Zambia Enrolled Nurse (ZEN) and 4 Zambia Enrolled Midwives (ZEN) in the MCH department, and in one case a family planning nurse.

### **LENGTH OF SERVICE IN PRESENT POSITION**

Data on length of service in the present position was collected in order to determine if knowledge, use of information and attitude to nutrition surveillance information was related to length of service in the present position.

**Table 3: Length of Service in Present Position**

<b>Duration Service in Present Position</b>	<b>Frequency of Service</b>	
	<b>(n)</b>	<b>(%)</b>
Less than 3 year	32	31
4 to 6 years	31	30
7 to 10 years	19	19
Above 10 years	20	20
<b>Total</b>	<b>102</b>	<b>100</b>

Table 3 shows that 31% of health personnel have served less than 3 years in their present position and the rest have served more than 4 years.

#### **4.2.1 INFORMATION ON KNOWLEDGE OF NUTRITION SURVEILLANCE**

**Objective 2:** *To assess the knowledge of district health personnel about nutrition surveillance.*

This section highlights the knowledge of health personnel about nutrition surveillance. Different questions have been asked to health personnel in order to determine knowledge of the surveillance system. The questions included were about: Information systems known, activities of an information system, information systems that health personnel are familiar with, attendance of an information system training workshop, ability to calculate nutrition indicators, interpretation of indicators and use of nutrition indicators in decision making at district level.

##### **Categories of Health Personnel that Know the Activities of Nutrition**

##### **Surveillance and Health Management Information System**

In order for any information systems to work, there are a series of activities that take place to accomplish use of information. Participants were asked about

activities which form part of a Nutrition Surveillance (NS) and Health Management Information Systems (HMIS). For each of the listed activities they had to indicate whether the activities were appropriate for both NS and HMIS, see table 4 and 5. Note that all activities listed are appropriate for nutrition surveillance system. However, the information obtained was not of much help to the study as nearly all responses were marked appropriate.

**Table 4: Categories of Health Personnel that Know the Activities of Nutrition Surveillance System**

Category	Frequency (N)	Activities of a Nutrition Surveillance System					
		Data Collection (%)	Accuracy Checks (%)	Data Analysis (%)	Reporting (%)	Planning (%)	Advocacy (%)
Nutritionist	11	100	100	100	100	100	100
Public Health Nurse	8	100	88	100	100	100	75
Nurse MCH Coordinator	20	100	95	100	100	95	85
Information Officer	20	100	95	95	100	95	75
Planning Manager	19	100	100	100	100	100	95
Clinical Care Specialist	10	100	100	100	100	100	100
Others	14	86	86	78	72	78	72
<b>Total</b>	<b>102</b>	<b>98</b>	<b>95</b>	<b>96</b>	<b>96</b>	<b>95</b>	<b>85</b>



**Table 5: Categories of Health Personnel that Know the Activities of Health Management Information System**

Category	Frequency (N)	Activities of a Health Management Information System					
		Data Collection (%)	Accuracy Checks (%)	Data Analysis (%)	Reporting (%)	Planning (%)	Advocacy (%)
Nutritionist	11	100	100	100	100	100	82
Public Health Nurse	8	100	100	100	100	100	88
Nurse MCH Coordinator	20	100	100	100	100	100	90
Information Officer	20	100	100	100	100	100	95
Planning Manager	19	100	100	100	100	100	95
Clinical Care Specialist	10	100	100	100	100	100	90
Others	14	86	86	86	86	100	57
<b>Total</b>	<b>102</b>	<b>98</b>	<b>98</b>	<b>98</b>	<b>98</b>	<b>100</b>	<b>86</b>

Table 4 and 5 indicate that almost all health personnel know what nutrition surveillance and Health Management Information Systems (HMIS) includes.

### **Types of Information Systems Known to Health Personnel**

Four information systems that collect nutrition information were listed by the health personnel upon being asked to do so. The systems listed were:

- The Health Management Information System (HMIS),
- The Financial Management information System (FAMS). This collects financial indicators on use of funds for health programmes. Indicators on use of funds for nutrition programmes are included in the system.
- The Extended Programme on Immunization (EPI),

- Nutrition Surveillance (NS) and,
- The Anti Retroviral Therapy Information System (ARTIS) introduced last year in the country includes nutrition indicators.

**Table 6: Types of Information Systems Known to Health Personnel**

<b>Information System</b>	<b>Know (N=102)</b>	<b>Missing (N=102)</b>
Health Management Information System (HMIS)	80%	20%
Financial Management Information System (FAMS)	6%	94%
Extended Programme on Immunization (EPI)	18%	82%
Nutrition Surveillance (NS)	40%	60%
Anti Retroviral Therapy Information system (ARTIS)	6%	94%

Table 6 reveals that the HMIS is the mostly known system by the health personnel (80%) and the least known are the Anti Retroviral Therapy Information System (ARTIS) and the Financial Management Information System (FAMS) (6%).

#### **Types of Information Systems Known by Category of Health Personnel**

This analysis aimed at determining the information system known to each category of health personnel. The proportion of each category of health personnel that know the information system is also highlighted.

|

**Table 7: Types of Information Systems Known by Categories of Health Personnel**

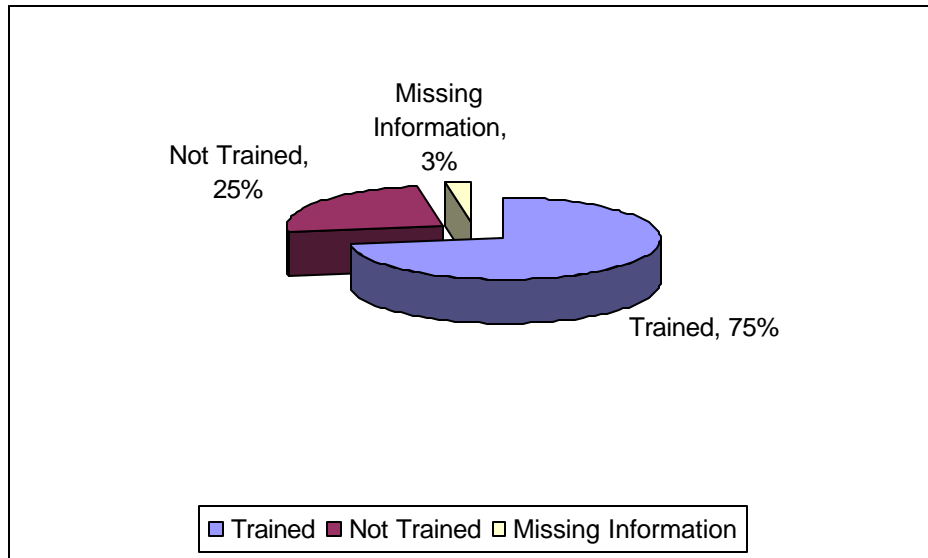
Category of Health Personnel	Proportion of Health Personnel That Know Each Types of Information Systems					
	(N)	HMIS (%)	FAMS (%)	EPI (%)	NS (%)	ARTIS (%)
Nutritionist	11	72	18	9	100	0
Public Health Nurse	8	50	0	12	25	0
Nurse MCH Coordinator	20	65	0	10	10	0
Information Officer	20	100	0	10	65	10
Planning Manager	19	100	0	16	47	11
Clinical Care Specialist	10	70	40	10	30	10
Others	14	78	0	0	7	7
<b>Total</b>	<b>102</b>	<b>80</b>	<b>6</b>	<b>18</b>	<b>40</b>	<b>6</b>

Table 7 indicates that all information officers and planning managers knew the HMIS (100%) and that FAMS is only known by the clinical care specialists and nutritionists 40% and 18% respectively.

### **Information System Training Rate**

Out of the 102 health personnel participating in the study, 73 (72%) have received training in information systems, 26 (25%) did not receive any training to any of the mentioned information systems and 3 (3%) had missing data. Figure 4 highlights the proportion of personnel trained on information systems.

**Figure 4: Proportion of Personnel Trained on Information Systems**



**Analysis of Health Personnel’s Length of Service and Training Rate**

Table 8 provides a further analysis of the health personnel’s length of service and training status. The categories on length of service have been combined into two in order to determine the relation ship between length of service and training status. The category 6 years and below includes the two categories: less than 3 years and the 4 to 6 years. The category 7 and above includes the two categories 7 to 10 years and above 10 years. This is illustrated in table 8.

**Table 8: Length of Service and Training Status of Health Personnel**

<b>Health Personnel Length of service</b>	<b>Attendance of a Training Workshop</b>		<b>Total</b>
	<b>Trained (+)</b>	<b>Not Trained (-)</b>	
<b>6 years and below</b>	45	17	62
<b>7 years and above</b>	28	9	37
<b>Total</b>	73	26	99

Table 8 indicates that the relative risk of health personnel below 6 years of service compared to health personnel 7 years and above of service is 0.96. Since the Relative risk is below 1 this means that health personnel with 7 years and above of service are less likely to attend a training workshop.

RR (exposure: Length of Service=+; outcome: Training Workshop =+) 0.96 with confidence limits 0.76 - 1.22.

**Category of Health Personnel that Have Been Trained in Information Systems**

The information in table 9 below highlights the categories of health personnel that have received training in information system.

**Table 9: Proportion of Health Personnel Categories That Attended an Information System Training**

<b>Category of Health Personnel</b>	<b>Frequency of Health Personnel (N)</b>	<b>Training System Frequency Attendance (n)</b>	<b>Percentage (%)</b>
Nutritionist	11	8	73
Public Health Nurse	8	3	38
Nurse MCH Coordinator	20	12	60
Information Officer	20	20	100
Planning Manager	19	13	68
Clinical Care Specialist	10	3	30
Others	14	14	100
<b>Total</b>	<b>102</b>	<b>73</b>	<b>72</b>

Table 9 indicates that all information officers and “others” staff have attended an information systems training workshop (100%) and the least attended are the clinical care specialists (30%).

**Proportion of Health Personnel that Have Attended Specific Information System Trainings**

This information provides proportions of each category of health personnel that have attended specific information systems training.

**Table 10: Proportion of Health Personnel that Have Attended Specific Information System Training**

<b>Category of Health Personnel</b>	<b>Frequency of Health Personnel (N)</b>	<b>HMIS (%)</b>	<b>FAMS (%)</b>	<b>EPI (%)</b>	<b>NS (%)</b>	<b>ARTIS (%)</b>
Nutritionist	11	55	0	0	73	0
Public Health Nurse	8	25	0	38	25	0
Nurse MCH Coordinator	20	65	0	20	10	0
Information Officer	20	100	0	20	65	10
Planning Manager	19	63	11	16	42	11
Clinical Care Specialist	10	20	0	0	30	20
Others	14	71	0	0	10	0
<b>Total</b>	<b>102</b>	<b>72</b>	<b>2</b>	<b>14</b>	<b>36</b>	<b>6</b>

Table 10 reveals that all information officers have attended the HMIS, but none of the personnel have attended FAMS, except planning managers, and a few have attended training on other components of the programme. NS have been attended by most of the personnel compared to other components of the programme.

## Interpretation of Nutrition Indicators in Child Health

Three indicators were listed for health personnel to provide an interpretation of what each indicator means. The selected indicators are the commonly used indicators in the identified information systems and are used to determine the nutrition status of an individual or population. This information was collected to determine the knowledge of health personnel in interpretation of indicators.

**Table 11: Interpretation of Nutrition Indicators in Child Health**

Indicator	(N=102)		
	Correct	Incorrect	Missing
Please provide an interpretation of <i>Weight for age</i> <sup>2</sup>	49(48%)	47(46%)	6(6%)
What does it mean when the weight of a child is above 50 <sup>th</sup> percentile <sup>3</sup> (upper line) on the children's clinic card	46(45%)	53(52%)	3(3%)
What does it mean when the weight of a child is below the 60 <sup>th</sup> percentile (lower line) on the children's clinic card	57(56%)	41(40%)	4(4%)

<sup>2</sup> **Weight for Age:** A measure used to measure an individual or a population's nutrition status of commonly known as underweight. (weight-for-age Z-score cut off points of <-1, -2 and -3 SD are used to determine severe, moderate and over weight nutrition levels) and is a composite measure for both stunting and wasting reflecting either chronic or acute malnutrition status or both. It is the general indicator often used to measure the population's health status. (Cogil, 2003; CSO, *et al* 2002)

<sup>3</sup> **Percentiles:** Refers to an individual's relative location/position in comparison to the reference population. (WHO, 1995)



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Table 11 shows that just over half (57%) of personnel could correctly interpret the indicators “below the 60<sup>th</sup> percentile” The other indicators could be interpreted by less than half of personnel

### **Knowledge of Population Proportions of Under-five Years, Age Categories in District Catchment’s Areas**

Different nutrition programmes use different age categories to calculate the required indicators for programme use. The different age categories are the denominators on which the indicators are calculated. Therefore, this question aimed at determining the knowledge of health personnel in using the correct proportion of the different categories in the under five - years population. Table 12 and 13 provide a list of under-five population categories that health personnel were able to give a correct population proportion in their district catchment’s area. The proportions are the denominators that are used to calculate the selected indicators.



**Table 12: Health Personnel’s Knowledge of Population Proportions of Under-five Categories in the District Catchment’s Area**

<b>Under-five Years Population Categories</b>	<b>Correct (N=102)</b>	<b>Incorrect (N=102)</b>	<b>Missing (N=102)</b>
0 to 6 months	43(42%)	47(46%)	12(12%)
0 to 1 year	55(54%)	41(40%)	6(6%)
0 to 5 years	58(57%)	39(38%)	5(5%)
6 months to 5 years	48(47%)	42(41%)	12(11%)

Table 12 Shows that the majority of personnel 55% and 58% could remember the population proportion of 0-1 yr and 0- 5 years respectively.

**Table 13: Knowledge of Population Proportions of Under-five Categories in the District Catchment's Area by health personnel category**

Category of Health Personnel	Frequency (N)	Health Personnel's Knowledge of Population Proportions of Under-five Categories in the District Catchment's Area			
		0- 6 mths (n)	0-1 year (n)	0-5 yrs (n)	6 mths -5 yrs (n)
Nutritionist	11	45%	45%	55%	55%
Public Health Nurse	8	25%	50%	50%	37%
Nurse MCH Coordinator	20	40%	45%	45%	40%
Information Officer	20	45%	70%	70%	50%
Planning Manager	19	68%	68%	68%	68%
Clinical Care Specialist	10	20%	30%	40%	30%
Others	14	29%	50%	57%	36%
<b>Total</b>	<b>102</b>	<b>42%</b>	<b>54%</b>	<b>57%</b>	<b>47%</b>

Table 13 indicates that information officers and planning managers are better at knowing the different population categories in the under five population of the districts catchment's area.

## Health Personnel's Ability to Provide a Correct Calculation of Nutrition Indicators in Child Health

In order to further determine the knowledge of health personnel's understanding of nutrition indicators, three commonly used indicators were provided to the health personnel to provide a correct explanation of how they would calculate coverage obtained in their respective district catchment's area. Table 14 and 15 highlights the findings.

**Table 14: Health Personnel's Ability to Provide a Correct Explanation in Calculation of Nutrition Indicators in Child Health**

Indicator	Proportion of Health Personnel Able to Provide a Correct Explanation in Calculating Nutrition to Indicators in Child Health (N=102)		
	Correct	Incorrect	Missing
<b>Underweight Coverage<sup>4</sup></b>	61%	30%	9%
<b>Vitamin A Supplementation Coverage<sup>5</sup></b>	55%	37%	8%
<b>De-worming coverage<sup>6</sup></b>	47%	45%	8%

<sup>4</sup> **Under-weight Coverage:** Total number of children 6 months to 5 years underweight divided by total number of children 6 months to 5 years weighed multiplied by hundred (MOH, 1991).

<sup>5</sup> **Vitamin A Supplementation Coverage:** Total number of children 6months to 5 years given vitamin A supplements divided by the total number of children between 6 months to 5 years in catchment's area multiplied by one hundred (NFNC, 1998)

<sup>6</sup> **De-Worming Coverage:** Total number of children 1 to 5 years given de-worming tablets divided by the total number of children 1 to 5 years in catchments area multiplied by Hundred (NFNC, 1998)

Table 14 indicates that health personnel are better at giving the correct calculation for the under weight coverage (61%).

**Table 15: Proportion of Health Personnel Category Able to Provide a Correct Explanation in Calculation of Nutrition Indicators in Child Health**

Category of Health Personnel	Frequency (N)	Proportion of Health Personnel Able to Provide a Correct Explanation In Calculation of Nutrition Indicators in Child Health		
		Underweight Coverage (%)	Vitamin A Supplementation Coverage (%)	De-worming Coverage (%)
Nutritionist	11	100%	100%	82%
Public Health Nurse	8	25%	50%	63%
Nurse MCH Coordinator	20	50%	40%	45%
Information Officer	20	65%	45%	45%
Planning Manager	19	84%	79%	53%
Clinical Care Specialist	10	50%	70%	50%
Others	14	36%	14%	14%
<b>Total</b>	<b>102</b>	<b>61%</b>	<b>55%</b>	<b>47%</b>

Table 15 shows that only nutritionists were able to give a correct explanation of calculating nutrition indicators with the exception of de-worming coverage which could be explained by 82% of the nutritionists.

## Health Personnel's Knowledge of Childhood Illnesses Contributing to High levels of Malnutrition in Zambia

Knowledge of childhood illnesses contributing to malnutrition is essential. The knowledge is a proxy measure to determine how the information can be used for planning of nutrition programmes. The information obtained from this assessment question will be compared with the ranking categories of nutrition programmes in the respective districts as all districts in Zambia are required to include nutrition activities in their district annual plans as well as use of nutrition information. Table 16 provides a list of childhood illnesses that health personnel think contribute to malnutrition

**Table 16: Knowledge of Childhood Illnesses Contributing to High levels of Malnutrition in Zambia**

Childhood Illness	Proportion of Health Personnel with Knowledge of Childhood Illness Contributing to Malnutrition		
	Yes N=102	No N=102	Don't Know/Missing N=102
Malaria	78%	10%	12%
Diarrhoea	92%	1%	7%
Measles	80%	15%	5%
Pneumonia	66%	20%	14%
T.B	88%	7%	6%
Worm Infestation	95%	1%	4%

Table 16 indicates that 95% of health personnel knew that worm infestation contribute to malnutrition. The least childhood illness known by health personnel was pneumonia (66%)

#### **4.2.2 INFORMATION ON ATTITUDE ABOUT NUTRITION SURVEILLANCE**

**Objective 3:** *To explore the attitudes of district health personnel about nutrition surveillance.*

A few questions have been asked to determine the attitude of district health personnel about nutrition surveillance programme. The questions were asked on usefulness of nutrition data collected and reasons to the respective responses. However, it should be noted that the attitude questions were not of much help as most of the responses were very similar.

##### **Usefulness of Nutrition Data Collected**

Health personnel were asked to determine if the nutrition data collected in their respective districts was useful. This question was aimed at determining the attitude of health personnel about nutrition data that is collected in their respective district.

Out of the 102 health personnel 95(93%) mentioned that nutrition data collected by the programmes was useful.

### **Analysis of Attendance to a Training Workshop and Use of Nutrition Data**

Table 17 highlights the relationship between attendances to training workshop and ability to use nutrition data.

**Table 17: Analysis of Attendance to a Training Workshop and Use of Nutrition Data**

<b>Attended Training Workshop</b>	<b>Use of Nutrition Data</b>		<b>Total</b>
	<b>Yes</b>	<b>No</b>	
<b>Yes</b>	72	1	73
<b>No</b>	24	1	25
<b>Total</b>	96	2	98

The results of the analysis in table 17 indicate that health personnel that have attended a training workshop are more likely to use nutrition data.

RR(exposure: training =+; outcome: use of data=+) 1.03 with confidence limits (0.94 - 1.12). Relative Risk is above 1.



### **Usefulness of Nutrition Data Collected by Health Personnel**

Health personnel were asked to indicate if nutrition data is useful in nutrition programmes. Figure 4 illustrates percent of responses.

**Figure 4: Usefulness of Nutrition Data Collected by Health Personnel**

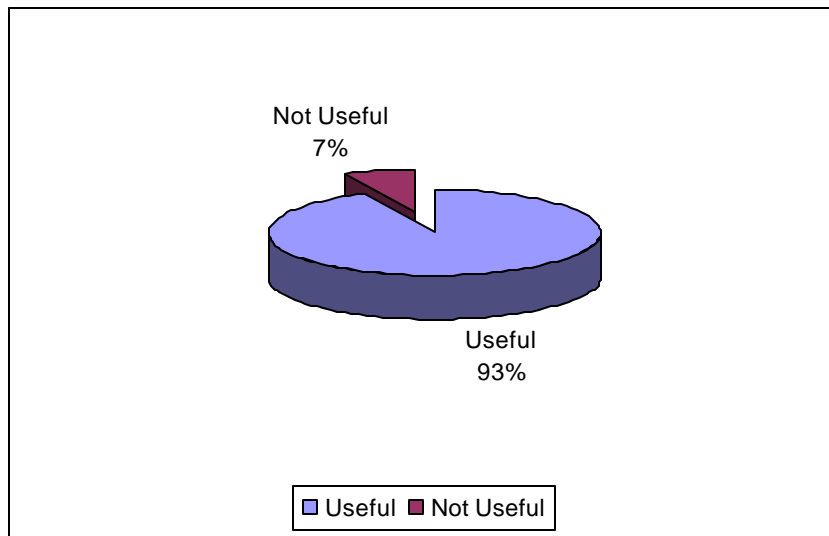


Figure 4 indicates that 93% of health personnel mentioned that nutrition data is useful in nutrition programmes.

### **Usefulness of Nutrition Data to Nutrition Programmes**

Two responses to determine how useful nutrition data and information is to nutrition programmes were provided to health personnel. This question was aimed to analyzing the usefulness of nutrition information to the ranking priority

of nutrition programmes in the districts. The ranking priority of nutrition programmes in the district serves as a proxy measure of usefulness of nutrition data and information. Table 18 highlights the usefulness of nutrition data and information in the districts.

**Table 18: Usefulness of Nutrition Data to Nutrition Programmes**

<b>Usefulness</b>	<b>Frequency</b>	<b>%</b>
Very useful	67	71
Useful	28	29
<b>Total</b>	<b>95</b>	<b>100</b>

Table 18 reveals that out of the 95 (in figure 4) that acknowledged that nutrition data is useful, 71% mentioned that it was very useful.

### **Reason's Given For Their Responses**

Furthermore, the health personnel were asked to give reasons on the responses that they indicated in table 18. The purpose of this qualitative data was to compare the information obtained with the focus group discussion information.

Reasons given to the above responses were as follows:

**Very Useful:** (N=68) nutrition data was very useful in requesting for supplemental feeds from the World Food Programme (WFP) (47%); in planning

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for programme (18%), requesting for funds from the CBOH (35%) to carry out outreach activities for nutrition programmes.

**Useful:** (N=27) nutrition data and information was useful in planning nutrition programmes (63%) and requesting for funds for supplemental feeding (37%).

**Not useful:** (N=7) No reason was given this response.

#### **4.2.3 INFORMATION ON PRACTICES OF HEALTH PERSONNEL ABOUT NUTRITION SURVEILLANCE**

**Objective 4:** *To establish the practices of district health personnel about nutrition surveillance.*



A few questions have been asked to determine the practices of district health personnel about nutrition surveillance programme. The questions were asked on, use of nutrition data collected, ranking priority of nutrition programmes in their respective district annual plans, health personnel's role on information cycle and sharing of information among staff.

##### **Ever used Nutrition Data**

Out of the 102 participants 97 (95%) indicated using nutrition information, 2 (2%) missing data and 3(3%) did not use nutrition information.

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### Use of Nutrition Data

Health personnel were provided with a list of uses of nutrition data. They were asked to tick all the responses that were applicable in using nutrition data.

**Table 19: Use of Nutrition Data**

Use	Frequency (N=97)	%
Planning	97	100
Requesting for Supplies	90	93
Requesting for funds	69	71
Send it to central level	71	73



Table 19 indicates that all health personnel that use nutrition data use it for planning, only few health personnel use it for requesting funds.

### Ranking Category of Nutrition Programmes in Districts

A list of responses to determine the priority ranking category of nutrition programmes in the selected districts was provided for health personnel to select a category that suited their respective districts, table 20.

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**Table 20: Ranking Category of Nutrition Programmes in Districts**

<b>Rank</b>	<b>Frequency</b>	<b>%</b>
Top 5	33	32
Top 10	50	49
Below 10	12	12
Missing	7	7
<b>Total</b>	<b>102</b>	<b>100</b>

Table 20 indicates that only a third (32%) of health personnel ranked nutrition programmes in the top five categories of health programmes in their district annual plans.



### **Role of Health Personnel in Handling Nutrition data**

This analysis determines the categories of health personnel's role in handling nutrition data. This information is useful in targeting different orientation workshops and training programmes for the health personnel.

**Table 21: Role of Health Personnel in Handling Nutrition data**

Category of Health Personnel	Frequency (N)	Roles Of Health Personnel				
		Collecting n(%)	Checking errors N(%)	Data entry n(%)	Analysis n(%)	Printing information n(%)
Nutritionist	11	82	73	27	27	27
Public Health Nurse	8	63	63	0	75	25
Nurse MCH Coordinator	20	60	35	0	10	5
Information Officer	20	95	95	100	100	95
Planning Manager	19	0	53	0	89	27
Clinical Care Specialist	10	30	0	30	60	20
Others	14	64	43	28	21	14
<b>Total</b>	<b>102</b>	<b>56</b>	<b>54</b>	<b>29</b>	<b>56</b>	<b>32</b>

Table 21 indicates the different roles of health personnel in handling nutrition data. More than 95% of information officers indicated that they were involved in all activities of handling nutrition data. Nutritionists seem to be actively involved in collecting data and in checking errors, public health nurses and planning managers in analysis. The involvement of the remainder of personnel varies.

### **Sharing of Nutrition Information with Other District Staff**

A question was asked to determine if health personnel shared nutrition information among staff in their respective districts, table 22.

**Table 22: Sharing of Nutrition Information with Other District Staff**

Category of Health Personnel	Frequency (N)	Health Personnel Sharing Nutrition Data with Other District staff	
		Yes	%
Nutritionist	11	9	82
Public Health Nurse	8	3	38
Nurse MCH Coordinator	20	8	40
Information Officer	20	17	85
Planning Manager	19	18	95
Clinical Care Specialist	10	5	50
Others	14	3	21
<b>Total</b>	<b>102</b>	<b>63</b>	<b>62</b>

Table 22 indicates that a large percentage of information officers; and planning managers and nutritionists seem to share information with other staff in the district. Only small numbers of the “Others” categories share information with other staff in the districts.

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## **CONCLUSION**

The questionnaire demonstrated that health personnel had knowledge of what nutrition surveillance. The questionnaire identified gaps in interpretations and calculations of indicators by health personnel. In addition, the questionnaire identified that nutrition information was used in planning, and requesting of supplies.

Data from the focus group discussion will now be presented in the following section.





### 4.3 FOCUS GROUP DISCUSSION

A focus group discussion was used to collect information on perception and practices of health personnel about surveillance. The following questions were discussed:

- “What does surveillance mean to you in terms of collecting, interpreting and utilization of information?”
- Are you happy with your involvement in the programme in terms of the knowledge and skills you have?
- What are some of the challenges you are faced with in your daily activities?
- What are some of the improvements you would like to see in the programme in terms of data collection, analysis and utilization.”

A total of 12 health personnel were invited to participate in the focus group discussion. Only 8 turned up and participated in the focus group discussion. These were nutritionists, MCH co-ordinators, information officers; and clinical care specialist from 4 districts. These categories of personnel were specifically invited because they results in the questionnaire reflected that they had positive attitudes towards nutrition surveillance. Information collected was transcribed and summarised according to the contents of the questionnaires.

### **Definition of Surveillance**

The question “What does surveillance mean to you in terms of collecting, interpreting and utilization of information?” This question was asked in order to validate the information given in the questionnaire.

Two responses were given. The first response given was the definition. Half of the participants agreed that:

*“Surveillance means watching over something or to monitor something so that you can get all the information you need, in surveillance you collect, analyse and interpret the information and make sense out of it”*



The remainder of the participants mentioned that data is collected in order to plan and monitor programme implementation as an evidence of utilization of funds.

*“We collect data to monitor progress on our activities. For example, data from the Health Management Information System (HMIS) is normally used for planning activities for child health where nutrition activities are found.”*

## Perception of Nutrition Information

Participants were asked if they were happy with the way nutrition data was collected.

Some felt that they were happy with the data as they only collect what is requested.

*“We collect information that is requested, there is no need to add some more from our district otherwise we will be the only ones collecting the data, we are happy about our work so far.”*



A few participants mentioned that the information that is collect does not take a long time to collect and send of to Lusaka. There is not much work involved.

*“the checklists and return forms are easy to use and we send them off to Lusaka after filling in the data on the forms.”*

Those who were not happy mentioned that the data was sent to the central level and that the central level personnel do not send reports back to the districts in order for districts to know what the situation is on the ground.

*“We are half placed (between the central and the district level), we send reports to Lusaka and there is no feedback our directors want to know the result of the data and we do not know.”*

While few personnel mentioned that the anthropometric indicator that is collected, weight for age, measures underweight. Currently, the biggest problem in Zambia is stunting. The stunting indicator is not collected using the system under the ministry of health.

*“Our biggest problem in Zambia is stunting and not underweight, why do we collect underweight coverage instead of stunting to be useful in programme planning?”*

### **Challenges Encountered**

The following are the challenges that are encountered in collecting, interpreting and utilizing nutrition data.



#### **1. Collection of Data**

The participants expressed unhappiness in the way nutrition data is collected. Data is collected from health centres at district levels and is sent to national level. Not all indicators are required at national level as the design of the system gives emphasis on use of data at district level, hence not all indicators are sent to national level.

*“We do not understand why we collect the data that we do not send to national level for example, we have the child registers that we record information from the community level, but the information is not sent to national level.”*

In addition, participants mentioned that there is a lot of information at national level, with each programme collecting and keeping its information that is not being used. However, the acceleration of the micronutrients programmes has introduced information that can be collected, and used by the districts before each supplementation round.

*“A lot of information is collected, we do not know how it is used since the collection is done by different nutrition programmes”*

*“The micronutrients programme indicators collected are good; we have no problems in collecting it because we have seen it being used even in our offices.”*



In terms of knowledge, the health personnel mentioned that they knew what was supposed to be collected because the information is designed from central level. There have been a few workshops that the participants have attended and were trained to collect different data using different forms.

*“We know what to collect because we have attended workshops where we were taught on what to collect”*

*“Collection of data, its no problem, the problem comes when we want to interpret the data so that we can use it not just in requesting for supplies and funds, we want to know what other things we can use the data for”*

## 2. Interpreting and Utilization of Nutrition Data

Interpretation and use of nutrition data were identified to be complementary.

The participants expressed lack of skill in interpreting nutrition data.

*“All we do is collect data and calculate the coverage we do not know what to do next.”*

*“Some programmes do not have programme targets that we can work with to know how we are performing, at least for the supplementation programme we are told to reach above 80% coverage of the children, that is better because without such targets we can not know our performance from the data that we collect.”*



The majority of the participants mentioned that lack of good use of data is a result of lack of interpretation skills.

*“We just plan in our heads on what is interesting, and what the central level wants, we do not use data to plan in our district plans ,”*

*“If you can not use a fishing rod, you can not catch fish, in the same way if you do not know how to interpret data, how can you use it?”*

The only feasible use of data that was mentioned among the participants was supplemental feeds from the World Food Programme. Fund and

supplies did not seem to be a problem as most nutrition programmes would still need them.

*“Funds for programmes are not something that we use data for, as we need funds anyway, this includes supplies that we get, the only data that we have used is the underweight coverage to request for food supplements from WFP.”*

Lack of data management skills were mentioned as one of the contributing factors to lack of interpretation and use which later led to poor programme management.

*“We have examples of programmes that have problems with managing data e.g the GMP programme, but some of them like the supplementation programme is well managed because data is used, that is what the central level people want”*

*“Some times we collect data without knowing what to look for.”*

### **Suggested Improvements to the Surveillance Programme**

Participants were asked about some of the improvements they would like to see in the programme in terms of data collection, analysis and utilization. Participants suggested the following:

## **Data Collection**

The group mentioned that, nutrition indicators need to be redefined.

*“We need to redefine the purpose of the indicators and some of the information that is collected in our districts, especially the ones that we are not sending to the central level.”*

A few mentioned that they would like to have feedback from the central level on the information that is collected.

*“We want feed back. How do we know that we are on the right track?”*

## **Data Analysis and Utilization**



The group mentioned that data analysis and utilization go together. Data analysis was a major problem among the health personnel. The health personnel identified the issues of capacity in data analysis, interpretation and use.

*“We all need to know how to analyse and interpret our own programme data that we collect and not only the information officer.”*

*“If we do not know how to analyse data how do we use it?”*

A few members of the group mentioned that the dissolution of the Central Board of Health is seen as an opportunity to influence what nutrition data can go in the new data set for nutrition programmes.



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*“This is an opportunity for us to include other indicators of nutrition in the HMIS since it is the major information system, that way we can reduce on the politics that go on when we do our supplementation round”*

The approval of the nutrition policy has also been seen as an opportunity to improve nutrition monitoring and implementation.

*“Now that the long awaited nutrition policy has passed, it is time for us now to ensure that we have a better information system that will monitor the nutrition situation on the ground, improve capacity issues, funding, analysis and interpretation so that we use the data appropriately.”*

## **CONCLUSION**



The focus group discussion demonstrated knowledge of what nutrition surveillance is. It also identified problems and frustrations that the staff is faced with in implementing the nutrition surveillance system, such as not being able to interpret and use data that they collect. They also expressed frustration by lack of feedback about data they send to the central level.

## CHAPTER 5

### DISCUSSION, LIMITATIONS, RECOMMENDATIONS AND CONCLUSION

#### 5.1 DISCUSSION

This section discusses the interpretation of the findings. The presentation of the discussion follows the sequence of the study methods. The study limitations, recommendations and conclusions are also presented.

The study found that the implementation process of nutrition surveillance in Zambia is similar to the information system implemented in Nicaragua (Alvarado *et al*, 2002). The system has different levels having different functions. Each level has tools and indicators required for implementation at particular levels. These structures and functions; and the way each members of the structure interacts and functions is similar to that identified by Braa, (1997) who reported the different structures and functions of an information system. The study also found that the surveillance system is implemented by different institutions according to its primary mandate. In each institution, at programme and or district level activities undertaken are monitoring and evaluation of programmes. These findings are comparable to the findings of Pelletier (1995) in the Iringa nutrition programme who reported the roles of different levels involved in

nutrition information systems. At national level nutrition surveillance as defined by Mason, *et al*(1984) deals with aggregated data for large populations. The activities that take place at this level are collection of data from the district level, analysis and interpretation of data which is essential in planning, implementing and evaluation of national public health programmes and dissemination of information to policy and decision makers. The functions of this level are similar to CDC (2001) and Davids (2001) who reported the functions of surveillance as data collection, analysis, interpretation and dissemination of information to those that need to know. The surveillance programme in Zambia has utilised decision makers in order to improve delivery of nutrition programmes. This is reflected in the results obtained in decision making at policy level.



The study found that the knowledge of personnel about the surveillance system was high with more than 72% of health personnel knowing the activities involved in nutrition surveillance. Being the first study of this kind in the country, it is very difficult to compare within the country what other findings have found. The information was therefore not very useful to the study as all the responses were similar among the health personnel. This could be due to the fact that the health personnel have a theoretical knowledge due to the trainings that they have attended. It may also be due to the way the questions were asked, that is use of closed ended questions in the questionnaire, inability of the questionnaire to check for honesty of the respondents resulting in collection of superficial information. The analysis of the results has been easy while interpretation of the findings has

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become problematic. The experience encountered using this type of questionnaire has been documented by Robson (1993) and in his publication, “interviews and questionnaires, the real world research” and by Kellehear (1993) in his publication “rethinking the survey.” The two authors mention that self administered questionnaires experience collection of superficial and non-participative data that is easy to analyse while interpretation can be difficult and should be done with caution. Furthermore, Robson (1993) mentions that while good questionnaire planning can increase the response rate for questionnaires, the basic point is that we have little or no knowledge about the views and characteristics of those who do not respond to some questions which can seriously vitiate any claims to generalise results. Kellehear (1993) reveals that the questionnaires impose structure rather than allowing the subject to display their own meaning and knowledge. The above limitations by both Robson and Kellehear have been experienced in this study.

Although nutrition surveillance consist of five types of information system which include the health management, financial management, the expanded programme on immunization, the nutrition surveillance and the anti retroviral therapy information systems only two systems were known by health personnel. These were the Health Management Information System (HMIS) and Nutrition Surveillance (NS). This is because the two systems are commonly used to collect information for nutrition programmes.

About 72% of health personnel had attended information system training. The findings of the study are not similar to Bloem and de Pee (2001) where it was reported that only a third of the public health staff in the Philippines micronutrients programme had not received orientation on the programme. The difference in the study might be that the Philippines study targeted all health personnel while the current study targeted personnel with responsibility in nutrition data and information systems.

Not all health personnel could give a correct explanation of how to calculate the underweight and vitamin A supplementation coverage. Knowledge of district coverage is important because personnel are able to determine how well the district is performing with the set targets for the programmes. In addition districts are able to compare their performance with other districts within the province. These findings explain why data from the district is wrongly calculated. This may be due to lack of numeracy skills which is a problem with people who did not take mathematics as a subject in school. Calculations of indicators have also been found to be a problem among health personnel that have not been trained in calculation of indicators (CBOH, 2003). Although a large percent of participants had attended information system training, one has to question the method used to teach these people whether they received theory training without practical applications or perhaps they just do not understand what is being taught. This suggests further research to determine if people understand what is being taught in these courses or not.

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The findings of the study are similar to Philips-Howard *et al* (1980) in a study that validated malaria surveillance case reports and implications of malaria risk factors. The authors found that only 65% of health personnel were able to calculate indicators required in the malaria surveillance. In another study by Emori *et al* (1998) only 62% of health personnel were able to give accurate calculation of reporting nosocomial infections in intensive care unit to the National Nosocomial Infections Surveillance System pilot study.

In the questionnaire a large percentage of personnel mentioned that they use information for planning interventions but from the focus group discussion participants mentioned that they were unable to interpret data and therefore could not use data for planning interventions. This could be a methodological issue as the focus group revealed the truth while in self administered questionnaires people give responses that they think will please the researcher. The experiences encountered in this study with using a self administered questionnaire has also been experienced by Zimet, *at al* (1997) who used a self administered questionnaire and focus group discussions to determine the knowledge, attitudes and health beliefs and intention to get immunized for HIV among adolescent girls and boys. The study found that information collected using the questionnaire on knowledge of HIV and immunization was very high while the focus group revealed little knowledge about HIV and immunization.


Sixty three percent of the personnel mentioned that nutrition data was useful in planning nutrition programmes. District staffs are required to plan for different health programmes in their districts. One way of ensuring that nutrition data is used for planning nutrition programmes is to determine the ranking category of nutrition programmes in the districts. The study revealed that 32% of health personnel ranked nutrition programmes in the top 5 priority programmes in their respective district action plans. In addition, the study found that only nutritionists shared information among the health personnel. This is a shortcoming because for a programme to be effective all programme participants should be familiar with what is happening in the programme. Unfortunately this study did not collect information about the frequency of information sharing and methods used for sharing information in the districts.



When health personnel were asked about their involvement in health information system, the majority mentioned that they were involved in data collection. This means that half of the health personnel collect data as their primary role in information system. They therefore cannot share the information if they do not know what the information means.

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The current study found that health personnel that participated in an information system training had positive attitudes and were more able to calculate nutrition indicators.

This has also been documented in the study by Marjolein, *et al* (2001) in a study on attitudes and motivation of health staff in the Northern Vietnam. The Vietnam study found that positive attitudes of health personnel resulted in good performance in delivery of health services. However, the major problem encountered was lack of involvement in analysis and interpretation data which led to lack of information use and poor information management. This has also been documented by Urban (1995) in his review on planning for nutrition surveillance and by UNICEF (1992) in the  review towards an improved strategy for nutrition surveillance, as inability to analyse data as one of the factors that have affected the implementation of nutrition surveillance programmes.

Successful programme have documented the use of a triple A approach in designing programme. This means that health workers involved at all levels of the programme should take part in planning and implementing nutrition interventions. This will ensure skill development, ownership and cooperation of all personnel involved (Jennings *et al*, 1991). In the nutrition surveillance programme in Zambia, the programme could have been introduced to the people through training and were not part of the planning process. The training may not have



been adequate to equip the health workers with proper skills needed to be able to interpret data, or the health personnel do not feel that they own the programme therefore they lack commitment to want to learn more about their work. Urban (1995) indicates that successful use of nutrition information requires explicit conceptual framework representing the best available judgment of the causes of malnutrition in a given setting. At personnel level, erroneously equating growth faltering with inadequate access to food may result in GMP programmes whose only link to action is through supplementary feeding programmes. This action has also been found in this study where the only visible action in by health personnel was supplementary feeding programme.

The implication this has on the nutrition programmes is that when health personnel can not interpret data, they can not use it in decision making at individual level or in planning nutrition programmes at district or national level.

This means that:

- At personnel level children who are beginning to falter in growth run the risk of not being identified because early detection of growth faltering by health personnel will be poor resulting in progression from mild and moderate malnutrition to severe malnutrition and death (Pelletier, 1995). Kawana (2004) reported that in Lusaka most children progress to severe malnutrition because the health workers are unable to detect mild malnutrition in order to give appropriate advice to mothers to avoid severe malnutrition. This inability of health personnel to identify growth

faltering children could be a result of health personnel's inability to understand and interpret nutrition indicators, such as the meaning of below 50<sup>th</sup> percentile.

- At district and national level, inability of health personnel to interpret nutrition indicators leads to poor planning and implementation of nutrition programmes resulting in continued high levels of poor nutrition.

Findings on what nutrition surveillance and health management information systems includes and; the use of nutrition data by health personnel might not reflect what health personnel know as the health personnel might have been influenced by the responses given in the questionnaires; in some cases the responses were very similar in all questionnaires. The interpretations of these results need to be done with caution or in combination with the focus group discussion responses.

The focus group discussions also revealed that health personnel were concerned about the fact that the nutrition information system collected data on “weight for age” which was not very useful for nutrition programmes as the biggest nutritional problem in Zambia was stunting and not wasting. The findings are similar to the study documented by Sanders and Chopra (1997). The authors pointed out that the underweight indicator alone was not very useful in planning nutrition interventions as the biggest nutritional problem was stunting, which is an indication of chronic nutrition. The authors however mentioned that it was

difficult to train personnel to collect accurate height measurements as well as to make logistical arrangements for collection of height data. This may also explain why height for age indicator is not used in Zambia for passive surveillance.

## **5.2 LIMITATIONS OF THE STUDY**

In this study, the following problems were encountered using the self administered questionnaire:

- Literature search did not find studies on evaluation of nutrition surveillance specifically on knowledge, attitudes and practices of health personnel about nutrition surveillance to draw lessons from as well as to compare findings. Literature that has been reviewed focused on analysis of anthropometric data collected by the programme as well as a focus on mothers and caretakers on the programme.
- Data was not collected on the support available to personnel after training. This issue may also influence the performance of the health personnel

#### 5.4 RECOMMENDATIONS

These recommendations are aimed at improving nutrition surveillance system in Zambia. The study recommends that there is need:

- To look at the training method used and support available after the training to encourage use of information in planning of interventions,
- Developing capacity among the district staff in interpretation of data so that information collected is utilized appropriately,
- The central level to give feedback to districts on the information collected,
- Programme targets to be developed to help the districts in assessing the district performance.

#### 5.4 CONCLUSION



The study has identified factors associated with inability to use data collected through nutrition surveillance by health personnel. Although health personnel seem knowledgeable about nutrition surveillance concepts, and about the importance of the surveillance system, they were frustrated about the fact that they could not analyse and interpret the numbers they collected. This has led to poor usage of information in decision making and in planning appropriate interventions.

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## APPENDIX 1: SELECTED DISTRICTS BY PROVINCE

The following districts were selected from the following provinces:

Province	Number of Districts In Province	Number Selected	Names of Selected Districts
Central Province	6	2	Chibombo and Serenje
Copperbelt Province	9	3	Chililabombwe, Kalulushi and Luanshya
Eastern Province	8	2	Chipata and Lundazi
Luapula Province	7	2	Mansa and Samfya
Lusaka Province	4	1	Lusaka
Northern Province	13	5	Kasama, Luwingu, Mbala, Mpika and Mporokoso
North-Western Province	7	2	Solwezi and Kasempa
Southern Province	11	3	Sinazongwe, Siavonga and Gwembe
Western Province	7	2	Sesheke and Kaoma

## **APPENDIX 2: RECORDS REVIEWED**

The following records were reviewed:


### **Ministry of Agriculture and Cooperatives**

Famine Early Warning System  
Annual Reports (2000 to 2003)

### **Central Statistical Office**

Food Health and Nutrition Information System monthly bulletin (1991 to 2004)  
Living Conditions Monitoring Programme  
Demographic and Health Survey  
CSO annual report  
Priority Survey I, II

### **Ministry of Health**

Ministry of Health Reforms Concept 1995  
Annual Report 2000, 2004  
Health Information System  
Memorandum of Understanding Between  NFNC and MOH on Nutrition Programmes

### **National Food and Nutrition Commission**

Micronutrients Monitoring indicators: for Implementation during the Child Health Week, 2003  
Implementation Experience of the Growth Monitoring Programme in Zambia: 1975 to 1995  
Monitoring of the Micronutrients Programme in Zambia  
Baby Friendly Hospital Initiative in Zambia  
GRZ, 2004 Zambian Nutrition Policy  
GRZ, 2004. Resonal Food and Nutrition Commission in Zambia

### **Central Board of Health**

Health Management Information System  
Health Strategic plans  
District Annual Health Plans

### **Ministry of Commerce Trade and Industry**

Companies Targeted for fortification Programme in Zambia  
Monitoring of fortified foods: Borders, Factories and Central laboratories in Zambia

### **Ministry of Finance and Economic Development**

GRZ, 2005. 5<sup>th</sup> National Development Plan (2006-2011)

**APPENDIX 3: QUESTIONNAIRE ON KNOWLEDGE ATTITUDE AND PRACTICE OF DISTRICT HEALTH PERSONNEL ABOUT NUTRITION SURVEILLANCE PROGRAMME IN ZAMBIA**

**INSTRUCTIONS TO THE RESEARCH ASSISTANCE:**

1. Please attach this form after the Health Personnel have completed filling the Form.
2. Please check all questions to ensure that all the responses are in place.

Questionnaire Number: \_\_\_\_\_

Province: \_\_\_\_\_

District: \_\_\_\_\_

Date of Data Collection: \_\_\_\_/\_\_\_\_/\_\_\_\_  
DD MM YY

Name of Research Assistant: \_\_\_\_\_



Are all responses filled in?

1. Yes
2. No

If no, give reasons for not filling in all the Responses:

\_\_\_\_\_

**Data Entry Check List**

- |                             |        |
|-----------------------------|--------|
| 1. Is coding complete       | 1. Yes |
|                             | 2. No  |
| 2. Is questionnaire entered | 1. Yes |
|                             | 2. No  |



**QUESTIONNAIRE ON KNOWLEDGE ATTITUDE AND PRACTICE OF  
DISTRICT HEALTH PERSONNEL ABOUT NUTRITION SURVEILLANCE  
PROGRAMME IN ZAMBIA**

***INSTRUCTIONS TO THE HEALTH PERSONNEL***

1. Please fill in all the responses to all the questions
2. The >> sign means go to next question

1. Sex of the health worker

1. Male
2. Female

2. What is your profession

1. Nutritionist
2. Public Health Nurse
3. Nurse MCH coordinator
4. Information officer
5. Planning Manager
6. Clinical Care Specialist
7. Others (specify): \_\_\_\_\_



3. How long have you been working in this position?

1. less than 3 years
2. 4 to 6 years
3. 7-10 years
4. above 10 years

4. Nutrition surveillance includes? (*please circle all applicable responses*):

- |                    |        |       |               |
|--------------------|--------|-------|---------------|
| 1. Data collection | 1. yes | 2. no | 3. don't know |
| 2. Accuracy checks | 1. yes | 2. no | 3. don't know |
| 3. Data analysis   | 1. yes | 2. no | 3. don't know |
| 4. Reporting       | 1. yes | 2. no | 3. don't know |
| 5. Planning        | 1. yes | 2. no | 3. don't know |
| 6. Advocacy        | 1. yes | 2. no | 3. don't know |

5. Health management information system includes? (*please circle all applicable responses*):

- |                    |        |       |               |
|--------------------|--------|-------|---------------|
| 1. Data collection | 1. yes | 2. no | 3. don't know |
| 2. Accuracy checks | 1. yes | 2. no | 3. don't know |
| 3. Data analysis   | 1. yes | 2. no | 3. don't know |
| 4. Reporting       | 1. yes | 2. no | 3. don't know |
| 5. Planning        | 1. yes | 2. no | 3. don't know |
| 6. Advocacy        | 1. yes | 2. no | 3. don't know |

6 Please name types of information systems that you are familiar with?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

7. Have you ever attended an information system orientation?

1. Yes
2. No >> go to quest. 10



8. List the information system orientations that you have attend?

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_

9. What was the focus of each of the orientations attended above (*please circle all applicable responses*):

**Orientation a:** 1. Data entry 2. Data interpretation 3. Data use 4. others

**Orientation b:** 1. Data entry 2. Data interpretation 3. Data use 4. others

**Orientation c:** 1. Data entry 2. Data interpretation 3. Data use 4. others

**Orientation d:** 1. Data entry 2. Data interpretation 3. Data use 4. others

10 Could you please provide interpretation to the following indicators:

1. Weight for age: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. What does it mean when a child's weight is above the 50<sup>th</sup> percentile, the upper line on the children's clinic card?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. What does it mean when a child's weight is below the 60<sup>th</sup> percentile, the lower line on the children's clinic card?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

11 What is the proportion of the following age groups in your district catchments population:

a. under 6 months: \_\_\_\_\_

b. under 1 year: \_\_\_\_\_

c. under 5 years: \_\_\_\_\_

d. 6 months to 5 years: \_\_\_\_\_



12 Please provide an *explanation* of how you would calculate the following coverage's for the following child health programmes in your district:

1. Underweight coverage: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. Vitamin A capsule supplementation coverage: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. De-worming coverage: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

13 Do the following childhood illness contribute to high levels of malnutrition in Zambia?

- |                     |        |       |               |
|---------------------|--------|-------|---------------|
| 1. Malaria          | 1. yes | 2. no | 3. don't know |
| 2. Diarrhoea        | 1. yes | 2. no | 3. don't know |
| 3. Measles          | 1. yes | 2. no | 3. don't know |
| 4. Pneumonia        | 1. yes | 2. no | 3. don't know |
| 5. T.B              | 1. yes | 2. no | 3. don't know |
| 6. Worm Infestation | 1. yes | 2. no | 3. don't know |

14 Is the nutrition data collected by the programme useful?

1. yes
2. no

15. How useful is it to the programme?

1. Very useful
2. Useful
3. Not useful
4. Not very useful
5. Don't know



16. Give reasons to your response above:

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_

17 Have you ever used nutrition data?

1. Yes
2. No *if no >> to quest. 19*

18. What did you use the nutrition data for?

- |                             |        |       |
|-----------------------------|--------|-------|
| 1. Planning                 | 1. Yes | 2. No |
| 2. Requesting for supplies  | 1. Yes | 2. No |
| 3. Requesting for funds     | 1. Yes | 2. No |
| 4. Send it to central level | 1. Yes | 2. No |
| 5. Nothing                  | 1. Yes | 2. No |
| 6. Others (specify): _____  |        |       |

19. Which ranking category does nutrition programme fall in your 2005 districts annual plan?

1. Top 5
2. Top 10
3. Below 10

20. What is your role in handling nutrition data

- |                             |        |       |
|-----------------------------|--------|-------|
| 1. Collating nutrition data | 1. Yes | 2. No |
| 2. Checking for errors      | 1. Yes | 2. No |
| 3. Data entry on computer   | 1. Yes | 2. No |
| 4. Analysing data           | 1. Yes | 2. No |
| 5. Printing out graphs      | 1. Yes | 2. No |



21.

Do you share nutrition information with fellow staff members?

1. Yes
2. No

**THANK YOU FOR FILLING IN THE QUESTIONNAIRE**

## **APPENDIX 4: FOCUS GROUP DISCUSSION GUIDE**

The questions “

- What does surveillance mean to you in terms of collecting, interpreting and utilizing information?
- Are you happy with your involvement in the programme in terms of the knowledge and skills you have?
- What are some of the challenges you are faced with in your daily activities?
- What are some of the improvements would you like to see in the programme terms of data collection, analysis and utilization?

*Reflexive statements will be used to encourage the discussion; these will focus on data collection, interpretation, and utilization*



**THANK YOU FOR YOUR ASSISTANCE AND ATTENTION**

**APPENDIX 5: CONSENT FORM**

This study is being conducted by Ms Mwela a student at the University of the Western Cape in Cape Town, South Africa currently perusing her Masters in Public Health at the Department of Public Health.

This study is focusing on nutrition surveillance that is being implemented by district level health personnel. You have been identified as a key participant to this study. A questionnaire will be used to collect information from you. You are free to choose to participate or not. If you choose to participate or not to participate, your professional reputation will not be affected. In addition, your name will not be required to be indicated on the questionnaire.

The findings of the study will be used to make recommendations to improve the operations of the nutrition surveillance programme.



Do you voluntarily consent to participate in this study?

- 1. Yes
- 2. No

Thank you very much

.....

If you chose to participate in the study please sign below.

I chose to participate in the study.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_