THE EFFECTS OF RESOURCE FLOW TO THE PRINCESS MARIE LOUISE HOSPITAL ON THE LENGTH OF STAY OF MALNOURISHED CHILDREN.

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DEDICATION

This work is dedicated to Dr.E.A. Afari, and Dr. H.E. Jackson, whose supervision simply kept my interest in the work at a time when I wanted to forget about it all.

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DECLARATION

I hereby declare that this work is, with the exception of specified sections which have been duly acknowledged, entirely my own and constitutes the genuine task I set myself.

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PREFACE

Malnutrition is a very serious problem in the developing world which continues to kill numerous infants and children without much notice from the community. Unlike the six childhood killer diseases which have been identified and for which so much resources have been amassed to combat on a very wide scale, malnutrition is yet to receive this international and domestic awareness for full scale control and later eradication.

This study takes a snap shot picture of the Princess Marie Louise (P.M.L.) Hospital in Accra, where the tip of the iceberg of the problem of malnutrition is catered for mainly through food and drug therapy.

The study also reviews the pattern of management of the Ministry of Health hospitals showing some inadequacies and how it needs restructuring to give a high sense of autonomy to the various Management Boards of the hospitals to permit them to do their work more effectively and conscientiously.

In view of the numerous problems which were unravelled during the study, suggestions in the form of recommendations were made with the view of improving the health administration of hospitals as well as improving malnourished child care at the P.M.L.

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ABSTRACT

The Princess Marie Louise Hospital (PML) caters for malnourished children suffering from Kwashiorkor, Marasmus or Marasmic Kwashiorkor with food and drug therapy. All cases admitted are treated with free food nutrients. In addition, drugs which are used as supplements are however paid for by the caretakers.

The main problem that the research seeks to investigate is the frequent inadequacy of its essential supplies namely, food nutrients and drugs, the consumption of which is believed to have a positive relationship with the rate of recovery of malnourished children depending on the quality and quantity provided.

It is therefore hypothesised that, given adequate and timely supply of essential supplies, the length of stay of malnourished children will be inversely related to the flow of the essential items to the hospital.

The results of the study revealed that the average length of stay at the hospital was 35 days, and that mortality among malnourished children averaged between 12 to 15 deaths per month. However, it was realised that most of the cases which resulted in deaths were short stays ranging between 1 and 6 days after admission. The implication was that, the conditions of the children either worsened to their terminal stages before they were admitted to the hospital, or that, they were presented to the hospital at a time

when very little could be done medically.

Information processed from data gathered at the kitchen revealed that there were very wide shortfalls in the records of food items required and those available for consumption. The erratic nature of foodstuffs supplied to the kitchen made it impossible for proper planning and management. Such irregularities which resulted in the malfunctioning of the kitchen further forced the frequent substitution of the meals served without any consideration of the food energy generated from the substitutes.

The study further revealed that though food and drugs could easily be quantified as the most important ingredients influencing the rate of recovery of malnourished children at the PML., other factors which were not easily quantifiable like the medical care, nursing care and the influence of individual caretakers were very important influential factors on the length of stay of malnourished children.,

CHAPTER ONE

1.0 INTRODUCTION AND BACKGROUND INFORMATION OF THE PRINCESS MARIE LOUISE HOSPITAL

The Princess Marie Louise Hospital (PML) is a specialist children's hospital in Accra that mainly cares for malnourished related diseases using food therapy and drugs. The PML was officially commissioned in 1926 and named after Her Royal Highness, Princess Marie Louise, who laid the foundation stone in June, 1925. The Princess Marie Louise Hospital provided Dr. Cicely Williams the opportunity for conducting her pioneering work in nutritional disorders in children. It was through the publication of her work in 1933 entitled "A Nutritional Disorder in Children Due to Maize Diet", that the term Kwashiorkor (a Ga word meaning deficiency in protein consumption) was first introduced in the medical dictionary. The PML again offered the pioneering work of Maternal and Child Health Services (MCH) which became the forerunner for the training of Public Health and Community Health Nurses, formerly called "Female Sanitary Inspectors" in Ghana.

The main function of the hospital as a paediatric institution is the integration of nutritional therapy with other chemotherapy for the quick correction and relief of nutritional deficiencies and acute malnourished diseases. As part of its primary health care programme, the PML educates mothers and child caretakers on nutritional care for the prevention or recurrence of malnutrition among children in the society.

The hospital has a total staff strength of about 146 personnel. There are 3 Medical Officers, 3 Medical Assistants, 1 Pharmacist, and 69 Nurses of various grades from a Principal Nursing Officer (PNO) to Enrolled Nurses. Also included are specialist paramedical staff such as a Nutritionist, Dietitian and a Radiographer. The hospital however has no pediatrician.

Though the hospital appears to be small and occupies an obscured spot, its working schedule is very busy and it takes care of several general medical cases at its Outpatient Department (OPD). The inpatient facilities are generally reserved for malnourished children who suffer from Kwashiorkor, Marasmus, or Marasmic Kwashiorkor. It is however not unusual for certain acute medical cases to be admitted for close observation. Because of its specialised services, the PML receives referral cases from other hospitals making its role very important within the health services of Ghana.

Like any other government controlled hospital in Ghana, the PML has its own institutional problems and those related to the general macro situation prevailing in the country.

The PML is fully government owned and administered through the Greater Accra Regional Medical Office of Health. Administratively, it falls under the Ashiedu Keteke District of Greater Accra Region. It was discovered through the study that several factors combine to determine the rate of recovery of malnourished children

at the hospital. These factors include food, drugs, the care provided by the individual child's caretaker, the quality of nursing and medical care given and the condition of the child before admission. Infact, all these factors are so important that if one of them is absent or inadequate, the recovery rate of the child slows down or the life of the child could be lost altogether.

The hospital has been under incessant pressure of late, from malnourished children basically because the hospital cannot be provided with enough finances to cope with the care of the children in the hospital. In this regard, the rate of recovery of most of these malnourished children is delayed and this places undue pressure on the hospital's resources.

Unfortunately, there has been inadequate and erratic supply of resources which makes proper planning and service delivery difficult to manage in order to ensure optimum child care. This paper seeks to investigate how the rate of flow of resources have been affecting the rate of recovery of malnourished children in the hospital. The investigation will also determine how the hospital acquires its essential supplies, and the ease with which management has been effectively disbursing funds to run the institution.

The hospital has been in existence since 1926 and has been functioning as a research, teaching, rehabilitation and general medical consulting institution in paediatric cases. In recent times

the hospital has become a residential rehabilitation centre, and serves as a referral institution for malnourished children from other institutions throughout the southern part of Ghana. As part of its general paediatric services, the Outpatient Department (OPD) offers general medical and counselling services to the community. The OPD caters for children from three to five years. It operates from Mondays to Saturdays except public holidays, though emergencies are admitted and cared for everyday. The average daily attendance is between 200 and 250 patients, with an average inpatient load of about 35. Mothers who attend clinic at the hospital are educated on several aspects of child and family health matters like proper child care, good nutrition, family planning and a host of other public health needs.

1.1 SERVICES

The Nutrition Division of the Ministry of Health operates a demonstration cooking service which involves teaching mothers how to select the best nutrients for their children, as well as monitoring any signs of malnutrition. This programme does not however constitute a normal part of the hospital services but, an extension of public health care and education to the community.

The hospital has a laboratory that undertakes laboratory services for proper diagnoses of medical cases. The hospital has in addition to its facilities an X-ray diagnostic machine which also facilitates proper diagnoses of patients. The Dispensary of the

hospital is attended by a Pharmacist and Pharmacy Technicians. Another very important department is the Kitchen which provides the therapeutic diets for the detained patients.

1.2 STATEMENT OF THE PROBLEM

The Princess Marie Louise (PML) Hospital, like any other government hospital has its own institutional problems in addition to problems related to the general macro situation prevailing in the country.

Foremost on the list of problems is inadequate funding from the central government and inadequate generation of funds from user charges to run the hospital. Funding is a general problem because what is allocated to the health budget itself is not enough, and thus, all the health institutions have to share an already limited budget. Furthermore, because malnutrition generally afflicts children from poor homes, the hospital cannot generate enough funds from its services to cater for these poor children most of whom were from the economically low income bracket. The question then is " how does the hospital manage its activities with the scarce resources available to correct nutritional related deficiencies in children?". The obvious answer would be for it to compromise quality care due to economic reasons.

The second problem to be investigated is whether the PML actually receives adequate resources in the form of drugs, equipment and food supplies timely to carry out its work. Since the introduction

of the system of cash-and-carry in drug administration, the PML has been affected in its acquisition and dispensing of essential drugs. The problem with drugs now happen to be one of the most important because, unlike the past where mothers could obtain prescribed drugs for their malnourished children free of charge, they now have to pay for it in hard cash. Unfortunately, most of these mothers are from poor backgrounds and can hardly afford their drug bills. This problem becomes more prominent these days because, the supplying institutions like the Central Medical Stores demand full payment before drugs are given out to institutions.

1.3 OPERATIONAL DEFINITION OF TERMINOLOGY

1.3.1 RESOURCES

In this study, the term resources would embody all materials that are needed in the PML for malnourished child care. The materials in this category would be the expendables such as food, drugs, and money.

1.3.2 MALNOURISHED CHILD

This refers to a child presented to the PML with Kwashiorkor, Marasmus, or Marasmic Kwashiorkor.

1.3.3 LENGTH OF STAY

This refers to the number of days that a malnourished child stays in the hospital as an inpatient before discharge.

1.3.4 NUTRITIONAL THERAPY

Any food that is given or eaten with the view to correcting nutritional related disease like kwashiorkor, marasmus and marasmic kwashiorkor.

1.3.5 FLOW

The rate of movement of needed items to the PML and within it, that is, issues from stores to the wards or kitchen.

1.3.6 OBJECTIVES OF THE STUDY

The main purpose of this research is to study how the PML organises its resources and materials to correct nutritional related deficiencies and determine the relationship between food, drugs and the rate of recovery of malnourished children. In this regard, the part played by nutrients, and drugs will be assessed.

1.4 HYPOTHESIS

The hypothesis to be tested by the research is," given the right number of skilled manpower and adequate essential supplies, the length of stay of admitted malnourished children will decrease".

The research is intended to be a descriptive study of an existing situation, involving a review of hospital records followed by interviews of a sample of hospital staff and the caretakers of admitted children.

To be able to test the hypothesis of this research, certain

investigative questions needed to be stated and resolved. For instance, there was the need to determine;

(i) Whether the PML had enough trained personnel like doctors, nutritionists, and nurses to carry out its malnourished child care?

(ii) If the PML received enough essential supplies like nutrients and drugs?

(iii) Whether the essential supplies were received timely and in adequate quantities?

1.5 GENERAL OBJECTIVES

The general objectives of the study are as follows :

(1) To determine the effects of the cash-and-carry system of drug administration at the PML on the length of stay of malnourished children.

(2) To determine the impact of drugs and nutrients on the length of stay of malnourished children.

(3) To determine whether there are any administrative bottlenecks which militate against the efficient operation of the PML.

(4) To determine the utilisation potential of the PML in offering a broader spectrum of general paediatric care throughout its facilities.

1.6 SPECIFIC OBJECTIVES

The specific objectives of the project are to determine:

(1) Whether the cost of drugs prescribed for children imposes an adverse economic effect on caretakers?

(2) Whether children experience prolonged length of stay if their caretakers are unable to buy their prescribed drugs?

(3) The procedures for ordering supplies and materials in the hospital.

(4) The ease with which the management can disburse money to acquire essential items.

(5) Whether the hospital has enough finances to buy all the required drugs that are needed?

(6) Whether the essential drugs are always readily available at the Central Medical Stores?

(7) If it is possible for the PML to extend its facilities to admit and care for more general paediatric cases.

CHAPTER TWO

2.0 THE MANAGEMENT OF THE HEALTH SERVICES IN GHANA

The health service of Ghana is organised through the Ministry of Health, Headquarters in Accra. The political head of the Ministry is the Secretary, who is appointed by the Government.

At the time of the study the technical aspect of the management of the health service was under the administration of a Director of Medical Services, who was assisted by three Deputy Directors in charge of Medical Care, Public Health and Manpower.

The Headquarters in Accra has the responsibility for drawing up broad policies for the operation of the health services in Ghana. Thus, through its policies and guidelines, all government, mission and quasi-government institutions are regulated.

As part of its broad administration, the Headquarters has the responsibility for approving the budgets from the various regions. It undertakes the appointment and placements of trained personnel in the health sector. It further controls all the resources and disburses such essential supplies and equipment like vehicles, drugs, machines to mention a few.

In order to facilitate the smooth administration of the health services throughout the country, attempts have been made to decentralise the health services for efficiency. As a first step, the health services of Ghana, has been divided into 12

administrative regions which coincides with the 10 political regions, while Korle-Bu and Komfo Anokye Teaching Hospitals are considered as two separate regions.

Within each of the ten administrative regions, are separate Districts also having health functions to complement the national goal.

Each region has a Regional Director of Health Service (RDHS) who is the head of the health services in that region. The Regional Director is assisted by a Deputy Director of Nursing Services and a Regional Hospital Secretary.

The Regional Medical Office of Health (RMOH) thus supervises a number of District Health Management Teams (DHMT). The DHMTs coordinate all health activities at the district to the village level.[1]

In line with the implementation of the Primary Health Care Concept, various levels have further been created within the districts to involve communities in the delivery of health service.

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[1] Adibo,M.E.K., Ghana Health In Brief. MOH. 1991. p. 15.

2.1 The Level A

This is found at the community and is the least developed of the health care systems in the country. The health team is made up of Traditional Birth Attendants (TBA), and Community Clinic Attendants (CCA). This is supposed to be the first level of contact with communities which are distant from hospitals in the region or district.

2.2 The Level B

This is the second level in the health system at the peripheral level, that supervises and takes referral cases from the level A. Level B's are sometimes referred to as health posts or health centres. These are staffed by Medical Assistants, Community Health Nurses who do simple diagnoses and treatment of medical cases.

2.3 The Level C

This is the district hospital which is adequately staffed with specially trained personnel like doctors, nurses, pharmacists, radiologists and laboratory personnel. Besides offering supervisory control over levels A and B, the level C's help to plan health activities in the districts and also link up the communities with the Regional health machinery.

2.4 MANAGEMENT OF HOSPITALS

With the exception of Korle-Bu and Komfo Anokye Teaching Hospitals, all other government hospitals operate under Regional Medical Office of Health (RMOH), which is under the administrative authority of a Regional Medical Director, properly designated as Regional Director of Health Services. It is from the Regional Medical Office of Health that all other government health institutions further derive their authority to operate hospitals and other health institutions.

Theoretically speaking, each Medical Officer in charge of a unit hospital is first and foremost accountable to the Regional Director of Medical Services. In the hospital, the ultimate head is the medical officer, who is assisted by the Hospital Secretary and the Principal Nursing Officer. Thus, all correspondence to and from hospitals are addressed and signed in the authority of the Medical Officer in charge.

2.5 REGIONAL ADMINISTRATION

The Regional Medical Office of Health (RMOH) has the responsibility of allocating the Financial Encumbrance to each of the respective institutions under its authority. Thus, the Regional Director's Office collate all budgets and forward them to the Headquarters for approval and onward transmission to the Ministry of Finance and Economic Planning.

The Regional Medical Office on behalf of the individual health institutions appoint staff, particularly senior personnel. Thus, the individual hospitals do not have their own authority to hire, or fire their staff.

Due to governmental regulations in restricting disbursements of funds, the Regional Director is a signatory to the bank accounts of the hospitals. In this regard, even when a hospital administration has sanctioned the purchase or payment of some supplies, the signature of the Regional Director will serve as a final check of authenticity and propriety.

Regarding the acquisition of food supplies for hospital kitchen, the Regional Medical Office acts on behalf of the health institutions to complete tenders through the Tender Board with food contractors.

Other areas where the Regional Medical Office plays a significant role in the administration of hospitals is in the award of contracts which involve capital expenditures. Public funds which are disbursed from the designated Capital Expenditures meant for capital projects require the authorization of the Regional Director of Health Services. Such expenditures would include, extension to buildings, purchase of equipment, vehicles and other long term projects.

The Regional Director of Health Service acts as an important link between the Headquarters and the numerous health institutions in the region. Thus, at the unit hospital in the region, the Regional Medical Office and the respective Regional Directors are seen as supervisors or authorities who vet the activities of the hospital. Moreover, they provide channels through which the unit hospitals communicate with the Headquarters in Accra for very urgent matters.

From the national Headquarters on the other hand, the Regional Medical Office is a starting point for the administration of health institutions in the regions. The Regional Director is supposed to act as a nerve centre between the unit hospitals and the Headquarters. In this regard policy directives from the national Headquarters to the units are also routed through the region. It can therefore, be rightly said that the Regional Director of Health Services acts as a Coordinator on behalf of the unit hospitals for the Headquarters, and a supervisory role to assist the unit hospitals to implement policies.

2.6 ADMINISTRATION IN HOSPITALS

At the unit hospital level, there are the Interim Management Committees (IMC) which act as the Board of Directors of the hospital. The basis for the formation of the IMC's is derived from a circular in 1981 which stipulated their formation. Unfortunately, no decree or law details their function, but just their formation.

However, a close study reveals that most of the Interim Management Committee's act as advisory bodies to the hospital administration. The membership of the IMC generally includes, the hospital's Committee for the Defence of the Revolution (CDR's) Representatives of the Nurses Union, some community leaders with interest in the hospital, a few technical personnel and the tripartite committee of the hospital, comprising the Medical Officer, Administrator and the Principal Nursing Officer.

The I.M.C. therefore becomes the Management Board of the hospital and thus forms an important link between the hospital's administration and Regional Medical Office of Health.

The Chairman of the IMC in business circles, is akin to the Chairman of the Board of Directors. In most cases, he is a signatory to the hospitals bank accounts and the decisions taken by the committee is binding on the hospital.

The IMC, besides being an advisory body gives professional guidance for the conduct of the hospital and plays an important role in portraying the good will of the hospital to the community.

2.7 TRIPARTITE COMMITTEE

Regarding the day-to-day administration of the hospital, the Tripartite Committee made up of the Medical Officer in charge,

Hospital Administrator, and the Principal Nursing Officer are in control. However, the Medical Officer in charge being the appointed head of the institution presides over the committee and thus is accountable to the IMC on behalf of the tripartite committee.

The Medical Officer is supposed to be the head of the medical division of the hospital, while the Hospital Administrator is the head of the lay administration, with the Principal Nursing Officer, being in charge of the nursing department.
All these three important positions in the hospital are well represented at the Regional Medical Office, and correspondence from any of them must be copied to their respective heads at the Regional level.

The administration of hospitals in Ghana can be said to be cumbersome, without any specific delineation for smooth administration. What makes administration less straight forward is the fact that there are no specific guidelines from the Ministry of Health, except occasional circulars which give vague directives to the institutions to follow.

As it occurs in most government establishments in the civil service of Ghana, administration of hospitals permit very little initiative on the part of the administrators. Most of the time, the

tripartite committee has to approach the Regional Medical Office for permission to do the most trivial things. Furthermore, this system makes it difficult for change to occur and permits an outsider to think that the real authority to administer a hospital resides in someone outside the hospital management.

Considering outside influence on the management of hospitals, one can easily see more external influence on how a hospital should be run in Accra which is closer to the headquarters, and particularly at the Ridge Hospital which is both near the Regional Medical Office and the Headquarters.

It is quite common for letters to be written from the Headquarters and copied to the Regional Office requesting the transfer of a particular Senior staff to another establishment, or even the removal of some equipment for reallocation. In real terms, when such directives or issues appear, the hospital management cannot challenge or refuse it, but to comply.

2.8 FUNDING

Generally the government hospitals obtain their finances from three principal sources.

The first is from the quarterly votes that are granted the institutions through their respective regional offices. These grants are better known as Financial Encumbrances or simply F.E's.

The F.E's come from the Ministry of Finance and Economic Planning through the Accountant Generals Department, and their face values do not take into consideration the special needs of the hospitals as they have budgeted. This notwithstanding, the F.E.'s constitute very important sources of funding for the hospitals.

There are specific accounting headings for which moneys under the F.E.'s can be disbursed. The general headings include,

(i) Capital Expenditures

(ii) Repairs and Maintenance

(iii) Vehicles, etc.

For funds under one item to be utilised for something else, permission is usually needed to smoothly effect the change.

Grants or votes to the hospital designated as F.E.'s have a special account in the bank and are separated from all other funds.

2.9 HOSPITAL FEES

The second source of funding for running hospitals are internally generated from the hospitals own services to the public. These funds may be referred to as hospital fees account, or IMC accounts in some places.

The drug fees are specifically derived from the sale of drugs which are entered into a separate drug account. This drug account is supposed to be a revolving or rolling cash account to support the cash-and-carry system of drug administration.

Moneys that come under the drug account are in no way permitted to be used for any other purpose other than for the purchase of drugs for the hospital.

It is the Hospital Fees account that may somehow be 'freely' used for running the hospital. It is from this account that the hospital Interim Management Committee, together with the hospital administration mobilise funds to generate into some viable ventures like fixed deposit account, community Drug Store, Community Canteen, to mention a few.

Though it is stated in theory that the hospital can use the Hospital Fees account for its day-to-day running, it is practically not easy as the procedures to effect their disbursement are sometimes too cumbersome to be desired.

The third and also significant source of funding for hospitals is donations from individuals and organisations. These donations come in cash and kind and are usually valued as important sources in the hospital accounts.

2.10 SUPPLIES

Supplies to the hospital come in various forms and sometimes under different headings.

There are some supplies which specifically come from government funds or sources, and others which the hospital after the necessary authorization can purchase from the open market.

2.11 GOVERNMENT SUPPLIES

Supplies like drugs which are available in the government controlled Central Medical Stores are issued to the respective Regional Medical stores for further distribution.

If for some reasons a unit hospital requests or requisition items which are not available at the Regional Medical Stores, it is provided with a Nil Certificate confirming its absence in the government store. The Nil certificate thus authorises the hospital to obtain approval from the Headquarters in Accra, or the Regional Director to be able to buy those items from the open market.

At the Regional Medical Stores, the items are sold out to the unit hospitals at no mark up. This situation thus jeopardies the Regional Medical Store, should it encounter breakages or losses through spillage or evaporation, as is the problem with some supplies like ether and spirits.

Due to these circumstances, most Regional Stores run at a loss and are not able to serve their hospitals very well. It has however been investigated that some Regions, contrary to regulations add a small mark-up to cover their loses, cost of transportation and handling charges.

Thus, all that the Regional Medical Stores do is to centralise available government supplies in the region to prevent each unit hospital making individual requests and purchases at the Central Medical Stores in Tema.

It must also be mentioned that the Regional Health Office also finds it almost impossible to buy necessary supplies from the Open market when its stores are running out. In this respect, it could sit on a gold mine, without the mandate of utilizing its resources the way it pleases. One officer at the regional office who was interviewed actually bemoans this pathetic situation and sums up thus, "even though we are talking about decentralisation, we are rather over centralising in the Ministry of Health".

2.12 FOOD SUPPLIES

Food supplies to the hospital is another very important aspect of resources needed for the care of patients. Prior to October, 1991, most government hospitals were receiving monthly subvention to purchase food items, which in most cases were considered inadequate, and forced most of the hospitals into debt. The

inability of the hospitals to feed their patients with their subventions prompted the Ministry of Health to adopt a new system which it considers more appropriate.

The new system that is operating now is the Tender Board System. Under this arrangement, the Regional Medical Administration arranges with private food contractors who supply the required food items on tender basis. The supply of raw foods are distributed to the individual hospitals who after verifying their orders advise the Regional Offices about their suitability in terms of quantity and quality for payment. In this respect, the hospitals only receive and do not actually run around looking for food supplies on the market overt.

Notwithstanding what has just been said, the hospitals are permitted to buy a few petty items which cannot be stocked, or for which the hospital may run out. Items like salt and some few perishable items can be procured from the market with the imprest account.

Investigations reveal that most of the hospitals prefer the Tender Board System of food supplies as the onus of buying and paying for food items is shifted away from the individual hospitals to the Regional Medical Office, and furthermore, quite adequate quantities are always delivered.

2.13 SUPPLY OF DRUGS

It is well documented that any effective health service rests on some important supporting components or resource. These are Manpower, Drugs and Infrastructure. But when considering malnutritional care, among children, food or nutrients as a therapeutic agent and drugs become most important.

For most health institutions on the other hand, the attraction of clients depends on the availability of drugs.

2.14 THE NATIONAL DRUG POLICY

As a way of streamlining drug services in the country, the Ministry of Health has adopted certain policies regarding the importation, distribution and usage of drugs. Prominent among these policies are the adoption of an Essential Drug List and the cash-and-carry system. All these policies are to ensure the availability of safe, effective, good quality drugs to hospitals and the people at affordable prices.

It is maintained in the draft Cash-and-Carry document[2] that the drug procurement for the country depends on annual budgetary allocations. In this document, it is stated that about 40 percent of the National Health Budget is spent on drugs of which 80 percent of the cost is borne with foreign currency.

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2 **Cash and Carry System. MOH. Greater Accra Region. Unpublished, 1990 p. 2**

Procurement of drugs in the country at the national level is done through local purchasing or by international competitive bidding. The other source of drug supply is through donations from local and overseas organisations.

2.15 DRUGS

Drugs are the principal supplies which are used in most hospitals for therapeutic patient care. It has however become a very contentious issue in the administration of health services in Ghana. Most often drugs are in short supply either in the hospitals, market or both. During such periods, grave consequences occur, either some patients lose their lives or have their discomforts prolonged and discharges from hospitals delayed.

In view of the very important part played by drugs in the provision of health services, several efforts have been made to streamline its supplies, distribution and usage, particularly in government hospitals.

At the national level, there is a Pharmacy Board which in collaboration with the Director of Medical Services arrange for the supply of drugs to the country. At times, some raw materials are procured instead for the local pharmaceutical companies to process into finished products.

The drugs which the government supplies are either wholly imported,

manufactured by designated pharmaceutical companies, or are received as donations from abroad.

All government procured drugs are warehoused in a centralized Medical Store at Tema, which acts as the main collection and supply point.

From the Central Medical Stores in Tema, all the regions make their requisitions having taken the peculiar needs of their respective districts, village health centres, health posts and hospitals into consideration.

Every region is supposed to have a regional pharmacist who in collaboration with an authorised committee requisition drugs for the whole region. Thus the unit hospitals, health centres and health posts present the requisitions to the Regional Pharmacy for supplies.

The problem therefore begins here when for some unforeseen reasons, the regional pharmacy is unable to supply certain drugs.
The regional health administration is however authorised in a limited way to place orders from recognised pharmaceutical companies of which GIHOC Pharmaceuticals, and LETAP Pharmaceuticals are examples.

For the unit hospitals, there has been a circular which authorises

them to seek clearance and approval from the Secretary for Health before purchasing on the open market. This procedure besides being bureaucratic appears unnecessary and suicidal to restrain hospitals from freely purchasing their needed drugs, where the government supplies dwindle.

There is little wonder then that most of the government hospitals do not have even the basic drugs and most often patients attend hospitals only to be given prescriptions to buy them from the open market.

To overcome this hydra-headed problem with managing drug supplies in the hospitals to ensure the smooth delivery of health services, the cash-and-carry system was evolved, yet its effect on ensuring adequate all-year round supply of drugs in hospitals has not been achieved.

2.16 MANAGEMENT OF THE PML

The Princess Marie Louise Hospital (PML) is administered like any other government hospital in Ghana. The day-to-day running is the responsibility of the Medical Officer in charge, who is assisted by a Principal Nursing Officer (Matron). Unfortunately, this geographically small but very busy hospital has no Hospital Secretary to take charge over the lay administrative work of the

hospital. Thus, the Medical as well as the administrative tasks of the hospital are painfully and burdensomely shouldered by the Medical Officer in charge.

The hospital has a Management Board which functions as the Board of Directors to administer the hospital through offering broad policy guidelines, advice for professional conduct and general support from both professional and lay persons.

As with all other hospitals, the Chairman of the Management Committee is a signatory to the hospital's bank accounts and thus provides an important service of business and financial guidance. While other hospital's would prefer to designate their Management Boards as Interim, the PML does not use the term "interim", their reason is that, the Board has been functioning for so long, and offers such valuable service that it has passed the stage of being interim.

2.17 ADMINISTRATION

The Medical Officers of the hospital as well as the Senior Nurses are accountable to the Regional Director of Health Services and the Regional Principal Nursing Officer respectively of Greater Accra.

The personnel of the hospital, ranging from medical personnel

through nurses to other lay administrative staff are all under the control and supervision of the Greater Accra Regional Health Administration.

The PML obtains its personnel from the general pool of health services staff who are available to the Regional Health Administration. The required staff are usually applied for through the Regional Director, who through the Regional Principal Nursing Officer or Regional Hospital Secretary post personnel to the hospital depending on their availability. It is through this same process that staff are either transferred or dismissed.

Like other government hospitals, the ultimate authority to discipline staff rests with the management but the power to dismiss resides with the Regional Administration and not with the hospital authorities.

2.18 SUPPLIES

Almost all the essential supplies that the hospital depends upon for its smooth administration are provided by the Regional Medical Stores. One can then say that the state of supplies to the PML is centralised. Regarding food items which constitute one of the most essential supplies, the Regional Administration has centralised the procurement and supply under the Tender Board. This tender system enjoins food contractors who have contracted with the hospital to supply the needed food items. The bills are then submitted to the Regional Medical Office for payment after vetting.

Through personal interview with the Catering Officer, it was intimated that the tender system of food supply is very helpful to the hospital as it absolves them from unnecessary rigorous vetting and auditing. Furthermore, the hospital does not incur any direct costs in purchasing the items.

It was also discovered through interview that the Catholic Relief Services, a non-governmental organisation provides the bulk of the required skimmed-milk needed particularly for feeding kwashiorkor patients. The free supply is about three bags per month. It was revealed that a member of the Management Board, Rev. Father Campbell, a Catholic priest, who has adopted one of the Wards, does the arrangement for the supplies of skimmed milk through the Catholic Relief Services.

With respect to drugs, requisitions are made to be Regional Medical Stores for supplies. However, when drugs run out at the Regional Medical Stores, the Medical Officer and the Chairman of the Management Board sanction purchases from approved pharmaceutical companies. Normally, this procedure has to be channelled through the Regional Pharmacist and Director, but for brevity, the hospital usually goes ahead without passing through the long system. Upon investigation, I was made to understand that the Outpatient clinic of the hospital is very busy and that means the hospital cannot afford to do away with some essential drugs like chloroquine, paracetamol and multivite syrups.

2.19 FINANCING

The organisational arrangement of the financial management of the hospitals in Ghana leaves much to be desired. While the hospital works to generate its funds from selling services to the public, such funds are not under the direct control of the hospitals, but are regarded as government revenue, and as such are under the control of the Controller and Accountant General's Department which belongs to the Ministry of Finance and Economic Planning. It is maintained that due to the noticeable lack of control by the hospitals of their own monies, financial discipline is weak. In this regard while a hospital may need to disburse some money to purchase certain important supplies which are lacking promptly, it may have to utilise a long and time wasting procedure to gain approval before such expenditures can be met, and this will even depend on how much money is involved. The worst aspect is that at times some lapse duration is even needed to ensure that the institution can ask for money again without feeling that it is bothering the authorities. This was the situation prevailing at the time of conducting the study, however, the trend of affairs are gradually being reviewed.

The dependence of hospitals on the government treasury for subvention is a bit difficult for the institutions because such moneys are irregular, and worse still they are not allocated to the hospitals directly. This situation makes planning ahead difficult, because the administration cannot guarantee when the quarterly

allocation will be received, and how much of the amount requested based on their budget will be approved. In most cases, hospitals receive far less subvention than they ask for. Unfortunately, funds generated from the user charges are not enough because legislation prevents them from charging realistic fees. Besides these, donations which constitutes important sources of financing and running of hospitals are inadequate and unreliable. To this end, most of the hospital operate under very tight and stressful financial constraints, having to purchase most needed equipment and supplies under credit before paying when funds are available. Some government hospitals therefore operate under the mercy of the forces of supply and demand on the market, and at times on the sympathy of suppliers and creditors.

CHAPTER THREE

3.0 LITERATURE REVIEW

Malnutrition has become an important public health problem which continues to threaten normal growth and development of children in many poor homes.

Malnutrition normally tends to occur primarily in poor families living under adverse socioeconomic and environmental conditions typically associated with poverty, poor housing and sanitation. Exposure to infectious and parasitic diseases, inadequate health care, large family size, limited educational opportunities, poor feeding and poor child care practices, are some of the causes of malnutrition.

Malnutrition may lead to increased early child mortality and morbidity, substantial impairment of physical growth and brain development, particularly if the nutritional deficits are early, severe and long lasting without treatment.

Most of the problems of malnutrition result from protein calorie malnutrition, or protein energy malnutrition. This includes conditions of nutritional marasmus, or starvation beginning from the earliest months of life. Children who suffer from marasmus have an impaired motor development. Another common disease resulting from long lasting protein deficiency is Kwashiorkor.

3.1 PROTEIN

Protein is a word derived from a Greek word "proteios" meaning of prime importance. It has been hailed as holding the central position in the architecture and functioning of all living matter. Proteins make up some of the components of bones, skin, hair and muscles. As a catalyst protein enzymes speed up the reaction of metabolism; as haemoglobin and myoglobin, proteins facilitate oxygen transport in the blood, and as hormones, proteins act as regulators of metabolism.[3] Nutritional assessment permit baseline nutritional statistics and need support to be established. Such assessments permit the state of balance between tissue nutrient needs and actual nutrient supply to be obtained.[4] Assessments of nutritional status allows the classification of children into three categories. These are:

1. Those who are already malnourished and need immediate nutritional rehabilitation.
2. Those with little nutrient store and are at risk of becoming malnourished and need immediate nutritional support.
3. Those who are well nourished and need no support of special nutritional therapy.[5]

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[3] Luke, B., Principles of Nutrition and Diet Therapy. Little Brown & Co.Boston 1984 p.19.

[4] Hooley,R.A., Clinical Nutritional Assessment: A Perspective. Journal of American Diet Association. 1980 Vol 77.p 682.

[5] Gary,G.E.,and Gary G.K. Anthropometric Measurement and Their Interpretation: Principles, Practices and Problems. Journal of American Diet Association. 1980, 77:534.

3.2 ASSESSMENT OF MALNUTRITION

It is sometimes quite easy to observe and determine malnourished children on physical sight. Other conditions are manifested which needs the assistance of clinical or biological assessments. Jellife mentions that physical signs and symptoms can be valuable indicators of nutrient deficiencies.[6] These signs include :

1. Signs that are most often associated with nutritional deficiencies.
2. Signs that may be related to malnutrition but are often found where other health and environmental problems exist (dehydration, weight loss).
3. Physician or professionally trained nutritionist diagnosing the problem of malnutrition.

3.3 ANTHROPOMETRY

This procedure involves the scientific measurement of the human body. It is said to provide a quick, simple and an inexpensive method of assessing a persons nutritional status, particularly , protein and calorie reserves. The usual measurements are height, weight, head and chest circumference and skinfold thickness.

3.4 LABORATORY ASSESSMENT

Laboratory assessment of malnutrition provides a more objective measurement of nutritional status. Laboratory measurements utilize

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[6] Jellife,D.B. The Assessment of Nutritional Status of The Community (WHO Monograph No.53) Geneva. WHO,1966.

biochemical tests to measure levels of nutrients or to evaluate biochemical functions of the body that depend on a certain level of essential nutrients.

Two types of tests are generally used to determine malnutrition in the laboratory. These are the :

1. Circulatory level of the nutrients in the blood or urine, and
2. The functional test which measures the effect of the nutrient deficiency on the enzyme system utilizing it.

Christakis mentions the following as the assessment of nutritional status:[7]

1. Serum protein, particularly albumin level
2. Blood forming nutrients; iron folic acid, vitamins B6 and B12
3. Soluble fat, Vitamins A,D,E, and K
4. Urinary levels of water, soluble vitamins and protein , and
5. Minerals, iron, iodine, and others.

3.5 PRIMARY MALNUTRITIONAL RELATED DISEASES

Conditions of primary malnutrition are caused when there is inadequate dietary intake especially during early weaning. Malnutrition may also be caused by malabsorption from the gastrointestinal tract or the occurrence of interference with the utilisation of nutrient by drugs, or metabolic diseases.

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[7] Christakis, G., Nutritional Assessment in Health Progress. American Journal of Public Health. 1973, 63:28

Protein calorie malnutrition among children has been found to be the most serious health and nutritional problem in the world, particularly in developing countries. The manifestation of this problem in children is usually clinically diagnosed as Marasmus and Kwashiorkor.[8]

3.5.1 MARASMUS

Marasmus is derived from a Greek word "marasmos", meaning wasting or withering. It is a type of malnutrition caused primarily by a deficiency of protein and calories. Marasmus in children is usually equated to starvation in adults. Marasmus usually affects children under one year.

3.5.2 KWASHIORKOR

Kwashiorkor on the other hand, is a disease caused by protein deficiency, usually, when weaned children are predominantly fed on carbohydrates and less protein. Kwashiorkor was first introduced into the medical dictionary by Dr. Cicely Williams in 1933. It usually affects children under five years. There is also a syndrome between the two diseases (marasmus and kwashiorkor) referred to as marasmic kwashiorkor. In this syndrome, clinicians have determined marked wasting of the skeletal muscles and atrophy of the heart and intestinal mucosa.

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[8] Luke, B. op cit. p. 578.

3.6 MARASMUS AETIOLOGY

The general causes of malnutrition, be it kwashiorkor or marasmus stems from poverty, ignorance or both. Besides these two factors, marasmus may also occur through improper child care, neglect or the occurrence of disasters such as wars, earthquakes and famine, which affects communities, particularly those in the low socio-economic group. Overwhelming infectious diseases such as diarrhoea and measles can also trigger it.

In developing countries, early childbirth resulting in the displacement of another sibling from the breast milk has been cited as the leading cause of marasmus. Lack of lactation either due to the immediate loss of the mother, or failure of lactation could be a remote cause. Early weaning in some cultures without proper supplement of nutritious food or ignorance about proper child care do worsen the case of marasmus. The purity of infant formula which is mostly used as a supplement depends on the purity of its preparation. The sterile procedures involved in the preparation affect the health of the children if it is not adequate enough to safeguard their health.

3.7 CLINICAL FINDINGS

Luke describes the clinical manifestation of marasmus as hampering of growth. Muscles atrophy or waste, with thin limbs and a protruding stomach. Weight for age is also low, and the children

affected appear emaciated, dry and dehydrated with skin folds.[9],[10] Other common complications are eye lesions due to hypovitaminosis A.

3.8 KWASHIORKOR

Kwashiorkor is a common word in Ghana, but a dreadful disease which mostly affects children between the ages of one and three years. The disease is usually associated with poverty, and is mostly seen during the weaning period when the child is put off the breast milk, but does not have enough diet which is protein rich as a substitute or supplement. Kwashiorkor may be hastened in an environment where the rapid growth of the child is not complemented by adequate protein nutrition, or where many mouths in the family does not permit adequate protein for the newly weaned child. Other factors could be attributed to the seasonal shortages of food, poverty and ignorance which may be worsened by infections and illnesses.

3.9 CLINICAL FINDINGS

The growth rate of kwashiorkor children is always stunted with muscle wasting being marked by oedema. Affected children usually have a big stomach. The oedema which manifests itself is seen all over the body but it is particularly prominent in the lower limbs.

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[9] Luke, B., op cit. p. 580

[10] Goodhart, R.S., Shils, M.E., Modern Nutrition in Health and Disease. Lea & Febiger, Philadelphia. 1976.p. 612.

Other visible signs are ulcers, deep cracks and a "flaky" skin, this is as a result of vitamin deficiency.

The hair is usually affected as it loses its pigmentation by becoming grey, red or blond in colour, and generally sparse and thin in outlook. Anaemia is commonly found in kwashiorkor cases and diarrhoea may occasionally set in to worsen the condition.

It is clinically diagnosed that the liver in Kwashiorkor victims is always enlarged and infiltrated with fat. Sores may be found in the mouth of affected children who show marked signs of apathy, lack of playing interest while becoming easily irritated and dull.

Pulmonary oedema with bronchopneumonia, septicemia, gastroenteritis and water electrolyte imbalances are the most commonly found causes of death.

3.10 MARASMIC KWASHIORKOR

The majority of cases of severe malnutrition in children fall between marasmus and kwashiorkor. This is a problem of pure caloric and pure protein deficiency. In this problem, a moderate to severe degree of calorie deficiency and vice versa , a moderate to severe degree of calorie deficit may be superimposed on a severe degree of protein deficiency.

3.11 GLOBAL NUTRITIONAL STATUS

Globally, stunting and wasting are used to assess the extent of nutritional status in infants and children.

3.12 WASTING

Wasting indicates a deficit in tissue and fat mass of a child who is malnourished compared with the amount expected in a child of the same age and height who is normal. This may be either due to a failure to gain weight or from actual weight loss. The condition may be precipitated by infection or some other household crisis, and usually occurs in situations where the family food supply is limited and the food intake of children is low. At times, there are seasonal episodes of wasting related to the variation in food supply or in disease prevalence. Wasting can develop very rapidly, and under favourable conditions be restored rapidly to its normal required measure.[11]

There are not only age related differences in the prevalence of wasting and stunting, there is also a difference in geographical distribution. There are some group of children with a relatively high prevalence of wasting coupled with a relatively low prevalence of stunting; the opposite can be found in other areas.[12],[13]

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[11] Answorth,A., Growth Rates In Children Recovering from Protein Calorie Malnutrition. British Journal of Nutrition. 1969, 23 pp.835-845 [11]

[12] Keller,W., Fillmore,C.M., Prevalence of Protein Energy Malnutrition. Lancet 1981 1: 1430.

In assessing nutritional status, wasting and stunting are frequently combined but on biological, epidemiological and statistical grounds, wasting and stunting represent different processes of malnutrition.

The world food situation measured in terms of the child mortality rates show improvements over the last twenty years except Sub-Saharan Africa which is considered to be suffering declining food availability and increased malnutrition. Total numbers of child deaths are still rising in Africa, in contrast to most regions.

Globally, malnutrition is one of the pressing human sufferings. Even though hunger cannot be measured directly, its effects on the severity of malnutrition on people can only be measured after a prolonged period. Food production and availability, population growth, economic growth and development and health interact to determine the world nutritional situation.

Figure 1 shows the distribution of malnutrition leading to the prevalence of underweight children. The distribution indicates that Africa recorded increased prevalence, with South America recording no change from 1980 to 1984.

Figure 2 shows the distribution of low birth weight by country, in

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[13] Anderson M.A., Comparison of Anthropometric Measures of Pre-School Children in Five Developing Countries. American Journal of Clinical Nutrition. 1979, 2339-2345.

1982. This indicates the stark problems that most countries round the globe are facing as far as malnutrition is concerned. Most countries in Africa happen to fall within the range of 10-19.9 per cent of low birth weight. Low birth weight has been determined to show a strong association with impaired child performance, health and survival. Actually the distribution of low birth weight shows that survival rate among children increased throughout most parts of the developing world in the eighties. This may be attributed to the proliferation of the usage of vaccines and oral rehydration therapy.

In Africa, estimates of child nutritional status demonstrates that improvements ceased since the 1970's with economic stagnation, severe drought and turbulent political situations. A United Nation report states that Africa is declining in Vitamin A and iron and further asserts that about 50 percent of women in child-bearing age in developing countries are anaemic from iron deficiency.[14]

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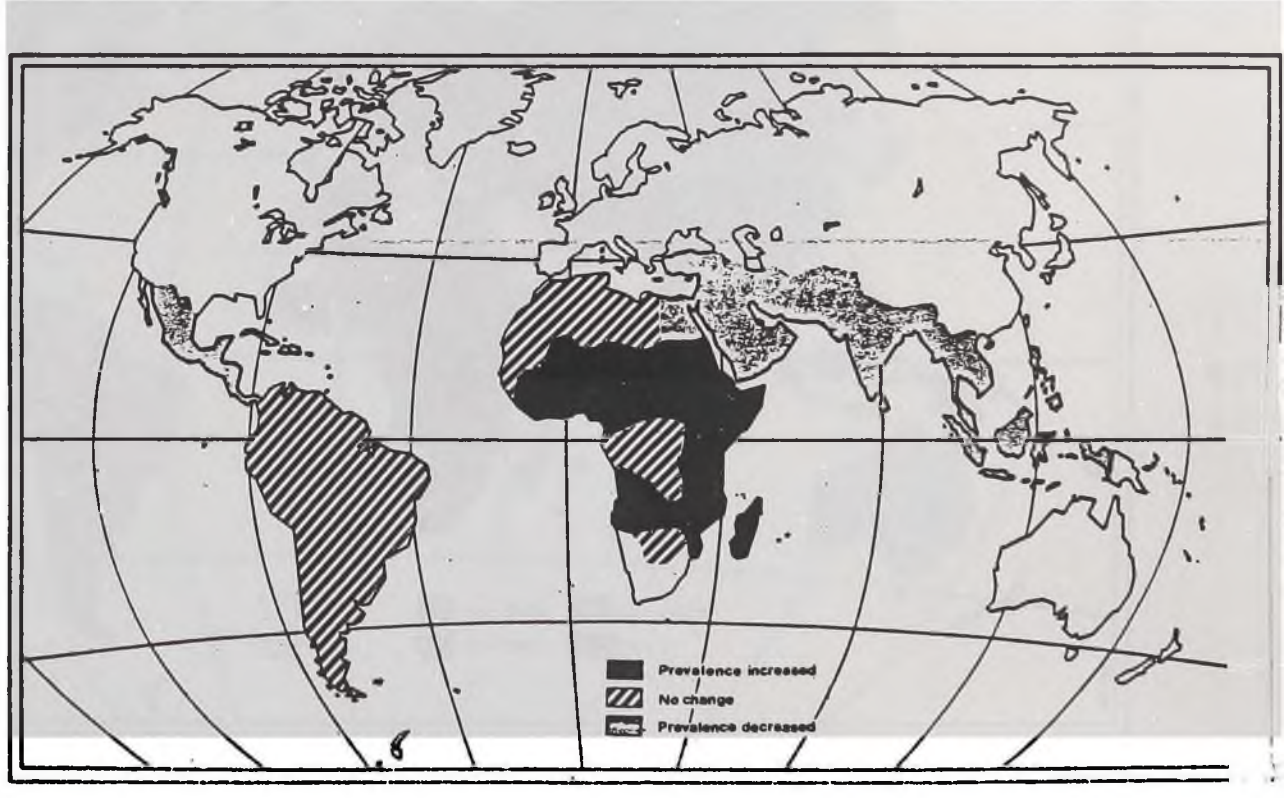
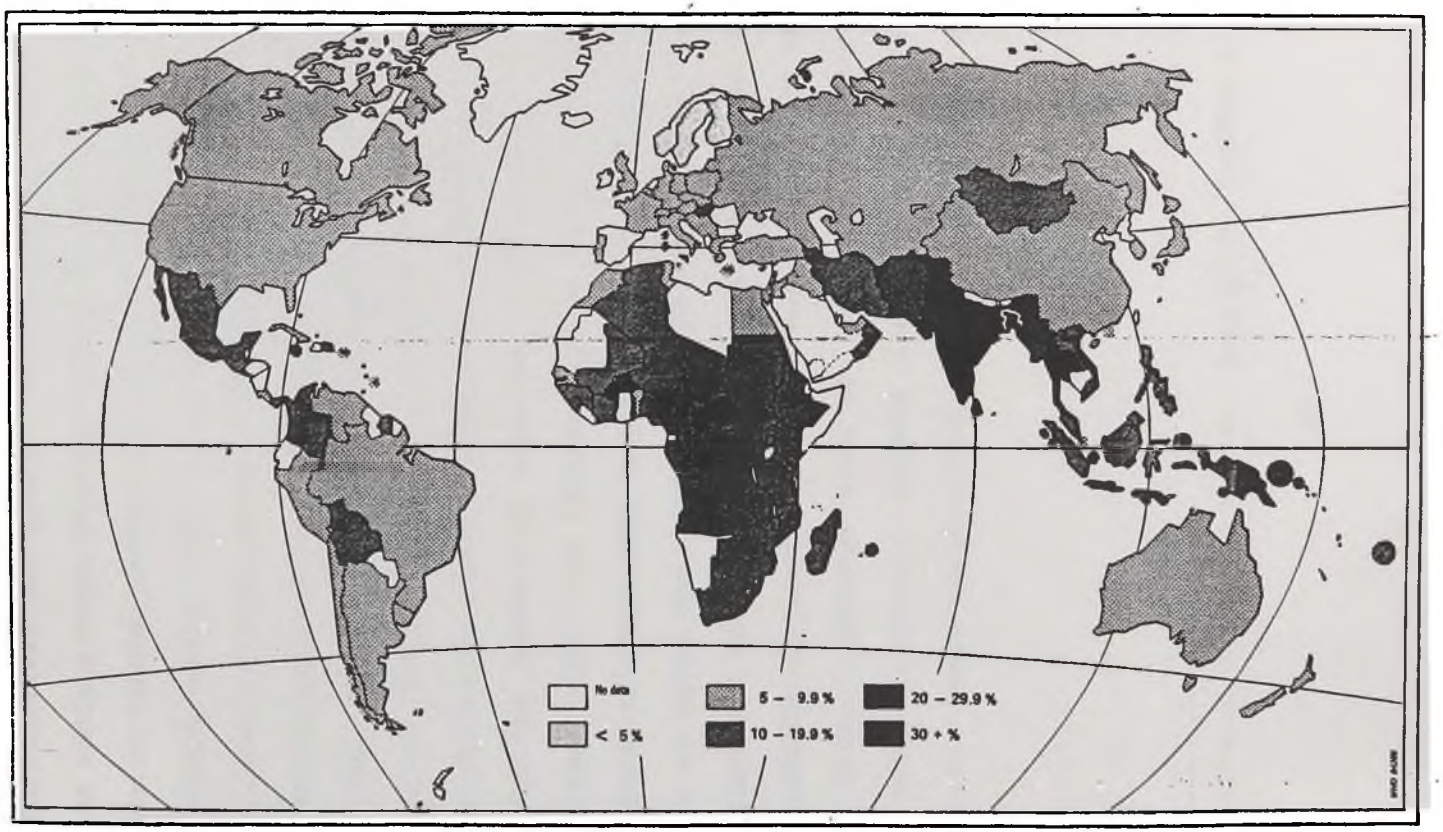
[14] UN. ACC/SCN. First Report on World Nutrition Status Nov. 1984,pp. 1-4.

FIGURE 1: Changes in Prevalence of Underweight Children by Groups Countries from 1980 to 1984.



UN FIRST REPORT ON THE WORLD NUTRITION SITUATION.

FIGURE 2: Incidence of Low Birthweight by Country, 1982



(Source: WHO, 1984)

3.13 BREAST-FEEDING

Infants throughout the world depend on breast milk from their mothers for survival and growth in their early months of life. However, as society keeps developing many changes are occurring in the methods of feeding infants and the predominance of breast milk for sustaining early life is gradually giving way to more artificial feeding supplements. The reasons attributed to this changing developments are varied, depending on societies customs and practices, and the ability of the mothers to provide enough breast milk to feed their babies. Beaton and McHenry, attribute the change partly to improved knowledge of methods of artificial feeding and the decreasing emphasis of the advantages of the natural breast milk.[15] The introduction of food as supplement for breast feeding is increasing very fast. It was even customary some years back to delay the introduction of cereals and mixed foods till the time that the first milk teeth appeared. These days, such food supplements are given to infants during the early months and weeks of life. Although this has been satisfactory in some infants, other individual infants suffer adverse effects as a result of the early substitution of food supplements and early weaning.

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[15] Beaton, G.H., McHenry, E.W., Nutrition. Academy Press, N.Y. 1966,p.1.

The objective of good infant feeding is to provide a balanced diet and nutrition for satisfactory growth and upkeep of good health.

It is estimated that infants normally double their birth weight during the first 5-6 months after birth, and triple their birth weight from 11-12 months. It is during this period of rapid growth that infants demand optimum intake of food in good quantity and quality. During the early life when breast feeding is constant, infants can gain an ounce of weight a day. It is also during this time that when kids are weaned without adequate food supplements in the right quality and quantity that deficiencies become most common, which hamper the growth and psychological development of infants and children.

Retardation of growth can be hampered by insufficient food, resulting from deprivation, illness, infections and lack of proper absorption of food nutrients in the body. Maternal deprivation has been identified as one of the most important causes of delayed growth and development of infants and young children.[16] Such deprivation can lead to altered absorption of food, loss of appetite, and actual reduced intake of food and fluids.

Usually the cost of nursing an infant depends on the amount spent on the mothers diet. In developing countries, because the majority of families are on low incomes, which dictates the necessity for

[16] Beaton, G.H., McHenry, E.W. ibid. 1966, p.4.

economy in feeding infants and children, breast milk becomes the easiest , safest, and probably the cheapest feeding method. Gonzales has determined that urbanisation is one of the factors responsible for a decline in breast feeding and earlier weaning.[17] Usually, women in urbanised areas tend to follow the practices of the upper and middle class families who can afford to supplement nutritious infant formula. Thus due to peer pressure, and desire to live affluently, poor urbanised mothers wean their children early, but are unable to supplement the babies feeding due to lack of money to buy nutritious infant formula. This then results in malnutrition in their children.[18]

3.14 BREAST-FEEDING PRACTICES IN GHANA

The practice of breast-feeding in Ghana provides a major contribution to the survival of infants and children by providing the best possible nourishment during the first three to four months of life.[19] Breast-feeding naturally protects infants and children from some common infectious diseases like measles diarrhoea, and others.

Breast-feeding is quite commonly practiced in Ghana by all communities, but the duration varies from one district to another

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[17] Salien de Gonzales, N.L., Journal of Paediatrics 1963, Vol 62 No. 577.

[18] Beaton,G.H., McHenry,E.W., op cit. p.6.

[19] Children and Women of Ghana, a Situation Analysis. Republic of Ghana and UNICEF, 1990,p.52.

district. Those cultures with more illiterates and less numbers of working mothers do breast-feed their children for longer periods than where the presence of women in labour or economy is greater, such as urban areas. Breast-feeding is generally concentrated between 6 and 18 months, though in few cases it could be more.

Table 1 shows the duration of breast-feeding in some selected districts in Ghana. The average number of months for breast-feeding is 18 months. A more critical analysis of the table however indicates that the duration in the country reduces from the coastal areas through the forest zones to the Northern savanna zones. This pattern underscores the wide variations in cultural practices of the inhabitants.

Table 1

Percentage Distribution of Breast-feeding Duration by Districts

DISTRICT	6months	6-11 months	12-18 months	18months	2years	No. response
Coastal						
Dangbe	6.6	21.9	27.4	40.7	1.1	2.3
Anlo	6.0	16.8	32.9	42.8	1.5	-
Forest						
Wassa-Fiase						
Mpohor	2.1	18.6	36.1	14.1	25.5	3.5
Assin Fosu	1.9	12.0	41.9	19.9	19.1	5.2
Asante Akim	1.0	4.2	33.3	46.5	12.5	2.5
Amansie West	4.4	8.4	31.4	29.9	21.6	4.3
Suhum-Kraboa						
Coaltar	5.5	16.0	43.0	27.0	7.5	1.0
Kwahu	3.3	15.9	18.9	33.1	26.3	2.5
Tachiman	2.2	4.5	24.8	54.0	10.2	4.3
Atebubu	5.7	17.9	53.4	16.4	5.4	1.2
Northern						
West Dagomba	0.5	3.1	27.2	50.5	27.2	1.5
Bole	1.0	5.2	23.1	40.8	26.3	3.6
Bawku	1.8	6.1	14.5	52.5	22.4	2.7
Lawra	4.9	3.9	13.2	61.6	11.2	5.2

Source: District Profile Survey, 1985 ✓

A substantial number of mothers in the Northern regions and parts of the forest zones breast-feed their babies for about 24 months. While this duration will definitely be out of place in the Dangme and Anlo Districts of the coastal belt, it is a common practice in the Dagomba, Bawku, Kwahu, Wassaw and Assin Fosu areas.

The coastal districts are known to top the list in Ghana for very short durations of breast-feeding. It is also quite common for Ghanaian mothers to introduce their children to bottle-feeding while they are still breast-feeding them. This practice is very common in the coastal areas where literacy is high and affluence is also predominant. It is even sometimes argued that some mothers particularly, the educated and income earners, substitute early bottle-feeding to enable them leave their children at home to be able to return to work after their maternity leave.[20]

3.15 WEANING

Between four to six months, breast-milk alone for infants become insufficient due to their growth demands, and thus require that additional nutrients be added. It is through this desire to supplement additional artificial foods for children that the desire to wean them begin. Some children between six months may be weaned when their mothers become pregnant again, this practice is quite widespread in Ghana as it is erroneously thought that it safeguards the health of the child and the developing foetus. On the other hand, some children are weaned early because the health of their

[20] Children and Women of Ghana ibid. p.54.

mothers fail; the breast-milk produced is not much or lose their mothers altogether.

It is at this period of the child's developmental process when it needs the supplements of food rich in protein that if it is denied, due to the inability of the family to support it that serious consequences begin to set in.

In order to correct the imbalances in children's nutrition during weaning or at the brink of weaning that attempts are now being made to improve the quality of weaning foods.

With the help of international donor agencies particularly UNICEF, mothers in communities which are particularly prone to infant malnutrition are being educated to use cereals and legumes such as maize, millet, beans and groundnuts to prepare nutrients and well balanced weaning foods. Such weaning foods are gradually becoming more acceptable and popular throughout the country. It is emphasised that the prevalence rate of malnutrition could be attributed to breast-milk inadequacy in younger infants and inadequate supplementation of weaning foods in older infants.[21]

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[21] Amar-Klemasu, M.A., Wheeler, E.F., Weaning Practices and their Outcomes: A Critical Look With Special Reference To Ghana. Jan. 1991 (1) Vol 4 Bulletin of Noguchi Memorial Institute For Medical Research.p.135.

3.16 MICRONUTRIENTS

Dietary deficiency of micronutrients which is also very vital in body building exists in many parts of the world.

Vitamin A, iodine and iron deficiencies are the most important in terms of their prevalence. Other important deficiencies are scurvy from vitamin C deficiency, rickets related to vitamin D, and anaemia related to vitamin B12 and folic acid.

3.17 VITAMIN A DEFICIENCY

When vitamin A deficiency is severe, it causes blindness which commonly starts in children and can affect health. Blindness and mortality associated with vitamin A deficiency are heavy burdens in developing countries. The major cause of this is due to inadequate dietary intake of vitamins to meet the requirements of these nutrients in the body, which can also be worsened by absorption.

The accepted average requirement of vitamin A for children is 250-575mcgRE/caput/per day and 750mcgRE/caput/per day for adults. In developing countries this range is always above the available intake, thus creating a dangerous gap.[22]

The rate of appearance of new cases of vitamin A deficiency (xerophthalmia), measured as eye damage per year among pre-school children is about 750,000 per year among pre-school children worldwide.

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[22] UN.Report on World Nutrition Situation ACC/SCN.1987.p.32.

Estimates show that about 60 per cent of children affected by vitamin A related eye damage die while 25 percent of the survivors remain totally blind. A substantial proportion of the survivors, about 50-60 percent remain partially blind.[23] The report continues that some 250,000 children go blind or partially blind each year. About 3 million children under 10 years of age are blinded from this cause. Vitamin A deficiency has been identified as the single largest cause of blindness of an estimated 40 million people worldwide.[24] Figure 3 shows the distribution of Xerophthalmia in the world. It shows its distribution in the tropics, particularly Africa and South
East Asia. In the developed world where the intake of adequate nutrients rich in vitamins is ensured, there happens to be no problem with this disease.

The United Nations has adopted a ten year programme to combat vitamin A deficiency with the active collaboration of its agencies namely, FAO, WHO, UNICEF and others. A number of bilateral agencies and donors are also supporting the development of such projects and programmes in different countries. If such programmes continue unhindered, it is hoped that vitamin A deficiency can be curbed and finally reduced to the point that it would no longer

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[23] International Vitamin A Consultation Group, The Symptoms and Signs of Vit.A and their relationship to Applied Nutrition July 1981.

[24] Kupfer,C. A Decade of Progress in the Prevention of Blindness. The Newsletter of the International Agency for the Prevention of Blindness. 1987 Mar., No. 9, Bethesda, Maryland.

constitute a public health problem. This will save the eye sight and lives of several million children.[25]

3.18 IRON DEFICIENCY

Iron deficiency is the most common cause of nutritional anaemia in children and women of reproductive age.[26] Anaemia could be understood as the lowering of haemoglobin concentrations in the blood below certain levels proposed by WHO.[27]

There are many causes of anaemia, it could result from malaria, intestinal parasites, and also deficiency in iron intake in the diet, as well as its absorption in the body. Other causes of anaemia could be through blood loss due to injuries or accident or bone marrow diseases.

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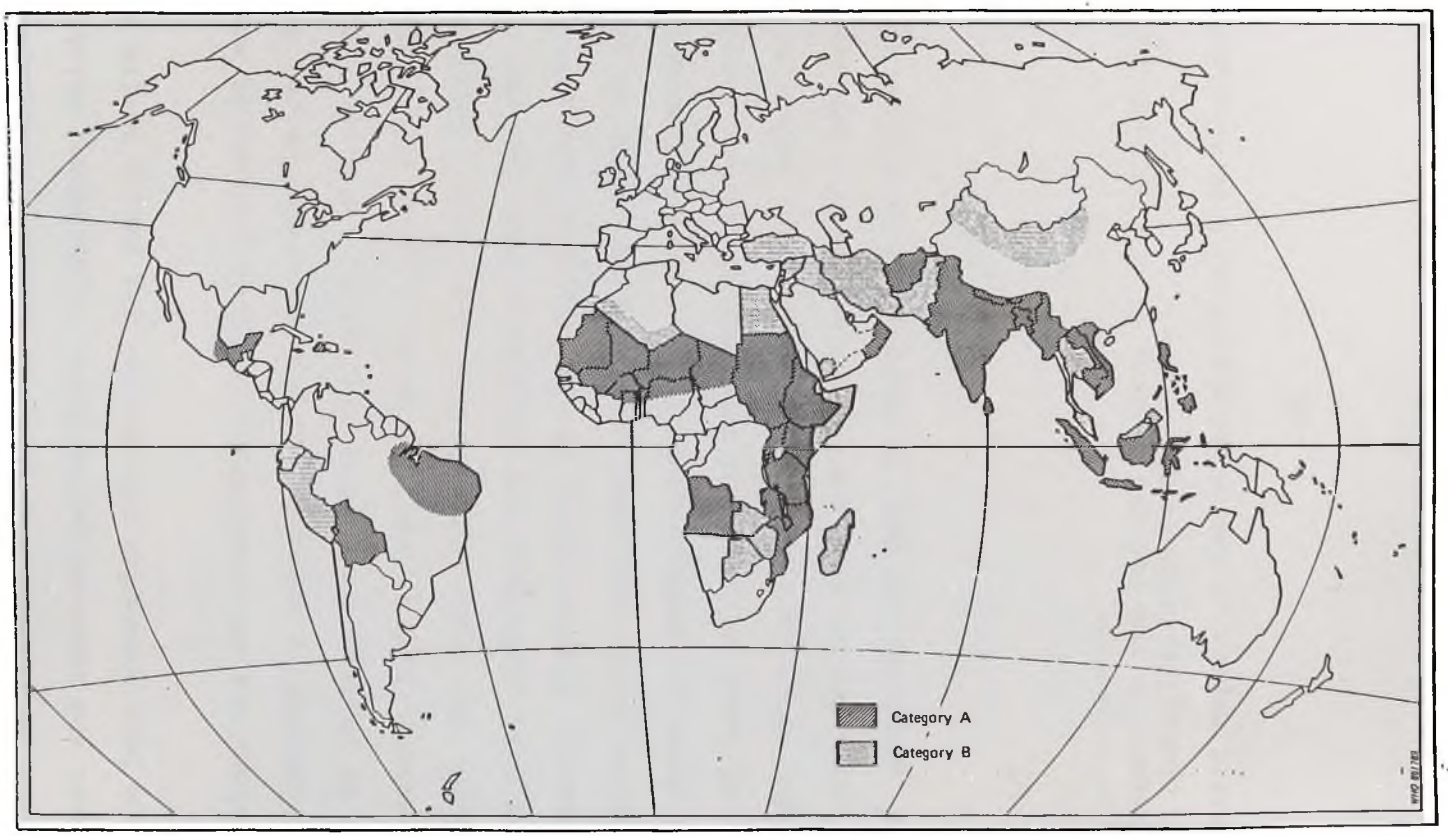
[25] Administrative Committee on Coordination, Sub-Committee on Nutrition. (ACC/SCN) The Prevention And Control of Vitamin A Deficiency an Xerophthalmia Progress Report by WHO (ACC/SCN) Mar. 1987 pp.2-7.

[26] De Maeyer, E.M., Adiels-Tegman, M. The Prevalence of Anaemia in the World. WHO Statistics Quarterly.Vol. 38, pp. 302-316. Geneva.

[27] WHO Nutritional Anaemia. WHO Technical Report Series No. 405. Geneva.

FIGURE 3: The Geographical Distribution of Xeropthalmia in 1986.



(Source: DeMaeyer, 1986) UN FIRST REPORT ON THE WORLD NUTRITION SITUATION.

Anaemia can affect a person's work performance and bodily resistance to infection. It is also known to exert adverse effects on the psychological function and cognitive development.[28] It is this effect of anaemia and iron deficiency on the psychological development and function particularly in children, which makes it one of the most extensive nutritional and public health problems.

Table 2 shows the WHO information on the prevalence of anaemia and its distribution by regions. It indicates that nearly 50 percent of women of reproductive age in developing countries are at least mildly anaemic, this in absolute terms is about 290 million women; with Africa and South Asia topping the list.[29] Table 2 further indicates that about half the children between the ages of 1 and 4 are virtually anaemic compared with just 12 per cent of their counterparts in the developed world. While nearly 60 per cent of pregnant women in developing countries suffer from anaemia only 14 per cent of women in developed countries may become anaemic during pregnancy. There is virtually no significant report of cases of anaemia among men in developed countries (only 3 per cent) while about 26 per cent of men in developing countries may become anaemic.

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[28] Report on the Twelfth Session of the ACC/SCN and Advisory Group on Nutrition. 1986 Tokyo,.FAO.

[29] First Report on the World Nutrition Situation ACC/SCN 1987 p.38.

TABLE 2

ESTIMATED PREVALENCE OF ANAEMIA BY GEOGRAPHIC REGION AND AGE/SEX CATEGORY, AROUND 1980 (POPULATION DATA IN MILLIONS)

REGION	CHILDREN				MEN		WOMEN			
	0-4 years		5-12 years		15-59 years		15-49 years			
							Pregnant		All	
	%	Number	%	Number	%	Number	%	Number	%	Number
Africa	56	48.0	49	47.3	20	23.4	63	11.3	44	46.8
Latin America	26	13.7	26	18.1	13	12.8	30	3.0	17	14.7
East Asia*	20	3.2	22	5.6	11	6.1	20	0.5	18	8.4
South Asia	56	118.7	50	139.2	32	123.6	65	27.1	58	191.0
World*	43	193.5	37	217.4	18	174.2	51	43.9	35	288.4
Developed regions	12	10.3	7	9.1	3	12.0	14	2.0	11	32.7
Developing regions	51	183.2	46	208.3	26	162.2	59	41.9	47	255.7

NOTES: * Excluding China. All calculations were made before rounding, figures may thus not add to totals.

Anaemia is defined as a haemoglobin concentration below WHO reference values for age, sex, pregnancy status.

Regions are drawn according to United Nations regions; more developed regions include Northern America, Japan, Europe, Australia, New Zealand, and the Union of Soviet Socialist Republics.

Prevalence rates are estimated from the various studies.

SOURCE: DeMaeyer & Adiels-Tegman, 1985.

3.19 NUTRITIONAL STATE IN AFRICA

Throughout the 1970's, population expanded more rapidly in Sub-Saharan Africa than food production. The decline in nutritional status was only offset by rising food imports and food aid, thus making it possible for the dietary energy supply (DES) to increase marginally between 1979 and 1981. The UN report on nutrition estimates that the proportion of the population undernourished in terms of access to food fell slightly from 24 to 23 per cent.[30] But in absolute terms, the number of people undernourished increased from 60 million in 1971 to nearly 80 million in the 1980's.[31] Out of this frightening picture, some 16 million children who were underweight were believed to be in Ethiopia and the Sahelian countries. As a result of this crisis period, malnutrition related infant death rates was high between 75-180 per 1000 live births in Africa, while child deaths between age 1-4 years was around 10-50/1000 children per year. The average infant mortality rate was estimated at 122 deaths per 1000 live births, and child mortality rate as 26 per 1000 live births per year. This is equivalent to about 2.3 million child deaths annually. Many of these unnecessary deaths were preventable and malnutrition contributed to a substantial proportion of such deaths.[32]

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[30] UN. ACC/SCN First Report on World Nutrition Status Nov.1987 p.8.

[31] UN. ACC/SCN ibid. p.10.

[32] UN. ACC/SCN. ibid. p.10.

Africa's nutrition situation worsened during the early 1980's, at the onset of a severe drought which reduced food production drastically across the continent, particularly across the Sahelian region. By 1984 the caput food production index had fallen by about 20 percent of 1970 figures. Thereabout this time, food intake or dietary energy supply fell from about 2150 kcals in 1979/80 to 2050 kcals in 1983/85.[33] When such crisis strike, it is the poor and marginally placed people with less access to food who suffer most.

Analyst estimate that during the food crisis of the early 1980's, the proportion of Africans undernourished was higher than at any time in the previous 15 years. This in absolute terms represent about 100 million affected people. However, after 1986, when the drought and disasters subsided, the situation has reverted to normal. The eighties again brought in is trail widespread clinical problems sparked off by malnutrition.

Figures 4A and 4B show the trend of food availability and the prevalence of underweight children in Sub-Saharan Africa in 1980. The figures show the stark problem of low food availability in most parts of Africa and the high prevalence of underweight children.

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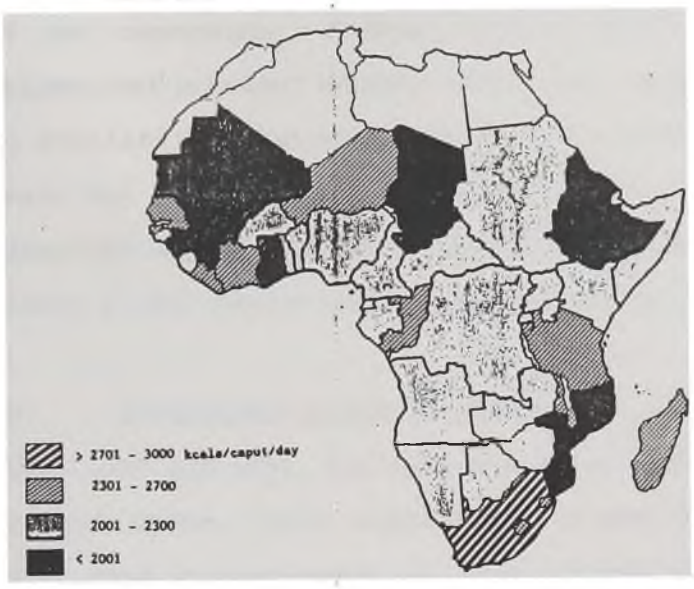
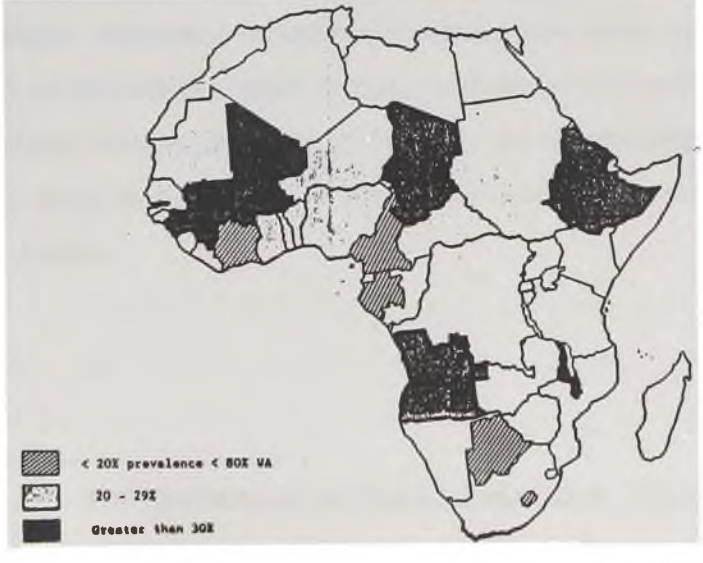
[33] FAO. Report in UN World Nutrition Situation Nov. 1987. p.8.

FIGURE 4A: Food Availability (Kcals/caput/day) in Subsaharan Africa, 1979/81.



(Source: FAO, 1985)

FIGURE 4B Estimated Prevalences of Underweight Children in Subsaharan Africa, (1980). (Based on weight-for-age, WA).



(Source: UNICEF, 1985)

Figure 4A shows the availability of food in Sub-Saharan Africa between 1979 and 1981. It indicates seven countries including Ghana and Ethiopia which were in grave problems as far as available food was concerned. Fifteen of the other countries had food supplies that provided between 2001-2300. Only seven countries had food availability between 2301-2700 kcals/caput/day. Figure 4B reveals the estimated prevalence of underweight children in Sub-Saharan Africa. Indications are that, up to about 30 percent of children in the region are underweight due to inadequate nutrition.

3.20 NUTRITIONAL STATE IN GHANA

Between 1980 and 1987, the consumer price index (CPI) rose by 1500 points in Ghana, which accelerated growth during the crisis of 1983. Food prices began to rise during the drought years of 1982/83, but fell sharply relative to the CPI in 1984, and stayed low until mid 1987.[34] Throughout this period, malnutrition levels were elevated from 1982 through 1985. From the experience in the country, economic crisis and other man made and natural disasters such as droughts, bush fires, and desertification actually brought malnutrition within their trail. It is during such crisis periods that more and effective measures are warranted to protect health and lives.

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[34] FAO Report in UN World Nutrition Situation Nov. 1987 p.9

Malnutrition rates are seen to respond to droughts and food shortages, and price inflation from one year to another. This experience is also common in the seasonal patterns of malnutrition. The peak of Ghana's malnutrition was in 1983 and declined thereafter till late 1987 when malnutrition showed an upward surge again.

A recent report on malnutrition in Ghana by the Ministry of Health reveals that some parts of the country particularly, the Upper East Region have almost perpetual cases of Protein Energy Malnutrition (PEM); according to the report, the rate of malnutrition at the end of 1991 rose to 77 percent above the 62 percent recorded in 1989, and 70 percent in 1990. This trend has been brought about because more families have been experiencing the effects of food shortages.[35] The report continues that worse forms of PEM. were seen in health institutions during the period and mortality and morbidity from nutrition related conditions were high. From this analysis it is envisaged that if something definite like the importation of food from other regions is not embarked upon to correct the situation, malnutrition is expected to rise well above 80 percent in 1992.

Food production statistics show a poor performance with cereal production declining to 14 percent in 1976-1981 compared to 1971-1975 figures. Production of starchy staples declined by 35 percent

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[35] People's Daily Graphic, Wednesday, June 10, 1992.p. 16.

over the same period. In 1981, per capita calorie consumption was estimated to be only 68 percent of the acceptable requirement, a level lower than what occurred in any other African country.[36]

During this period of 1983, the food situation in Ghana was estimated to have been more difficult for the food purchaser than the producer. The consumer, whether a producer or a purchaser of foodstuffs, faced severe hardships in the late 1970's, and early 1980's. This difficulty was caused by rising prices which never subsided until the end of the drought in 1984.

After the acute food shortages of 1983, the government requested 250,000 metric tonnes of emergency food aid, which coincided with favourable weather conditions and massive cropping all over the country, which increased food yields considerably, especially maize, rice, cassava, yams, beans, groundnuts, millet, and sorghum. This bumper harvest in 1984, which was still supported with imports and food aid improved the nutritional status from 1985. Estimates reveal that in 1980, levels of underweight were around 35 percent in 1981, they ranged from nearly 40 percent prevalence of low weight-for-age.[37]

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[36] UN. Update on Nutrition Situation 1989 p.60.

[37] UN. Update on Nutrition Situation 1989 p.61.

The effects of resource flow to hospitals is a vital part of the maintenance of the health of patients that any interruption in its supply is most likely to jeopardize the speedy recovery of patients. In other words, the efforts of the personnel at offering quality health service becomes heavily hampered if the required resources are not delivered in adequate quantities at the right time. For instance, it was stated about Korle-Bu Teaching Hospital that, "the large bed capacity and additional function of teaching medical students have put great pressure on all available resources, and due to severe shortage of funds and personnel, this complex hospital has now virtually ceased to function efficiently and effectively either as a general or teaching hospital or both."[38] This statement underscores the role of resources namely, money, personnel, drugs, equipment,and others in effective health service delivery.

3.22 DRUGS

One of the most important supplies to every hospital is drugs. Drugs are usually allocated to hospitals from the Central Medical Stores through the Regional Medical Stores.

Even though, hospitals are now permitted to purchase drugs from the open market when they are not available from government sources, the procedure to obtain a nil certificate which will entitle a

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[38] Final Report On The Administration And Management of the Korle-Bu Teaching Hospital, June 1985, p. 19

hospital to purchase from outside is very cumbersome, and difficult. This new procedure opens the way, for hospitals to acquire a range of drugs to suite their services, subject to the availability of money to pay for them.

The Korle-Bu report speaks about the process of supplies that they are at times uncertain of what is to be received. The reason for this statement is that, the hospitals are sometimes coaxed to collect some drugs and supplies which they do not need specifically. For instance at the children's hospital, there were several anti hypertensive drugs in the store which was said to be expiring at the Regional Medical Stores and was thus forced on the hospitals to prevent the Regional Store from running into trouble with expired drugs.

Supplies of drugs are erratic, inadequate and sometimes without regard to their usage in the hospitals. As a result of the erratic supply of drugs, it is very difficult for most hospitals to carry adequate stocks and maintain economic order quantities to guarantee smooth operation. The inability to build maximum and minimum quantities makes it difficult for Medical Officers who often are not aware of what is available to work smoothly. Worse of the problem is with the storekeepers and Dispensary Technicians who at times do not know what is in stock and stifle the issuance of drugs till they expire.

Prior to the commencement of the cash-and-carry system, drug issuance to hospitals were not priced, this situation made it difficult for the hospitals to determine how much they were spending on drugs.

3.23 FOOD

All government hospitals in Ghana provide meals at subsidised fees for their patients. Before October 1991, hospitals had the individual institutional responsibility of arranging their own raw food supplies while the government provided the overhead subsidy. This system of individual purchasing of food was said to be very difficult, time consuming and saddled most hospitals with financial debts, and also prevented them from providing decent meals for their patients. The main difficulty was attributable to the unrealistically low per head subsidy which the government paid to the hospitals.

With the coming into effect of the Tender Board System of supplying food to the hospitals through designated food contractors, the pressure has been taken away from the hospitals. At the moment, what the hospitals do is to request for what they need based on their requirements, and the food contractors supply them. The bills are then forwarded to the Regional Tender Board for approval and payment.

At the PML., where food forms an important part of the therapeutic regimen, the administration and the kitchen were under incessant pressure to reduce their cost of feeding patients, while nutritionally, the children needed more food in terms of quality and quantity to help them recover in a good time. This problem was a real conflict of interest which is said to have been abruptly resolved with the intervention of the Tender Board administered supply system.

3.24 TRAINED PERSONNEL

Trained personnel in the delivery of health care is most indispensable as the health service is a labour intensive profession that cannot be substituted with technology.

The personnel of hospitals are generally grouped under Medical, Nursing and Para-Medical staff. The required number of doctors in most hospitals in Ghana is fewer than expected yet their work is heavily augmented by the presence of well trained and disciplined nurses. Nurses are usually quite well provided in most hospitals due to the numerous training facilities in the country and also due to the fact that being a predominantly feminine profession, most of them prefer to stay in the country unlike doctors who leave to further their education and to seek better job conditions outside the country.

During the recent industrial action embarked upon by nurses which began in May 18, 1992, in protest against inadequate remuneration,

the work at the PML. was brought to a complete standstill. The three medical officers were completely overwhelmed and there were reports that some children died because of the absence of the nurses who do the bulk of the work on the wards.[39]

At the PML., even though much of the work of caring for children is done by the nurses, the supportive role played by mothers and caretakers is very significant and affects the recovery rate of their children in no small way.[40] Caretakers are very much involved in the care of the children that the amount of food they eat and plate loss is dependent on their ability to coax their children to eat their ration. In this regard where mothers are found to be uncooperative, stubborn and truants, the rate of recovery of their children becomes adversely affected. It is at times reported in the hospital that some mothers particularly the teenage ones who do not care about the lives of their babies go to the extent of eating their children's ration.

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[39] Rhule,G., Peoples Daily Graphic. 8 June, 1992,p.1

[40] Wilson,G.Personal Experience At The PML. in Bulletin of Noguchi Memorial Institute for Medical Research. Jan. 1991,Vol 4 1 p.64.

CHAPTER FOUR

4.0 METHODOLOGY

4.1 POPULATION AND SAMPLING PROCEDURE

The selection of subjects for the study was limited to the staff of the PML and the caretakers whose children or wards were admitted for treatment .

Most of the caretakers were women, mostly mothers of the children, but it was quite common to find grandmothers who were permanently caring for their malnourished grandchildren.

In assessing the health of malnourished children admitted to the hospital, about four methods were identified namely, the length of stay, amount of food and drugs consumed, the number of live discharges and death rate.

The amount of food consumed offered a good criteria for judgment because one symptom of malnutrition is heavy weathering of appetite; while signs of recuperation in malnourished children is avaricious eating. Furthermore, as the major therapeutic element for the correction of malnutrition, feeding provided a useful yardstick to assess the healthy state of the children.

Thus, as the rate of food and drugs consumed by the children increased, there was the expectation of a decrease in length of stay. That is, as the intake of food and drugs increased, the length of stay of malnourished children was expected to show a

decrease relationship.

Algebraically, this can be represented as follows:

Let y = length of stay of malnourished children

x = amount of dietary intake

z = amount of drug intake

Therefore:

$$Y = f(x,z) \qquad \text{where } x = \{x_1, x_2, \ldots x_i\}$$

$$z = \{z_1, z_2, \ldots z_i\}$$

In this equation, X and Z are the independent variables while y is the dependent variable. Thus, as more of x and z are provided and consumed, it is expected that y will be inversely affected. It is hoped that an independent variable which affects the dependent variable can be determined through multiple regression.

4.2 REVIEW OF HOSPITAL RECORDS

Information on the usage of food and drugs were obtained through a review of the existing records of the hospital which were maintained by the kitchen, pharmacy and the Records Department. Records of food usage were reviewed from 1988 to 1991. The amount of food used for each month was listed and out of these, some of the essential ones like beans, fish and maize were noted for discussion.

Unfortunately, data on drug usage was not very elaborate because for several years, no information had been kept on drug purchases and usage. Owing to the numerous kinds of drugs in use at the hospital for both in and outpatients as well as for staff, selected

drugs which were considered very vital for maintaining the health of malnourished children were used.

Data on the length of stay of malnourished children at the PML is kept in a nominal rolls book at the Records Department. Unfortunately, owing to renovation works which had just been completed at the time of the collection of this data, many of the vital documents had been lost due to the movement of the entire department to a new building. This notwithstanding, enough data on the length of stay of malnourished inpatients was obtained from January 1988, to December 1991. However, details of some information were not succinctly available. Thus, the analysis of how resource flow influences the length of stay would be based on available data for the four years mentioned, that is, 1988 to 1991.

It was also intended to analyse the information to depict how the different types of malnourished cases stay in the hospital. This would have permitted an interesting inference to be drawn on how the variables being studied affect each of the three stages of malnutrition. For this too, data to depict such occurrence were only available from January 1989 to June 1990. While serious attempts were made to collect every available data relevant to the study, it was discovered that some information pertaining to some months were not available; simply because either the staff responsible had not done what was expected of them or that the

sheets on which the information had been recorded were completely missing.

To arrive at the average length of stay for the months, all the individual lengths of stay were summed up and divided by the number of cases presented for the month. For some particular months an unusually long length of stay was discovered. This was apparently influenced by the presence of some abandoned babies who had stayed in the hospital for over one year. These unusual cases were not included. During the years of 1990 and 1991, monthly statistics on the length of stay were provided on ward bases.

4.3 INTERVIEW OF STAFF

The staff of the hospital interviewed were mainly nurses, a medical officer, pharmacist, nutritionist and a dietitian.

Apart from the nurses who were many and had to be randomly sampled, the other categories of staff were not sampled because only one staff each was in that position. Fifteen out of 69 nurses were selected through random sampling and individually interviewed using interviewer-administered questionnaire. The Medical Officer in charge, the pharmacist, dietitian and nutritionist were also interviewed through a interviewer-administered questionnaire. This interview technique was chosen because the staff in the first place preferred it to any other procedure. Moreover, the technique worked out well because it did not isolate the subjects from the

interviewer. Also, most of the staff preferred this technique as it could be answered while they were going about their normal schedules.

4.4 INTERVIEW OF CARETAKERS

Ten caretakers were selectively sampled from those who were caring for their children in the hospital. The reason behind the selective sampling was to eliminate any language barrier between the interviewer and the interviewee. Here again, the interviewer-administered interview was employed.

4.5 VARIABLES

The variables to be investigated were food, drugs, money and personnel. These constituted the independent variables. They were measured against the dependent variable, that is the number of days spent in the hospital, or the average length of stay.

The amount of food and drugs consumed per patient was also determined.

4.6 DATA COLLECTION

The interviewer-technique was employed throughout the research. Other information were obtained from secondary sources like annual reports of the hospital, and published information and general literature on malnutrition.

4.7 DATA ANALYSIS AND INTERPRETATIONS

The data collected was entered into a computer at the Computer Science Department and an SPSS software used to analyse it through regression analysis.

CHAPTER FIVE

5.0 RESULTS AND DISCUSSION

Information on inpatient statistics revealed that malnutrition is a seasonal problem in Ghana, or precisely, Southern Ghana which constitutes the main catchment area of the hospital. With this background information, statistics show that some months have only a thin number of inpatients who are admitted under very severe conditions, which prolongs their length of stay and reduces their chances of survival.

Table 3 summarises the average length of stay and death rates for the various months between 1988 and 1990. The lengths of stay range between 13 and 57 days that is, 2 and 8 weeks. The number of short stay cases that resulted in deaths however obscure the true picture. In hospitals cases resulting in deaths are technically recorded as discharges. It can be seen from the table that in most months showing higher death rates, the lengths of stay are generally lower than those with fewer deaths.

The cases that resulted in deaths were explained to have been very severe cases which were delayed at home before reporting to the hospital. Thus, there was very little the hospital could do to prevent the occurrence of death. The duration of the death cases in hospital ranged between 1 and 52 days. Such unfortunate deaths can only be prevented through effective counselling throughout the following catchment areas; Bukom, James Town, Sabon Zongo, Adabraka, Russia - a suburb of Accra. Other areas are Winneba, Senya Breku and Kpone. These towns are predominantly populated by

people of low socio-economic status and therefore constitute potential areas for widespread malnutrition among children.

TABLE 3 AVERAGE LENGTH OF STAY (ALS) -(1988-1991)

	YEARS							
	1988		1989		1990		1991	
MONTH	ALS	DTH	ALS	DTH	ALS	DTH	ALS	DTH
JAN	28	-	43	6	34	3	36	15
FEB	25	19	24	5	33	6	40.5	2
MAR	25	14	35	5	19	2	31	5
APR	35	8	30	3	36	3	36.5	-
MAY	33	11	26	15	25	4	27	11
JUN	27	8	28	7	20	10	36	3
JUL	31	8	18	15	57	9	23	19
AUG	25	4	28	9	13	8	38	15
SEP	35	5	33	3	19	8	42	6
OCT	31	4	28	-	33	13	24	10
NOV	27	4	32	2	-	9	39	7
DEC	14	7	21	6	45	4	35	1

5.1 OCCUPANCY RATES IN THE HOSPITAL IN 1991

Statistics showing the occupancy rates in the hospital were compiled on ward basis for 1991 as follows:

CARITUS ITALIANA WARD	CI
SUSAN OFORI ATTA WARD	SOA
CECIL WILLIAMS WARD	CW
REV. CAMPBELL WARD	RC

TABLE 4 PERCENTAGE OCCUPANCY RATES FOR 1991

	WARDS				
MONTH	CI	SOA	CW	RC	TOTAL
JAN	64	46	71	61	60.5
FEB	53	69	60	62	61
MAR	62	42	55	49	52
APR	53	51	60	48	53
MAY	53	55	57	40	51.25
JUN	-	37	43	55	45
JUL	52	-	44	44	46.66
AUG	62	16	69	54	50.2
SEP	55	58	68	47	57
OCT	35	47	63	42	46.75
NOV	51	38	55	38	45.5
DEC	71	36	44	47	49.5
AVE. OCCP.*	55.5	45	57.4	48.9	51.5

*AVE. OCCP. (Average Occupancy Rate)

The percentage occupancy rates indicate that throughout 1991, only two wards, Caritus Italiana and Cecily Williams in January and December had occupancy rates above 70. The rest of the wards had an average of 50 percent occupancy rates. The occupancy rates therefore prove that the hospital is carrying excess capacity in its wards and can thus extend part of its facilities to care for general medical cases. This assertion will however be possible only if there is a pediatrician available, because the two full time Medical Officers are most often overwhelmed by the presence of numerous outpatients during the day.

The advantage of extending the inpatient facilities to cover other general paediatric cases was intimated by the medical and nursing staff that it would introduce a change in their services and ease the boredom of repetitive caring for only one case mix at the wards. Probably, this assertion underlies the high motivation of the staff to do more challenging work as their training will permit them. One nursing staff interviewed on the nature of their work with only malnourished children to care for, admitted that they were losing most of their basic midwifery and other nursing techniques which are not necessary with caring for malnourished children.

The Ministry of Health or the Regional Medical Office could therefore cash in on this to increase the case mix of the hospital

without infuriating the staff, but rather increase their motivation towards achievement, while at the same time taking the mounting pressure of cases from other hospitals, especially Korle-Bu and the Ridge Hospitals in Accra.

5.2 ANALYSIS OF FOOD USED IN 1988

Quantities of maize, yams and rice are assessed from tables 5,6,7,and 8. Based on the calculated requirement of the kitchen, it was estimated that about 198kg of yams would be the ideal quantity for the hospital per month for an average of 50 patients. However during 1988 (table 5), there were heavy short falls in the supply of yams for 10 months, these ranged from 175kg in July to 80.5kg in November. The shortfalls were attributed to several factors. For instance, yams are delivered in tubers and it is almost impossible for the supplier to deliver yams which have been weighed on the market, again yam is a very seasonal food item so when its price shoots up during the lean season, it becomes economically necessary to substitute it with other cheaper commodities like maize or rice. The data indicates that so much of maize was consumed above the required quantity to make up for the shortfall in yams. Maize consumption for 1988 on table 5 shows that for 5 months, between May and September, there were no shortfalls below the estimated 400kg. During this same period, the consumption of rice was also high, even though shortfalls below the projected 138kg were indicated. Throughout the year the consumption of carbohydrates was quite encouraging even though

short falls were common. The shortage of carbohydrates, particularly maize and yam show seasonal availability on the market. The usage of these foods show erratic behaviours which makes it difficult for adequate feeding and proper management. The shortages in these principal foods also indicate that somehow the children were under fed, because the required quantities were not available throughout the year.

TABLE 5: CONSUMPTION RATE OF SELECTED FOOD ITEMS

1988

MONTH	MAIZE KG	YAM KG	RICE KG	BEANS KG	G'NUTS KG	SMOKED FISH KG	KONTOMIRE KG	P'OIL LT
JAN	329	153.9	96	31	8.9	10.1	3.1	15
FEB	300	118	97	28	8.8	-	6.8	16
MAR	293	105	49	15.8	8.9	-	11	20
APR	350	98	100	20	8.8	12	12.9	16
MAY	400	120	100	25.6	14.9	13.2	23	20
JUN	400	78.7	100	19.8	12.5	18.6	16.3	16
JUL	450	175	125	25	20	14.48	18	20
AUG	450	67	125	25	25	20.1	19.2	20
SEP	400	62	100	-	5	11.7	17.4	24
OCT	300	132	100	-	20	14.9	26.8	20
NOV	300	80.5	100	-	20	19.7	20.5	20
DEC	300	181.3	100	-	25	14.9	16	16
GRAND TOTAL	4272	1371.4	1192	190.2	177.8	149.68	191	223

TABLE 6: CONSUMPTION RATE OF SELECTED FOOD ITEMS

1989

MONTH	MAIZE	YAM	RICE	BEANS	G'NUTS	SMOKED FISH	KONTOMIRE	P'OIL
JAN	200	103.7	-	-	20	9.3	5.6	4
FEB	250	187	100	17	10	11.9	3.7	16
MAR	400	191.6	100	33	10	18.2	7.8	16
APR	400	131.6	-	28	10	21.9	13.2	8
MAY	400	131	100	20.3	24	22	24	4
JUN	400	82	100	20	10	16	16	16
JUL	350	85.4	138	20	20	-	12.5	4
AUG	370	112	89	21	38	30.7	16.3	16
SEP	380	128	88	25	40	24.3	13.5	16
OCT	350	147	89	30	30	29.8	12.5	16
NOV	350	-	49	21	35	13.5	-	16
DEC	350	126	83	21	35	15.1	11.8	8
TOTAL	4200	1425.3	936	256.3	262	213.2	136.9	140

TABLE 7: CONSUMPTION RATE OF SELECTED FOOD ITEMS

1990

MONTH	MAIZE	YAM	RICE	BEANS	G`NUTS	SMOK.FISH	KONTO	P`OIL
JAN	200	153.9	88	25	18	-	8.3	12
FEB	220	118	45	20	21	19	4.5	16
MAR	200	105	100	25	25	18.9	4.7	16
APR	200	98	100	20	20	16.7	6.6	8
MAY	200	120	91	25	23	16.5	10.6	16
JUN	250	78.7	100	20	21	-	11.3	16
JUL	200	106.1	100	25	25	14	15	16
AUG	200	67	120	25	25	24.1	11.4	21
SEP	200	62	108	18	25	27.7	10.7	21
OCT	200	132	94	12	25	34.7	19.3	21
NOV	200	84.3	94	13	15	27.1	13.3	12
DEC	200	181.3	117	30	25	27.1	25.9	12
GRAND TOTAL	2470	1306.3	1157	258	268	225.8	141.6	187

TABLE 8: CONSUMPTION RATE OF SELECTED FOOD ITEMS

1991

MONTH	MAIZE	YAM	RICE	BEANS	G`NUT	SMOK.FISH	KONTO	P`OIL	ORGE.	BANANA
JAN	150	166.2	100	20	13	25.9	14.7	18		
FEB	200	203	100	23	25	21	20	17		
MAR	200	199.2	74	-	25	24.8	16.2	13		
APR	150	266.9	50	13	-	35.4	20.4	-		
MAY	200	177.7	100	30	25	24.1	20.6	8		
JUN	150	169	100	7	25	24.1	23.4	8		
JUL	150	219	75	-	-	30.8	33.8	4		
AUG	100	217	100	30	-	28.8	34	9		
SEP	200	372	125	20	-	45.5	24	9		
OCT	200	244	150	31	32	70	31	16	198	105
NOV	200	124	150	31	32	46	21	27	93	50
DEC	200	213	100	31	30	39	26	27	104	87
GRAND TOTAL	2100	2571	1074	236	207	415.4	285.1	157	395	242

5.3 PROTEINS

Beans, groundnuts and smoked fish the principal protein energy foods show the following trends.

The required ideal quantity of smoked fish per month of 63.7kg. reveal shortfall throughout the year. A critical look at the cumulative number of patients fed in the year shows that the average was 44. This reduces the average requirement of 63.7kg. of smoked fish required for 50 patients to 34kg. per month. Even with this proportional figure, the hospital still experienced shortfalls of the principal animal protein nutrient. The ideal requirement of 31kg. per month for beans was quite closely met. Table 5 shows that the shortfalls were reasonably small. Available figures on beans usage for 1988 indicate a heavy short fall in March and June, with 15.8kg and 19.8kg respectively. All the other months indicate a usage bothering around the ideal quantity.

Groundnuts usage show an inappreciable trend of shortfalls throughout the year, with September showing the worst shortfall of 27kgs. below the required 32kgs. specified as ideal for the month. There was no data indicating the usage of fruits.

Kontomire and palm oil which are also important food items containing essential nutrients do reveal erratic supply and usage While about 30kg. of kontomire was projected as the ideal quantity, data for January reveals a very low figure of only 3.1kg and 6.8kg. in February. The highest usage of 26.8kg was recorded in October

(table 5). Palm oil had a smooth supply ranging between 15 lites and 20 litres. Even though the usage fell short of the expected requirement, the consistency of its flow could make it easier for adequate planning.

1989

In 1989 the usage of maize was encouraging; March to June had adequate quantities as was projected, and some small short falls from July to December. In this year, quite apart from January and February, the other months depicted consistent supplies of maize, which could be considered as the principal calory providing food at the hospital. Table 7 shows that the consumption of yams and rice were short of the projected quantity of 198kg and 138kg respectively.

5.4 PROTEIN

The supply of smoked fish throughout the year depicted shortfalls below the expected ideal of 63kg. The lowest usage was 9.3kg. in January and the highest usage of 30.7kg. was recorded in August. Throughout this year, there was a donation of tinned sardines from the National Commission on Children. Thus, the hospital could afford to use less of its limited resources on smoked fish. Beans was used in adequate quantities close to what was required. The quantity supplied was also quite regular without too much short falls. Table 6 shows that groundnuts was less used from February to June apart from May. All the other months from August indicate

excess usage above the required quantity. It could be that more groundnuts was used to supplement beans which was less used. The explanation could also be due to their price difference on the market in favour of groundnuts.

5.5 KONTOMIRE AND PALM OIL

Palm oil usage was around 16 litres per month for seven out of twelve months with January, May and July indicating 4 litres each. The 16 litres of palm oil per month was adequate for the relatively fewer number of inpatients in that year. The stipulated requirement of 27 litres per month is based on a projected number of 50 patients. Thus an average of 30 patients per month makes the required quantity of 16 litres of palm oil. To this end, seven months in the year, the hospital was adequately provided with palm oil as is depicted on figure.

If the same basis for calculating a required quantity for 30 patients is used for kontomire, then, the required average is 18kg. This figure is arrived at by dividing 30 by 50 and the fraction multiplied by the stipulated quantity for the month.

Table 6 indicates that kontomire still showed short fall even with a lower average requirement of 18kg per month except May, in which 24kg was used and also in June and August when 16kg was used.

1990

Table 7 indicating maize usage for 1990 shows a smooth and consistent supply of 200kg with June almost at the peak. With this

consistent supply, it could be said that based on the number of patients served, the quantity was adequate. The average number of patients served per day from the cumulative figures for the year is 39. Based on this, the projection of required maize usage is 218.4kg. Table 7 further shows that throughout 1990 the consumption of maize was adequate, apart from June when 250kg was used. All the other months had a usage of 200kg which is only 18kg below the deflated quantity.

The consumption of rice was quite below the projected requirement of 138kg for an average of 50 patients. Rice usage for 1990 indicate shortfalls throughout with February showing the highest shortfall of 93kg. On the average the supply was 100kg from March to November. August and December were the months with the highest usage rates of about 120kg. The supply and usage of rice was below the deflated quantity of 107kg for 39 patients.

5.6 PROTEIN ENERGY FOODS

With protein energy foods the usage was quite appreciable for beans and groundnuts which showed a usage close to the ideal required to feed the patients. A proportionate figure required to feed the average 39 patients was 24kg for beans and groundnuts. Table 8 reveals a usage which was above this ideal figure for six months.

5.7 KONTOMIRE

The usage of kontomire showed a very low trend or a high deviation from the standardized quantity of 30kg for 50 patients. If this figure is deflated for 39 patients, the requirement of 23kg that was needed per month was only met in December and quite closely provided in October when 19.3kg was reportedly used. All the other months indicate heavy shortfalls ranging from a monthly usage of 4.5kg. in February and March to 15kg in July. Even though kontomire is a seasonal vegetable, its peak season did not reveal an optimum usage. It is likely that the kitchen may have used other substitutes like garden eggs in place of kontomire.

1991

From the cumulative patient load for 1991, it is seen that the year was very busy as far as inpatients were concerned. The average patient load was 47.

5.8 CARBOHYDRATES

The usage of maize for this year was unfortunately far below the required quantity of 280kg throughout the year. The deflated quantity for an average of 47 patients per month was never met in any month.

Rice usage also indicating shortfalls below 138kg per month was more frequently used than in the previous year. Only three months in the year indicate a usage below 100kg, with October and November

indicating 150kgs each above the required average.

Yams was heavily used to supplement the short fall in maize and rice as the table 8 indicates substantial usage in 8 months above the required 198kg per month. It was only in November that yam recorded a heavy shortfall. All the other months show an excess or close usage to the required quantity. Thus, for 1991, yam was virtually overused to reduce the shortfall in other carbohydrates.

5.9 PROTEIN ENERGY FOOD

Smoked fish as a source of animal protein continued to be a problem as shortfalls were recorded from January to August. However the usage improved after the take-over by the Tender Board in September. From September, there was a dramatic turn in the quantity of smoked fish used. Substantial amounts of smoked fish was used in October. This was actually the period which coincided with the take-over by the Tender Board supply system. Food Contractors supplied the required quantities to prove that they were more capable of doing the business of supplying health institutions with food items than the institutions could purchase from the open market with monies drawn from the government treasury.

Beans and groundnuts were quite well provided from August to December, though the early months suffered minor short falls. The usage of proteins as a nutrient was quite close to the previous years figures.

5.10 KONTOMIRE AND PALM OIL

The quantity of kontomire used throughout 1991 was just about the required quantity needed except for January and March. The usage was encouraging throughout the year and a very big improvement over the previous year.

For the first time in the records of the kitchen, oranges and bananas were served in the hospital during the last quarter of 1991 as a normal part of the meals, this was made possible through the effort of the Tender Board system.

5.11 PRINCIPAL DRUGS USED AT THE PML

A wide range of drugs are used at the PML to treat the cases presented at its Outpatient and Inpatient Departments. Some of these drugs are so sensitive and important to the therapy of the malnourished children and other cases that, the Pharmacist describes the hospital as "empty" without them. Even though food is deemed to be very essential, because of the low resistance of malnourished children and the various diseases which accompany their ailment, drugs are also seen as very important and indispensable in the complete recovery of malnourished children.

The drugs which are most frequently used are grouped by the Pharmacist in the following classes.

Antibiotic Injections

Procaine Penicillin and Christallin Penicillin.

Syrups

Paracetamol, Septrin, Amoxacillin, Cloxacillin, Multivite, Vitamin B-Complex, Septrin, Chloroquine.

Infusions

Dextrose Saline, Ringers Solution, Darrows Solution

Oral Rehyration Salts.

Data on the usage of drugs were not available in the hospital except for those from September 1990 to December 1991. The reason for this unfortunate incident was attributed to the renovation of the hospital which had forced the pharmacy to move out of its original habitation. It also looked apparent that not much importance was given to data on the use of drugs.

TABLE 9 TOTAL COST OF DRUGS CONSUMED IN 1991

DRUGS		QUANTITY	UNIT PRICE(¢)	TOTAL COST
Injection Chloroquine	(5mls)	6865	55	377,575
Chloroquine Syrup	(1lt)	2206	1127	2,486,162
Paracetamol Syrup	(1lt)	1569	980	1,537,620
Chloramphenicol Syr.	(250ml)	4727	300	1,418,100
Multivite Syrup	(1Lt)	528	971	512,688
Septrin Syrup	(250ml)	7408	420	3,111,360
Injection Proc. Pen.	(50ml	2150	250	537,500
Infusions	(50ml)	107	500	53,500
Oral Rehydration Salts		1147	54	61,938
TOTAL				¢10,096,443

Table 10 matches the cost of drugs against that of food bills to find out their combined effect on the length of stay in 1991. In order to be able to compare and appreciate the dual effects of food and drugs on the length of stay of malnourished children in the hospital, both variables are converted to cash values.

TABLE 10 THE EFFECTS OF FOOD AND DRUGS ON LENGTH OF STAY IN 1991

MONTH	FOOD BILL	DRUG BILL	NO.OF	AVERAGE	AVERAGE LENGTH OF	DEATH
		¢	PATIENTS	COST(¢)	STAY (DAYS)	
JAN	147,090	977,300	1475	762.2	36	15
FEB	166,365	260,700	1366	312.6	40.5	2
MAR	152,280	520,370	1364	493.1	31	5
APR	152,880	385,850	1310	411.2	36.5	-
MAY	157,470	420,120	1291	447.3	27	11
JUN	145,970	609,771	1071	705.6	36	3
JUL	157,570	1,144,750	1246	1,045.2	23	19
AUG	149,120	1,308,728	1420	1,026.6	28	15
SEP	234,360	640,560	1384	632.1	42	6
OCT	396,440	1,046,595	1091	1,322.6	24	10
NOV	304,500	622,390	1191	777.8	39	7
DEC	342,877	841,876	1395	849.2	35	1

The number of patients indicated are cumulative throughout the months.

5.12 EFFECTS OF FOOD ITEMS ON LENGTH OF STAY

It was stated earlier in the methodology that multiple regression analysis would be used to determine the significance of the variables contained in the research. The results are presented below.

Dependent Variable - Average Length of Stay.

TABLE 11 EFFECTS OF FOOD ITEMS ON AVERAGE LENGTH OF STAY

Variable	B	SE B	t stats.
Yam	-.19083	.14721	-1.2963
Smoked Fish	-1.55184	.45322	-3.4240
Rice	-.77631	.24658	-3.1483
Groundnuts	6.30178	1.41842	4.4428
Maize	-.66237	.25654	2.5819
Palm Oil	-3.21567	1.01598	-0.3165
Beans	-1.01788	.77091	-1.3203
Kontomire	-2.51034	.85517	-2.9354
(Constant)	190.62790		
Adjusted R Square	.75504		

(The independent variables are the food items, while they collectively influence average length of stay as a dependent variable)

From the above, 'B' is the regression coefficient, while 'SE B' measures the standard error in the 'B'. The 't' statistic indicates the extent of influence of the independent variableon the length of stay. For instance smoked fish has a strong inverse relationship of -3.4240 on the length of stay. The implication is that, as more of smoked fish is consumed, the rate of recovery increases. Under the 't'statistic figures indicating negative intergers and above 2 have a significant inverse relationship on the length of stay. This therefore permits the determination of how important each of the independent variables affect the dependent variable-average length of stay.

The constant of 190.62790 in the regression analysis indicates an interesting phenomenon which will occur if all the independent variables were held up or removed. In this regard, it may take about 190 days or even more for a malnourished child to regain its health on non-nutritious diet, but on drugs alone.

The adjusted R of .75504 measures the total significance of all the independent variables, that is their combined effect on the average length of stay. It indicates a 75 per cent effect on the average length of stay. It was earlier stated that beside food nutrients and drugs, other incalculable or intrinsic factors like maternal, nursing, medical and environmental factors also affect the length of stay of the children. It can now be determined that all the other factors other than food nutrients account for the remaining 25 per cent, which is also a significant proportion to reckon with.

Analysis of figures under 'B' in the regression indicates that some of the individual food items like yams, smoked fish, rice, maize, palm oil, and beans affect the average length of stay if they are increased constantly over a period. For instance, an increase of yam by 100 per cent per unit will likely reduce the length of stay by about 19 per cent. In that same way smoked fish will reduce the average length of stay by about 155 per cent per a certain constant increase. From the regression analysis, palm oil seems to affect the level of health most, it reduces the length of stay by about 321 per cent per constant unit of increase. Kontomire and

Groundnuts on the other hand adversely affects the length of stay and for that matter the health of malnourished children as they are increased. Groundnuts increases the length of stay by about 630 per cent per unit of constant increase. This phenomenon is probably due to the high content of oil which does not favour the health of children. Kontomire on its part increases the length of stay by about 251 per cent per a certain constant increase over time.

5.13 FOOD USAGE

At the Princess Marie Louise Hospital (PML), the main food nutrients used for feeding and correcting protein energy deficiency related diseases and calorie deficient related diseases are protein and carbohydrate foods. The principal protein energy foods used are beans, groundnuts and dried or smoked fish. Calories are derived from maize, rice, and yams. Other nutrients which also contain fats, proteins and vitamins in high use are skimmed milk, palm oil, kontomire and fruits. Skimmed milk is usually used for kwashiorkor patients to induce diarrhoea to reduce the accompanying oedema, and also to increase their protein energy. Unfortunately, the usage of skimmed milk is erratic because its supply depends on donations from the Catholic Relief Services. There was no data showing the trend of its usage.

It was determined that the PML. undertakes portion control of food nutrients as against metabolic control in its feeding practices.

It had therefore been predetermined that a malnourished child needs at least 2 ounces of protein per meal, while the same child needs 8 ounces of carbohydrates per meal for quick recovery. This basic portion control thus, takes care of the feeding needs of the children throughout their nutritional therapy.

In order to increase the vitamin content of food given to malnourished children individual caretakers are encouraged to supplement the diets of the children with oranges and bananas, the principal fruits used in the hospital. Indications in the hospital was that any time the hospital had donation of fruits, they were served in addition to the normal meals. The third group of food items which were studied are kontomire, palm oil, banana and oranges.

The usage of rice was very irregular in 1989 as reflected on table 6, with January and April without any information for comparison. However, the trend shows a peak usage in July with most of the other months flattening up around 100kg. November had the lowest usage of 49kg.

Yam was quite heavily used to supplement rice and maize particularly from January to April. On the whole, the average daily number of patients of 30 per month in 1989 indicate a significantly lower figure than the 44 patients experienced in 1988. In this regard, the food shortfalls in 1989 could be

attributed to the relatively fewer patients.

On the whole, the flow of food to the hospital in 1989 based on the deflated figures of an average of 30 patients per day indicate that the supply of food was quite favourable, and that the children were adequately fed on carbohydrates, protein and vitamins.

Based on deflated figures for 1990, the requirement for yam for 39 patients is 154 kg. There is however, a contingency provision for extra 10 children to make up for any unforeseen and eventualities such as spillage, pilfering, consumption by staff and others.

With this background, yam usage indicates varying shortfalls from February to November of 1990. June shows the biggest shortfall, with only 78.7kg. This is depicted diagrammatically on appendix 4. The short fall is however supplemented with maize which indicates an unusually high consumption of 250kg in June. It is clearly seen in this month how maize is easily supplemented for other carbohydrates, because it is a reasonably cheaper substitute.

With respect to smoked fish, there were short falls throughout 1990, with the first seven months showing the worst quantities. With deflated figures for 39 patients, the average of 49kg was not met. The data on table 7 indicates the inadequacy of animal protein in the diet of the children throughout the year as shown on appendix 6.

Data on food usage in 1991 was encouraging for protein energy nutrients and vitamins. Even though maize and rice usage were low, the consumption of yam made up for much of the shortfall as portrayed on appendix 5. Apart from palm oil, all other food items were well provided throughout the year, with new additions of fruits.

It can be said that the supply of foodstuffs to the PML normally falls short of the expectation of the kitchens required quantity. It was actually intimated through personal interview that, generally, the quantity of meals served at the hospital was below the expected quantity. This situation of insufficient quantity had been a regular occurrence till the take over of supply of food stuffs by the Tender Board.

To prove this point, the nutritionist and dietitian had observed that the malnourished children who had recovered from their weaknesses and were developing appetite for food always cleared their plates and had the desire to ask for more. Such children who were recuperating ate their meals aggressively and accepted supplements from their mothers or caretakers. My personal observation also proved this behaviour and I felt the ration of such aggressive eating children who were recovering from their weakness should have more food than the normal ration that is equally dished out without regard to appetite.

In this respect, those children who would otherwise waste their ration through lack of appetite can have their plate content reduced, in order to provide more for those who need it.

Below are the different energies that can be derived from some of the common food items that are used extensively in the hospital. Eyeson and Ankrah list the food energy that can be derived from 100 grams of edible portion of some commonly used foods in Ghana as follows.

TABLE 12 FOOD ENERGY CAPACITIES

	CALORIES	KILOJOULES	PROTEIN	CARBOHYDRATE
ROASTED CORN FLOUR	374	1574	9.1	77.2
CORN DOUGH	210	879	5.1	45.8
KOKO, PORRIDGE	24	98	0.6	5.0
BOILED RICE	116	486	2.1	28.0
RICE WATER	35	147	0.8	7.8
BOILED YAM	114	477	1.6	27.1
MASHED YAM	145	667	1.9	34.5

(Source: Eyeson, K.K., and Ankrah, E.K. Composition of Foods Common Used in Ghana. June 1975. (Food Research Institute - CSIR) pp 6-15).

From the food compositions listed above, we can compare boiled yam, rice and corn dough. It shows that in all respects, corn dough is higher in all the essential nutrients followed by rice. Thus, when there is a substitution of corn dough foods like banku for rice or yam which are generally seasonally affected, malnourished children get increased food nutrients. On the other hand, if rice is substituted for banku, or rice water for Tom Brown (roasted corn

flour porridge) then, there is a sharp reduction in nutrients for the same quantity of food consumed. From the food energy listed above, as much as about ten times the quantity of rice water has to be consumed to make up for the same value of nutrients derived from Tom Brown. In comparing boiled rice and boiled corn dough (banku), twice as much rice has to be consumed to make up for the same value of nutrients in banku, while that of yam is between 4 and 10 times.

The energy provision derived from yam, rice and maize are compared on bar charts per 100 grams of edible portion in their raw state (Refer to appendix 2).

To begin with, these three principal carbohydrate foods items have different energy providing capacities. Maize is highest, followed by rice and yam in their respective order of energy yielding strength. Thus, merely substituting the same quantity of different food items in terms of weight, would not provide the consumer with the same amount of energy.

It is generally held opinion that in the course of processing food for consumption like boiling, frying, roasting or grinding, some food items change in their energy giving strengths, as it is shown on the food composition list. For instance, Tom Brown (roasted corn flour porridge), banku and koko, all prepared from maize show widely varying food energy strengths in terms of their calories or kilojoules. Besides, their protein, fat and carbohydrate contents also vary.

In the light of the foregoing, there are indications that substituting equal weights of different food items may never yield the same energy requirement when consumed. Besides, it is sometimes not possible to eat some increased quantity of food to acquire the equivalent food energy that can be derived from a higher energy yielding substitute. This point can be made clearer if we compare 100 grams each of Tom Brown and Corn dough porridge (Koko), while the Tom Brown will yield 374 calories or 1574 kilojoules, the same amount of koko will yield 24 calories or 98 kilojoules of energy. Therefore, to feed a malnourished child with 100 gms. of koko to obtain the equivalent energy to be derived from 100 grams of Tom Brown, will require 12 times or 1200 grams of corn dough for the preparation. This quantity sounds absurd and impossible to comprehend for a child to consume.

On the other hand, if rice water is served vis-a-vis Tom Brown, then, about 10 parts of the rice water will be the equivalent of 1 part of Tom Brown in yielding a comparable energy production. Based on this argument we may analyse the energy yielding variations which occur when substitution of food items take place in the course of preparing a meal for a period.

We may also assume that for a particular period maize and yams are short and the shortfall has to be made up with rice in equal quantities. Assuming that 5 kgs of rice is substituted for 5 kgs of banku, a (maize meal) or 5kgs of mashed yam for lunch as shown

below.

TABLE 13 COMPARATIVE FOOD ENERGIES

	CALORIES	KILOJOULES
Banku (5kgs)	4,700	19,700
Rice (5kgs)	5,800	24,300
Mashed Yam (5kgs)	7,250	30,350

It is clear on the above list that rice will provide a higher food energy than banku. On the contrary, if banku is substituted for rice, there is a big loss in food energy to the malnourished children. Mashed yam, a regular diet during the yam season is incidentally, very nutritious providing a much higher food energy than banku and rice.

Appendix 3 is a graphic representation of the food energy to be derived from substituting different diets. We assume that instead of providing 300 grams of rice water, there is a shortage of 200 grams rice which is being made up with 100 gms. of Tom Brown and another 100 grams of koko. While 300 grams of rice water provides 441 kilojoules of food energy, 100 grams each of Tom Brown, Koko and Rice Water altogether provide 1819 kilojoules of food energy, which yields an extra 1378 kilojoules of food energy.

We can therefore draw an inference from the energy yielding capacities of the different food items, and the various diets that,

for a proper substitution of diets due to the frequent shortages of food items to be effective, there is the need to take cognisance of the nutritive value of the various diets fed to the malnourished children, and the energy requirement of the malnourished child.

5.14 CONCLUDING REMARKS ON FOOD SUPPLIES TO THE KITCHEN

It has been demonstrated from the tables that the supply of food items to the PML is very erratic regarding the quantity and the timing, this makes it particularly difficult for adequate projection of future supplies management.

The Nutritionist and the dietitian have their planned projections of the quantity of food items required to provide a well balanced and adequate diet for a specified number of malnourished children based on their conditions in the hospital. However, these projections based on their scientific calculations do not always work out because of the frequent short falls that are encountered. The kitchen at times had to contend itself with the usage of more of one food item at a particular period against another because of unavailability or flexibility in substituting food items during the lean season or periods of shortage. To make this point clear, even though it is specified that fruits, like oranges and bananas have to be served regularly, in practice this is only possible when it is in season, if money was available, or through donations from organisations. There was no data to show any regular supply of fruits except during the latter part of 1991 when the Tender Board

started supplying food items through food contractors.

Several items go into the provision of food for the children in the hospital but, most of these like gas for cooking, utensils, charcoal and a host of others did not have any influence on the health of malnourished children. Thus, they were not taken into consideration. For instance, it did not matter to the health of the children whether gas or charcoal was used to cook their food, or whether new or old utensils were used. What was most important was that, there was never a case which resulted in no food being served either due to a power cut or shortage of food- stuffs. Again the time for serving food was strictly adhered to by the kitchen because that formed part of the therapeutic regimen. In all the children were served six meals a day.

At the time of the data collection, the whole hospital had just been fully renovated, with the kitchen made more spacious and airy. Fuel supply to the kitchen was by direct central gas tank.

Due to the frequent shortages that the kitchen encountered with supplies of regular food items, the Nutritionist had a way of substituting some items to make up for expensive or non available items. It was discovered that when fresh tomatoes were expensive and scarce during the lean season, canned tomatoes were used instead, or tinned fish instead of smoked fish. In fact, the Dietitian and the Nutritionist at times had to rely on their ingenuity to provide food for the children.

5.15 DRUGS

It should also be emphasised that drug supplies to government hospitals are extremely unpredictable, inadequate and sometimes without regard to priority diseases in the hospital. As a result of this unreliable supply system, the hospital has not been able to work out reasonable quantities that it would need. The position of the hospital on drugs is not good and it should be able to determine its own economic order quantity, figure out what quantity of drugs are used and prescribed at a particular period. This notwithstanding, the Pharmacy bases its issues of drugs on demand and availability of prescribed drugs, this practice however, reveals a wide variance between what is needed and what is available. Even though the hospital may be finding it difficult getting drugs from the Regional Medical Stores, the Pharmacist has to endeavour to project the required drugs and the quantities that the hospital will need. It would be improper for the hospital to rely solely on the medical stores when it is aware that conditions are unreliable. The incredibly low quantities of drugs consumed in some months indicate their complete absence from the pharmacy. Notwithstanding this erratic supply, it was realised that during periods in which the hospital had ample supplies, consumption was very high reflecting the general prescribing behaviour of medical personnel.

Table 10 on drug and food bills above indicates an interesting phenomenon between the amount of money spent on food and drugs with

the length of stay. The average length of stay indicates a strong inverse relationship with the average cost per patient. That is, as more money is spent on food and drugs in the hospital, the rate of recovery increases, or at least the length of stay decreases. However, this phenomenon can be questioned on the basis of the corresponding death rates. This is due to the fact that it has been stated earlier that the number of death cases also influence the average length of stay.

For instance, July, August and October were months in which so much was spent on patients, incidentally, the length of stay in these months were the lowest. Table 10 further indicates that deaths in these months were very high which could have influenced the relatively short length of stay.

The lowest cost per month was also recorded in February, which incidentally recorded the highest length of stay of 40.5 days and the lowest death rate. Table 10 which combines drugs and food bills indicate that the length of stay of malnourished children is better influenced through a combination of food and drugs consumed. Thus, there is a synergistic effect on the length of stay when drugs and food are effectively combined in adequate quantities. It could also be that, as malnourished children consume adequate quantities of drugs, their appetites are increased and that hastens their rate of recovery and subsequent shorter length of stay.

The unusually high death rates which occurred in January, July and August might have been due to very bad cases which were admitted to the hospital during the lean season which preceded this period. Other remote explanations could be that, though available figures indicate that so much food and drugs were used, they did not actually get to the malnourished children. For instance pilfering of food and drugs may have caused an unusually high expenditure on these two variables.

The average cost per patient also indicates that lower figures correspond with longer lengths of stay. For example, February has the lowest average cost and a correspondingly longer length of stay. However, December with a higher average cost than March and May has a longer length of stay than these two months. The months of July, August, and October 1991 which had very high average costs per patient ironically had very high death rates which accounts for their lower lengths of stay.

This unusual phenomenon again indicates that money spent on food and drugs alone cannot be used as a yard stick to explain the length of stay of malnourished children. In this regard factors such as the nursing care and attention given to the children by their mothers or caretakers and the medical and nursing personnel are also very important factors to be considered.

For instance it was found out from the interview of some nurses and the dietitian that while the food served in the hospital was intended for the children, some unscrupulous teenage mothers in particular ate the food intended for their babies themselves, under the pretext that the babies did not like the food. Due to this uncaring behaviour of some of the caretakers, their babies eat little or nothing at all. This practice therefore, adversely affect the recovery of the patients. If for some reasons, proper medical care was lacking, or not enough supporting care was obtained from caretakers as it has already been explained, then unfortunately, drugs and food will have very little influence on the health of the malnourished children and on their length of stay.

CHAPTER SIX

6.0 CONCLUSION

Malnutrition continues to be a serious problem in underdeveloped countries, including Ghana. Its consequences are very disastrous and often end up in fatalities.

Generally, malnutrition manifests itself in protein energy or calory deficiency, which results in Kwashiorkor, Marasmus or Marasmic Kwashiorkor. Malnutrition normally affects children who do not get enough protein and calories from the breast-milk or food supplements.

The problem of malnutrition starts when young children are displaced from the breast-milk, either because a younger sibling arrives or that the mother cannot provide enough milk. Other children also suffer from this defect because they lose their mothers altogether, or their bodies cannot absorb enough nutrients. Malnutrition can also be triggered if a child is overwhelmed by infections, or has some congenital defects.

The general poverty that prevails in most developing countries coupled with the seasonal flow of food cause or worsen malnutrition. Other expects have also identified ignorance, illiteracy and neglect of proper child care as secondary causes.

The painful consequences of malnutrition exact their toll on the

development of the brain, whereas deficiency in some micronutrients like vitamin A can cause blindness and death.

At the Princess Marie Louise (PML) Hospital, the bulk of cases reported are Kwashiorkor and Marasmus, though Marasmic Kwashiorkor cannot be discounted.

The major resources used at the PML to treat nutritional deficiencies are food and drugs. Food is the main therapeutic agent, though drugs are heavily relied upon to treat the accompanying complications. Patients who are severely anaemic in addition to being malnourished sometimes have to go through very rigorous treatments like transfusion with blood and intravenous infusions.

Investigations throughout the research revealed that, resource flow in the form of food and drugs are very inadequate and erratic. This irregular supply of basic essentials hamper the smooth work that the hospital staff desire. For most times in the year the ration of food served is small and at times drugs are also in short supply.

Before the Tender Board took over the control of supplying hospitals with food items, the subsidy granted the hospital to feed the children did not permit adequate feeding. However, with the new system that is operating since October, 1991, it is hoped that

the supply of food items would be regular and enough to ensure adequate feeding and also influence quicker recovery of malnourished children.

The work of the PML is very sensitive particularly when one considers the vulnerability of children whose immune systems have been compromised by malnutrition. Such children are easily prone to sudden deaths when immediate therapy is delayed.

It was discovered that, though food and drugs are important in malnourished child care, a whole lot of other factors contribute synergistically to influence the recovery or otherwise of malnourished children. Such factors like the quality of the medical and nursing care are very important even though it is difficult to quantify these variables. It was also discovered that the care mothers or caretakers provide as a supplement to that offered by the staff of the hospital is an important factor which affects child health.

Though the Ministry of Health is operating a cash-and-carry system in administering drugs, it should relax this policy at the PML because it adversely affects the recovery rate of the poor malnourished children whose parents cannot afford to pay for their prescribed drugs. The policy of administering cash for drugs places a lot of strain on the PML because most of its patients are from poor homes

knowing that usually malnutrition is a problem related to poverty, ignorance and illiteracy.

It was also determined from the interview of the staff that most of them felt bored just nursing malnourished children, and that some broader case mix including other general medical cases would introduce some more challenge into their work. It came to light that while the hospital, particularly the medical, nursing and the kitchen staff were working hard to provide the best of services for the malnourished children, some of the mothers, especially, the teenagers, made very little effort to care for their children. While sick children will normally reject food as a result of loss of appetite, such young mothers make no effort to coax their children to eat. This behaviour further exacerbates the conditions of the children and put added strain on the working staff who often have to care for the babies in addition to their heavy work schedules. In fact, some of the mothers do not seem to care for the plight of their children at all, and that becomes a very big burden on the hospital staff.

The utilization potential of the hospital does not seem to be in full operation. Most often there are empty beds found in the wards during the lean season which are awaiting malnourished cases, while the same beds could be utilized to care for other paediatric cases to ease congestions in other hospitals. All that is needed

would be the appointment of a Pediatrician who will support the general Medical Staff of the hospital.

A sad revelation of the study is the occasional high death rates that occur in the hospital. This fact is due to the late presentation of terminal cases which are delayed at home. This problem really demands that effective health education is needed to inform the public about the importance of reporting cases quickly to the hospitals.

Though the Ministry of Health has committed much of its resources to the PML., a lot is still needed to enable the hospital deliver better services to the community.

CHAPTER SEVEN

7.0 RECOMMENDATIONS

The research has been an investigation on the resource flow to the PML which is administered as a government hospital by the Ministry of Health. In order to correct some of the problems of the hospital which in the long run will affect the length of stay of malnourished children and the high mortality, the following recommendations are suggested:

7.1 The PML needs a very special autonomy akin to that of a teaching hospital like Korle Bu, to enable the management of the hospital with its Board take decisions without necessarily waiting for clarifications from the Regional Director's office or the Headquarters, because such decisions like buying drugs need very urgent and swift attention. Furthermore, the composition of the Management Board should also be approved by the Ministry of Health and the Regional Medical Office which will further enable the Board to represent the interest of the policy makers to pave the way for greater autonomy which will ensure efficiency. With regards to the constitution of the Management Board which has to supervise the running of the hospital, it is highly recommended that a responsible authority from the Headquarters or Regiomal Medical Office become a member, thus representing the Ministry of Health to enable the hospital take decisions on its own.

7.2 The PML will need drugs at subsidized prices from the government if it has to work effectively to reduce infant mortality from malnutrition and to be able to reduce the length of stay of malnourished children.

7.3 The Central Medical Stores should also relax its monopoly control of purchasing drugs for hospitals to enable individual hospitals maintain adequate stocks of their own essential drugs through open market purchases without restrictions from the Headquarters of Regional Office. This situation will permit the hospital to carry adequate stocks of its essential drugs to provide the necessary medical care.

7.4 The busy work schedule at the PML demands a permanent Hospital Secretary who will fully man the administrative aspects of the hospital in order that the Senior Medical Officer could concentrate on her medical work fully.

7.5 Sugar and bread should be considered as regular food items and then be awarded to contractors under the Tender Board system to enable the hospital provide these items as a regular diet in the menu of the malnourished children.

7.6 There is also the need for more intensive education in the hospital to help the mothers take better care of their children, especially during feeding times. As a follow up to

improve the maternal and child relationship which is believed would greatly influence the speedy recovery of children, adequate accommodation has to be provided for the caretakers or mothers to enable them reside permanently and comfortably in the hospital while their children are on admission. This will improve the involvement of the caretakers in their children's therapy, and relieve the overburdened staff of their extra non-medical and nursing working load.

7.7 Family Planning education and techniques should be intensified throughout the hospitals catchment area to enable couples space their birth. This education should be linked up with health promotion and a better balance between specific measures for prevention, treatment and rehabilitation. The education of communities should emphasise the detection of growth retardation and other signs of malnutrition from birth.

7.8 There is also the need to intensify the promotion of breast-feeding among different cultures, particularly around the coastal areas where the duration of breast feeding is generally short.

7.9 The food and nutrition outfits of child welfare organisations should intensify the campaign on weaning foods for

individuals and communities to utilize the technique for proper childfeeding.

7.10 There must be effective control of vaccine preventable diseases which also worsen malnutrition through lowering the appetites of children and opening the way for malnutrition to set in.

7.11 As a result of the varying nutritive effects of the different food items and different diets served from the same food item, it would be very important that the dietician calculate the amount of food energy that the children will derive from each meal rather than embarking on simple portion control. This will ensure that the children derive a certain minimum accepted food energy, and not merely eat to fill their bellies.

APPENDIX

The following inpatient statistics on the length of stay are presented. Figures which are underlined indicate durations spent in the hospital on admission before death.

APPENDIX 1

LENGTH OF STAY PER INDIVIDUAL CASES - 1989-1991

JANUARY

Kwashiorkor	5	41	8	11	92	32	75	28	1	9	52
	73	16	49	64	14	5	45	32			
Marasmus	9	31	54								
Marasmic-Kwashiorkor	64										

		Total Days	ALS	Cases	Death
Kwashiorkor	=	652	34	19	5
Marasmus	=	94	31	3	1
Marasmic-Kwashiorkor	=	64	64	1	0
Total	=	810	43	23	6

FEBRUARY

Kwashiorkor	3	42	15	50	13	35	35	23	43	28
	57	49	10	13	30					
Marasmus	36	19	48	22	19	45	13	79	3	30
Marasmic-Kwashiorkor	12									

	Total Days	ALS	Cases	Death

Kwashiorkor	=	446	29	15	2
Marasmus	=	314	31	10	2
Marasmic-Kwashiorkor	=	12	12	1	1
Total		772	24	26	5

MARCH

Kwashiorkor	60	8	42	20	44	40			
Marasmus	12	3	70	80	74	48	50	46	16
Marasmic-Kwashiorkor	31	60	5	20	45	8			

		Total Days	ALS	Cases	Death
Kwashiorkor	=	214	35	6	1
Marasmus	=	399	44	9	3
Marasmic-Kwashiorkor	=	169	28	6	1
Total	=	782	35	21	5

APRIL

Kwashiorkor	1	26	32	1	6	49	41	87	3
Marasmus	17	29	36	33	11				
Marasmic-Kwashiorkor	54	49	37						

		Total Days	ALS	Cases	Death
Kwashiorkor	=	246	27	9	2
Marasmus	=	126	25	5	1
Marasmic-Kwashiorkor	=	140	46	3	-
Total	=	512	30	17	3

MAY

Kwashiorkor	34	6	6	13	4	1	12	76	68	1	1	45
	51	42	51									
Marasmus	12	44	2	30	29	49	45	5				
Marasmic-Kwashiorkor		5	43	4								

		Total Days	ALS	Cases	Death
Kwashiorkor	=	411	27	15	11
Marasmus	=	216	27	8	2
Marasmic-Kwashiorkor	=	52	17	3	2
Total	=	679	26	26	15

JUNE

Kwashiorkor	35	7	5	58	44	15	47	3	27	6	35	37
	37	35	36	44	6	39						
Marasmus	30	30	44	5	14	24						
Marasmic-Kwashiorkor		37										

		Total Days	ALS	Cases	Death
Kwashiorkor	=	516	28	18	4
Marasmus	=	147	24	6	2
Marasmic-Kwashiorkor	=	37	37	1	1
Total	=	700	28	25	7

JULY

Kwashiorkor	12	1	13	1	23	36	46	3	33	45	21
	18	4	16	2	28						
Marasmus	53	1	1	7	2	2	1				
Marasmic-Kwashiorkor	66										

		Total Days	ALS	Cases	Death
Kwashiorkor	=	303	18	16	9
Marasmus	=	67	9	7	6
Marasmic-Kwashiorkor	=	66	66	1	-
Total		435	18	24	15

AUGUST

Kwashiorkor	12	35	11	32	42	4	36	1	4	62	33
	34	45	33	12	1	1	4	62	34	45	
Marasmus	43	39	38	35	56	33	5	31	38		
Marasmic-Kwashiorkor	36	33	34	47							

		Total Days	ALS	Cases	Death
Kwashiorkor	=	513	24	21	8
Marasmus	=	318	35	9	1
Marasmic-Kwashiorkor	=	150	37	4	-
Total	=	981	28	34	9

SEPTEMBER

Kwashiorkor	9	44	45	40	37	14	33	31	4
	28	36	45	43	27	18			
Marasmus	3	107	37						

		Total Days	ALS	Cases	Death
Kwashiorkor	=	454	30	15	3
Marasmus	=	147	49	3	-
Kwashiorkor	=	-	-	-	-
Total	=	601	33	18	3

OCTOBER

Kwashiorkor	7	71	19		
Marasmus	18	7	21	57	

		Total Days	ALS	Cases
Kwashiorkor	=	97	32	3
Marasmus	=	103	25	4
Total	=	200	28	7

NOVEMBER

Kwashiorkor	5	18	44	29	12	28	51	55
Marasmus	37	38						
Marasmic-Kwashiorkor		39	28					

		Total Days	ALS	Cases	Death
Kwashiorkor	=	242	30	8	2
Marasmus	=	75	37	2	-
Marasmic-Kwashiorkor	=	67	33	2	-
Total	=	384	32	12	2

DECEMBER

Kwashiorkor	30	30	5	50	
Marasmus	8	31	15	12	50
Marasmic-Kwashiorkor		24	5	2	

		Total Days	ALS	Cases	Death
Kwashiorkor	=	115	28	4	1
Marasmus	=	116	23	5	2
Marasmic-Kwashiorkor	=	31	10	3	3
Total	=	262	21	12	6

1990

JANUARY

Kwashiorkor	5	5	48	4	3	3
Marasmus	35	65	53	9		
Marasmic Kwashiorkor	69	69	77			

	Total Days	ALS	Cases	Deaths
Kwashiorkor	68	11	6	3
Marasmus	162	40	4	-
Marasmic Kwashiorkor	215	71	3	-
Total	445	34	13	3

FEBRUARY

Kwashiorkor	78	30	23	6	6	12	18
Marasmus	78	19	35	74	70		
Marasmic Kwashiorkor	10	7					

	Total Days	ALS	Cases	Deaths
Kwashiorkor	173	25	7	4
Marasmus	280	56	5	1
Marasmic Kwashiorkor	17	8	2	1
Total	470	33	14	6

MARCH

Kwashiorkor	6	13	2	47	14	20	
Marasmus	54	18	17	45	12	14	7
Marasmic Kwashiorkor	10	7					

	Total Days	ALS	Cases	Deaths
Kwashiorkor	102	17	6	1
Marasmus	167	24	7	1
Marasmic Kwashiorkor	3	3	1	-
	272	19	14	2

APRIL

Kwashiorkor	44	55	40	24	53	29	38	15	
Marasmus	89	28	51	53	44	16	16	12	10
Marasmic Kwashiorkor	29	36							

	Total Days	ALS	Cases	Deaths
Kwashiorkor	298	37	8	1
Marasmus	319	35	9	2
Marasmic Kwashiorkor	65	32.5	2	-
Total	682	36	19	3

MAY

Kwashiorkor	24	65	6	25	24	53	4 4
Marasmus	27	11	7	16			
Marasmic Kwashiorkor	51	17	42				

	Total Days	ALS	Cases	Deaths
Kwashiorkor	205	25	8	2
Marasmus	61	15	4	2
Marasmic Kwashiorkor	110	37	3	-
	376	25	15	4

JUNE

Kwashiorkor	2	30	35	3	19	7
Marasmus	6	35	35	49	7	
Marasmic Kwashiorkor	10					

	Total Days	ALS	Cases	Deaths
Kwashiorkor	96	16	7	1
Marasmus	132	26	5	-
Marasmic Kwashiorkor	10	10	1	1
Total	238	20	13	2

* From July to December,1990 the records on death rates were indicated as follows:

JULY	9
AUG	8
SEPT	8
OCT	13
NOV	9
DEC	14

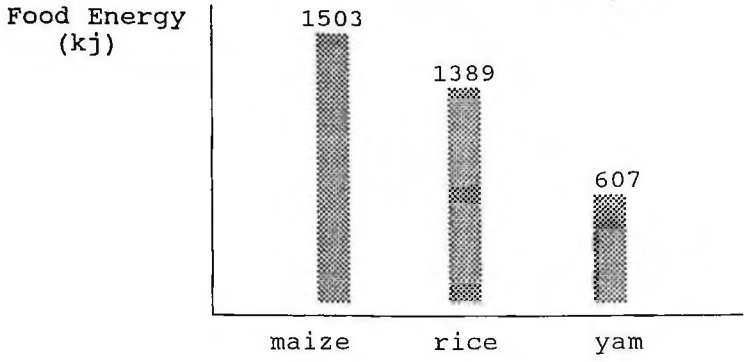
In 1991 the monthly death rates and durations were presented as individual cases as follows:

JAN	4 5 5 6 5 14 75 27 6 18 12 6 26 21 5	(15)
FEB	2 7 3 22 15 12 2 1 1 2 30	(11)
MAR	25 7 21 5 8 7 14 3 1	(9)
APR	No Record Of Deaths	(-)
MAY	3 4 27 1 6 10 - - - - - *	(11)
JUN	12 7 2 4 4 9 21 9 5 3 5	(11)
JUL	15 6 1 11 14 2 6 7 1 12 15 4 18 29 15 8 20 12 8 1 1	(21)
AUG	14 8 2 1 1 6 1 8	(8)
SEP	28 2 6 3 2 5	(6)
OCT	1 1 3 13 4 36 7 9 8	(9)
NOV	1 11 12 26 5 15 14	(7)
DEC	17 6 10	(3)

*- Indicates an unspecified duration of death.

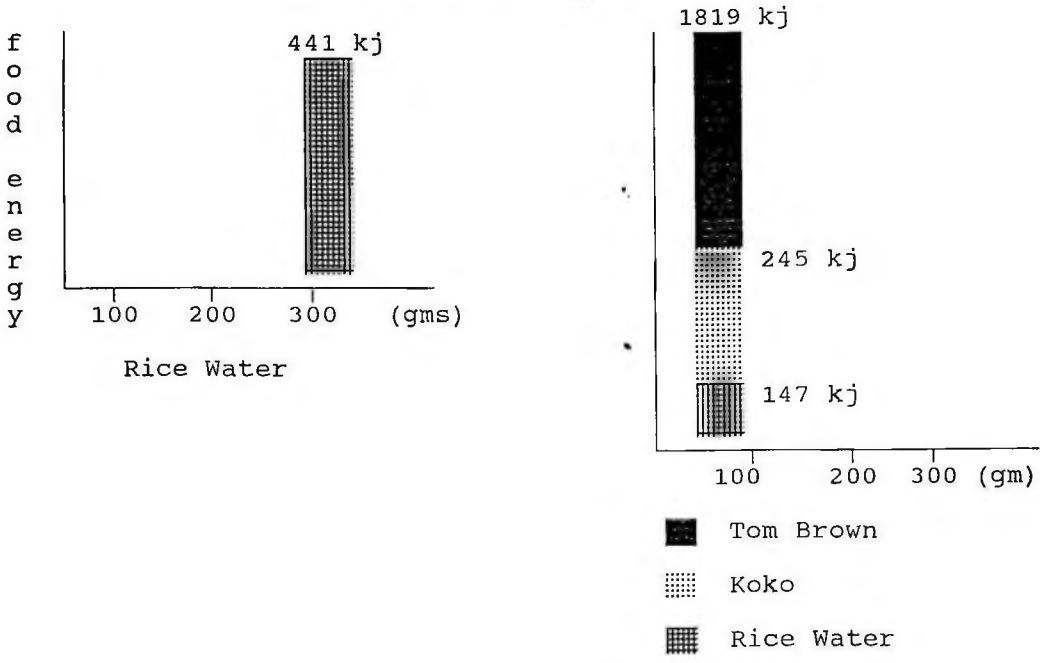
APPENDIX 2

COMPARATIVE FOOD ENERGY



APPENDIX 3

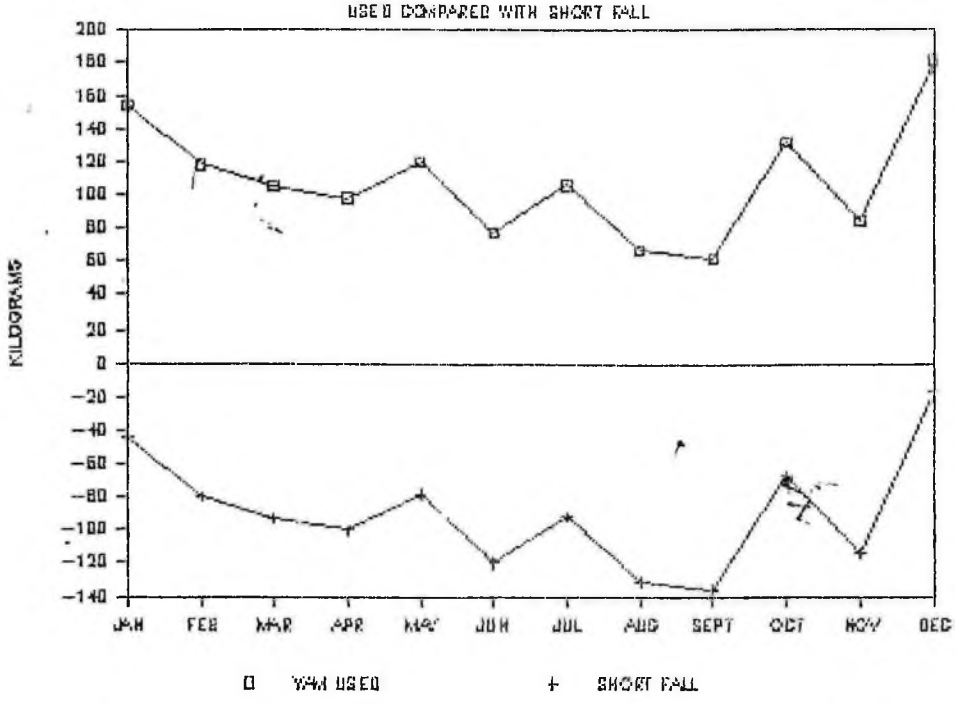
COMPOSITE FOOD ENERGY



APPENDIX 4

YAM USAGE – 1990

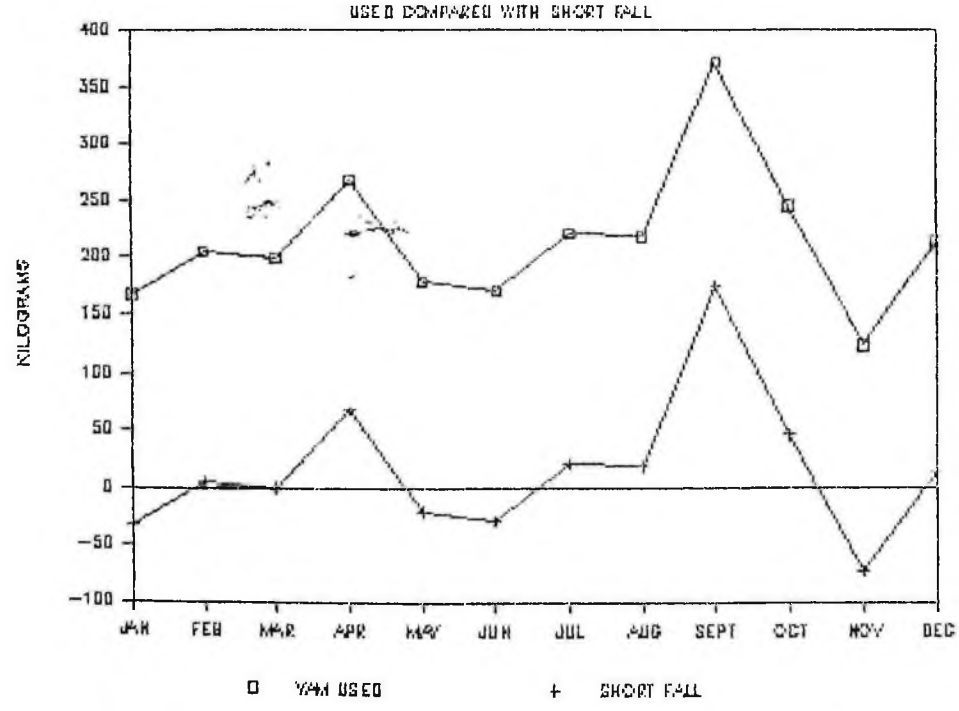
USED COMPARED WITH SHORT FALL



APPENDIX 5

YAM USAGE – 1991

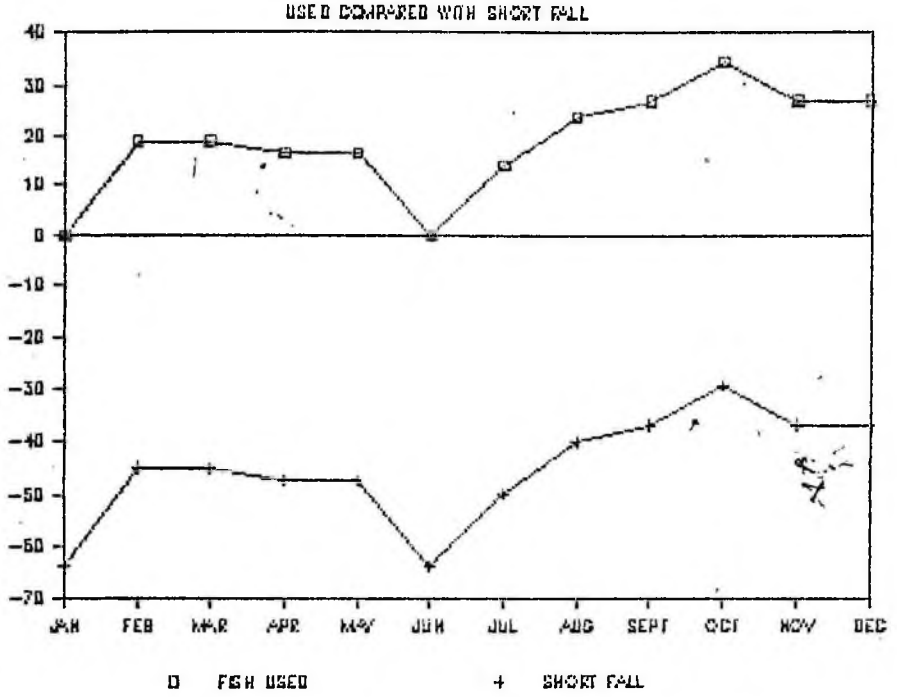
USED COMPARED WITH SHORT FALL



APPENDIX 6

SMOKED FISH USAGE — 1990

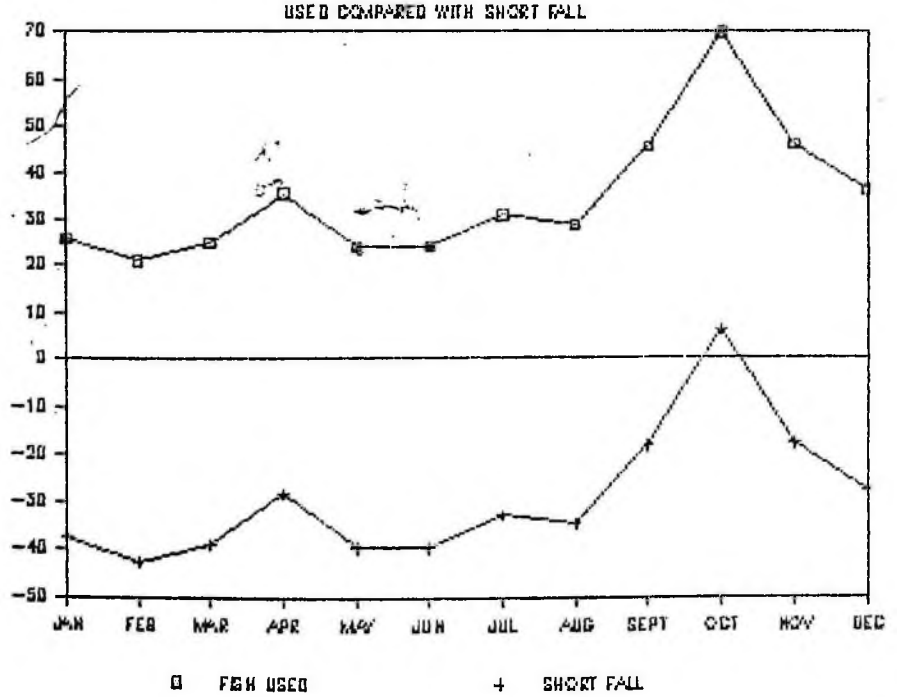
USED COMPARED WITH SHORT FALL



APPENDIX 7

SMOKED FISH USAGE — 1991

USED COMPARED WITH SHORT FALL



QUESTIONNAIRE

PHARMACY DEPARTMENT

1. How would you assess the drug position of the hospital?
2. How do you assess the supply of drugs to the hospital in relation to your needs and requests?
3. What is your impression about the cash-and-carry system of drug administration?
4. How does the cash-and-carry system affect the welfare of patients and their relatives?
5. What is your impression about the adequacy and timeliness of your supplies.
6. To what extent do drugs influence the health of malnourished children.
7. What specific problems do you encounter in the supply of drugs to and from the hospital?
8. What are the procedures involved in purchasing drugs from the Regional Medical Stores and the open market?
9. How do you account for the drugs purchased for the hospital?

QUESTIONNAIRE DESIGNED FOR THE MEDICAL OFFICER IN-CHARGE.

1. How is the hospital managed?
2. How does the Headquarters and the Regional Office influence the management of the hospital?
3. How is the hospital financed?
4. What are the procedures involved in disbursing funds, and what particular problems are encountered?
5. How does the hospital obtain its essential supplies?
6. How do you assess the effect of the cash-and-carry on the following: Drug position, Patient welfare, and Cash position?
7. What is the composition of the Hospital Management Board?
8. What are the functions of the Board?
9. How do you assess the performance of the hospital in its malnutritional care?
10. What do you consider to be the most essential resources of the hospital, and how are these obtained?
11. How would you comment on the adequacy and timeliness of your essential supplies?

QUESTIONNAIRE DESIGNED FOR THE KITCHEN

1. What major diets are provided for the children in this hospital?
2. What specific role does food play in the therapy of malnourished children?
3. Do caretakers at times have to provide food supplements for their children?
4. If so, what particular supplements are provided?
5. Do you provide any supplements when some children do not like the food provided?
6. What are the eating patterns in the hospital with regards to meal times?
7. How do you evaluate the response of the patients in their eating habits?
8. How do you provide meals to cater for the different types of malnourished children?
9. What major food items are used in this hospital?
10. How are these food items obtained?
11. How would you categorise the flow of food items to the hospital? 1. Very Regular 2. Regular 3.Irregular.
12. To what extent do you encounter shortages of essential resources in the hospital?

    1. Very Frequently 2. Frequently. 3. Not Frequently.
13. What do you do when you run out of food items?
14. What procedures are involved in obtaining food items from the open market?

15. How do you consider the procedure involved in this practice?
16. Please rank in order of importance the items used in this department.
17. What do you consider to be the most favourable food with the children?
18. How do you take into consideration the different food energy requirements in your choice of feeding?
19. What is your impression about the administration of the hospital as it influences the kitchen?

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