

PREVALENCE AND MANAGEMENT OF DIARRHOEA IN OUT- PATIENT  
CHILDREN LESS THAN 5YEARS OF AGE AT THE  
PRINCESS MARIE LOUIS HOSPITAL (P.M.L.), ACCRA  
GHANA

by

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## DECLARATION

I hereby declare that this submission is my own work towards the MSc and that, to the best of my knowledge, it contains no material previously published by another person nor materials which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text

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## DEDICATION

Dedicated to the Lord Almighty who has guarded and guided me in all my endeavours even up to this age.

## ABSTRACT

The outpatient department of the Princess Marie Louis Hospital (children's hospital) is in a community at Korle-Wokon; an indigenous settlement in Accra, Ghana. Diarrhoea is a factor to be considered because from the hospitals records it forms 29.94% of out-patients visit to the hospital. The study seeks to find out the prevalence and management of diarrhea for children less than five years and find out the treatment as pertaining to the PML and access or prove otherwise whether the WHO/MOH prescription of using the treatment guidelines is being followed. The study used two weeks with the aim of getting a varied correct representation of the issue from 5<sup>th</sup> January, 2004 to 20<sup>th</sup> January, 2004 to avoid rush periods and occasions like Christmas and other pressures to affect the number of visit leading to more pressure on the prescribers. Data was collected from prescription cards using a questionnaire.

The total number of children under age 5 who visited the hospital for the 14 days were 1186, three hundred and twenty seven (327) were diagnosed with diarrhoea giving a high prevalence of nearly 28 percent. One hundred and forty (43%) were prescribed ORS and two hundred and forty (73 %) were prescribed antibiotics. Antibiotics used includes amoksiklav (amoxicillin plus clavulanic acid), erythromycin syrup, chloramphenicol syrup, syrup co-trimoxazole, crystalline penicillin injection, amoxycillin, tetracycline capsules, cloxacillin syrup and suspension fluclaxacillin, nystatin oral drops, nalidixic acid tablet, metronidazole tablet and syrup, metrolex-F (metronidazole plus flurazolide).

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## CHAPTER ONE

### INTRODUCTION AND LITERATURE REVIEW

#### 1.1 Introduction

Diarrhoea is a common disorder of the gastrointestinal system experienced by most of the population sometime in their lives. Generally it is self limiting and may not require any intervention. Intervention may be considered necessary by patient because of their beliefs and attitude towards normal bowel function (Hogue, 2000). The causes of diarrhoea include various diseases, medications, dietary changes, food or water contamination and psychological distress.

According to Child Health Research Specific Project Report (1998), diarrhoea is one of the top causes of childhood mortality in sub Sahara African and has been estimated to be responsible for 25 to 75% of all childhood illnesses in Africa. In addition, episodes of diarrhoea leads to about 14% of outpatient visits, 16% of hospital admissions and accounts for an average of 35 days of illness per year in children less than five years old. The report also states that unlike the decline in mortality rates, diarrhoea incidence does not appear to have changed substantially over the last decade. A study “Review of Diarrhoeal Disease Cases Admitted to a Busy Referral Hospital in Ghana” (Baffoe-Bonnie et al. 1998) indicated that children less than 5 years of age make up 84% of all child admissions and 56.5% of them being infants below one year.

Diarrhoea is ranked high at Princess Marie Louis Hospital (P.M.L.), being second in prevalence of 5 commonly ranked diseases of occurrence. It is observably a major issue of mortality in children in Korle-Wokon - a visibly poor and crowded community in Accra - and thus a big task for health professionals namely doctors, pharmacists, nurses, and dieticians who are to ensure

total adherence to therapy of patients by monitoring, advising and educating patients about their disease state and medication.

### **1.1.1 Definitions of Diarrhoea**

The Ministry of Health's Standard Treatment Guidelines (2004) defines diarrhoea as passing frequent, loose, watery stools three or more times in a day. Diarrhoea is often accompanied by vomiting. It is very common in children. It has been further described as a condition of abnormal increases in stool weight and liquidity. An increase in stool water excretion above 150 to 200 ml every 24-hour is an objective parameter for acute diarrhoea (Hogue, 2000).

World Health Organization (2000) defines diarrhoea as the passage of 3 or more loose or liquid stools per day, or more frequently than is normal for the individual. It is usually a symptom of gastrointestinal infection, which can be caused by a variety of bacterial, viral and parasitic organisms. Infection is spread through contaminated food or drinking-water, or from person to person as a result of poor hygiene. Severe diarrhoea leads to fluid loss, and may be life-threatening, particularly in young children and people who are malnourished or have impaired immunity.

Gastroenterologist define diarrhoea as the passage of more than 200gm of stool daily and the measurement of stool volume is sometimes helpful in patient evaluation. The most severe symptom in many patients is the urgency of defaecation, and faecal inconsistency is a common event in acute and chronic diarrhoeal illness (Haslett et al.,1999). The bowel frequency of the normal population ranges from three bowel movements per day to one bowel action every third day, and a normal stool consistency ranges from porridge- like to hard and pellet stool.

The term diarrhoea means different things to different people. Many patients and doctors think of diarrhoea in terms of increased stools. Diarrhoea means having frequent stools of more than four in a day sometimes accompanied with pain or cramps, fever and or vomiting with nausea and chills. It could be copious and or sometimes accompanied with a streak of blood and or mucus and a pungent smell for which origin could be a lot of factors including poor sanitation and bacteria or viral infection. It may be severe enough to mimic a case of cholera with voluminous water stools and need proper physical examination since it could be fatal if left untreated or not properly treated. Some mild ones are treated by the first or second day and others may continue for over a week. The symptoms may be as a result from various diseases, medication (especially over the counter (O.T.C.) abuse), dietary changes, food or water contamination and even psychological distress.

### **1.1.2 Etiology and Pathogenesis**

Diarrhoea may be caused primarily by inhibition of ion absorption, stimulation of ion secretion, retention of fluid in the intestinal lumen, and disorders of intestinal motility. The three major aspect of bowel function exist: colonic absorption, colonic motility and defecation reflexes. Retention of fluid in the bowel lumen may be precipitated by food intolerance associated with carbohydrate malabsorption, disaccharid deficiencies, lactulose therapy, poorly absorbable salts (magnesium sulfate, sodium phosphate and citrate, antacids), and ingestion of mannitol and sorbitol. Bacterial and viral infections cause diarrhoea commonly (traveler's diarrhoea). (Hogue, 2000)

Digestion and absorption of nutrients is a complex, highly coordinated and extremely efficient process: normally less than 5% of ingested carbohydrate, fat and protein is excreted in the faeces.

Diarrhoea and weight loss in patients with a normal diet should always lead to the suspicion of malabsorption. (Haslett et al.,1999)

Malabsorption results from abnormalities of the three processes which are essential to normal digestion. First, intraluminal maldigestion occurs when deficiency of bile or pancreatic enzymes results in inadequate solubilisation and hydrolysis of nutrients. Fat and protein malabsorption results. Second, mucosal malabsorption results from small bowel resection or conditions which damage the small intestinal epithelium, thereby diminishing the surface area for absorption and depleting brush border enzyme activity; and finally Postmucosal' lymphatic obstruction prevents the uptake and transport of absorbed lipids into lymphatic vessels. Increased pressure in these vessels results in the leakage into the intestinal lumen, leading to protein-losing enteropathy.

Understanding of these fluid loss aids in comprehending the mechanism of action of antidiarrhoeals. (Haslett et al.,1999)

### **1.1.3 Classification of Diarrhoea**

#### **1.1.3.1 Acute Diarrhoea**

This is extremely common and usually due to faecal-oral transmission of bacterial toxins, viruses, bacteria or protozoan organism. Infective diarrhoea is usually short-lived and patient with a history of diarrhoea lasting more than 10 days rarely have an infective cause (Haslett et al, 1999). They include;

- Traveler's diarrhoea

Travelor's diarrhoea is an attack of usually abrupt and watery stool with abdominal cramps, anorexia and vomiting lasting for 2-5 days. **It commonly affects travelers; especially those visiting developing countries. However, in 60 – 70% of patients so affected no organism is identified on examination.**

- Infectious diarrhoea-

Infectious diarrhoea- These are normally of specific causes example Dysentery, Cholera, Typhoid

- Drug induced diarrhoea- NSAIDs, anti biotic, cytotoxic drugs

### **1.1.3.2 Chronic or Relapsing Diarrhoea**

The most common cause is irritable bowel syndrome which can present with increased frequency of defaecation and loose, watery or pellety stool. Diarrhoea rarely occurs at night and is most severe before and after break fast. The stool often contains mucus but never blood, and 24- hour stool volume is less than 200g. Chronic diarrhoea can be categorized as disease of the colon or small bowel, or malabsorption (Haslett et al, 1999).

### **1.1.4 Epidemiology of Diarrhoea**

Diarrhoeal diseases remain the major cause of childhood morbidity and mortality in developing countries, especially in African countries. According to W.H.O. (1996) report, diarrhoeal diseases are still leading causes of mortality and morbidity in children under five years of age. This report further indicates that each child in the Africa region has five episodes of diarrhoea per year and 800,000 children die each year from diarrhoea and dehydration. Diarrhoea which is characterized by an increase in water evacuations or some watery evacuation with blood or

mucus relative to the usual pattern of each individual (Teran, 1991), has been found to be a major contributor to illness and death, particularly among children in sub-Saharan Africa (Kirkwood, 1991).

An estimated 1,000 million episodes occur each year in children under 5 years of age in Africa. Diarrhoea causes an estimated 5 million deaths in children less than 5 years of age per year. (Carlos et al., 1990) About 80% of these deaths occur in children in the first 2 years of life. Approximately one third of deaths among children less than 5 are caused by diarrhoea (Snyder and Merson, 1982). Most diarrhoeal illnesses are acute, usually lasting not more than 3-5 days and are secondary to infectious causes-bacterial, viral, and parasitic. Infectious agents that cause diarrhoeal diseases are usually spread by the faecal-oral route, specifically by ingestion of contaminated food or water and contact with contaminated hands. W.H.O. (2006) worldwide report also confirms that acute diarrhoea incidence is 5 percent to 7 percent annually; and at least 5 million deaths per annum is reported in children less 5 years. In Africa acute diarrhoea is a leading cause of death among children.

In Ghana, the risk of having diarrhoea was found to be significantly associated with toilet facility, where children living in houses with toilet facilities are about 50% less likely to contract diarrhoea than children living in houses with no such facilities (Tagoe, 1995). Furthermore, the prevalence of diarrhoea was significantly lower among children of educated mothers than children of uneducated mothers. This therefore indicates that education of mothers is essential in the prevention of diarrhoea in children. This is probably because education provides mothers the knowledge of the rules of hygiene, feeding and weaning practices, the interpretation of symptoms enhances timely action to childhood illness. A comparative study of urban areas of Ghana, Egypt, Brazil and Thailand (Timaeus and Lush, 1995) clearly indicates that a child's

health is affected by environmental conditions and economic status of the household. According to these authors, children from better-off households have lower diarrhoeal morbidity and mortality in Egypt, Thailand, and Brazil. Such differentials in diarrhoeal diseases by households, economic status is probably due to differences in child care practices, for instance preparation of weaning foods and personal hygiene (Timaeus and Lush, 1995).

Noticeably, in Ghana, the incidence of diarrhoea obtained from hospitals represent only a small proportion of all illnesses probably because many cases do not seek medical attention or patronize community pharmacy service but may be drawn to the common use of herbs and other belief practices.

Ministry of Health (M.O.H.) standard treatment guidelines 2004, state diarrhoea as a disease very common in children in Ghana, the commonest cause in this age group is viral and there is therefore usually no need to prescribe antibiotics. Fluid loss occurs quickly in children because of their size and if this is not corrected it may result in dehydration which could be fatal. It also states that in children other diseases like malaria, pneumonia, ear infections urinary tract infections may cause diarrhoea; hence there is the need to examine the child fully to make sure there is no obvious cause for diarrhoea and that there is usually a fever if there is another cause.

In Ghana diarrhoeal cases as reported by Korle Bu Teaching Hospital (KBTH) Polyclinic, 2004 stood at 4,624 and between November 2005 and January 2006, 243 children with acute diarrhoea were consecutively enrolled for examination at the Bulpeila Health Centre, a study site of the Institute of Tropical Medicine Berlin.

PML first three quarters January to September, 2004 report have a prevalence of disease pattern for children under five graduated chronologically as follows; Malaria, Diarrhoea, Skin Disease,

Acute Respiratory Infection, Urinary Tract Infection, Pneumonia, Anaemia in order of common occurrence. Diarrhoea is also ranked second to 4 top most diseases seen at the Out Patient Department (OPD) in the first half of the years 2002, 2003, and 2004. Out of the five top most diseases, diarrhoeal and its associated diseases rank top most high in fatality and gave percentage of admissions as 12%, 14% and 11% in 2002, 2003 and 2004 respectively, diarrhoea ranking second in 10 top most causes of admission with malaria first and pneumonia 3<sup>rd</sup> in cases seen at OPD from 2002-2004.

#### **1.1.5. Risk Factors of Diarrhoea**

The prevailing environmental condition and logistics available in the setting; educational level of parents and or care takers are major factors to be considered. Complains of diarrhoea should not be taken lightly. A whole lot of factors can cause diarrhoea especially in children. Cause could be bacterial, viral, etc, and since fluid loss occurs quickly in children this could be fatal.

##### **1.1.5.1 Contaminated Food / Water**

Breast-feeding, especially if this is the only source of nutrition, has been shown to protect children against the development of diarrhoea in Africa (Huttly et al., 1987; Mock et al., 1995; Scott-Emuakpor, 1986) as elsewhere in the developing world. In contrast, foods given for complementary feeding probably contribute to diarrhoea in infants. (Barrell et el., 1979). One should not lose sight of contamination as a main cause of diarrhoea.

##### **1.1.5.2 Early Introduction of Milk Formula or Solid food**

The early introduction of milk-formula or solid food is often considered to increase exposure to enteropathogens and has been associated with increased rates of acute diarrhoea. Studies in The



Gambia in the 1970s demonstrated heavy contamination of gruels used as complementary foods in breast-fed infants (Barrell et al., 1979). Millet flour, cooking water, empty serving bowls, and even simmering gruel were all found to be contaminated with *E. coli*; colony counts of this and other organisms increased steadily with storage at room temperature (Rowland et al. 1978).

### **1.1.5.3 Personal Hygiene**

Methods of food handling and storage, source, and use of safe water, and personal hygiene all contribute to the potential risk of developing acute diarrhoea. Ponds, rivers, standing waters and unprotected springs tend to be more heavily contaminated than protected spring source of drinking water and have been significantly associated with an increased risk of diarrhoea in a number of studies.

Two more studies have found an increased risk of diarrhoea associated with the consumption of maize-based weaning foods. However, in one of these studies, this association was only significant in children living in rural communities. (Ekanem et al, 1991).

There is an increased risk of diarrhoea in households lacking the habit of frequently washing hands with soap. Storage of food in proximity to household defaecation sites was evaluated in one study in Nigeria and found to be significantly associated with acute diarrhoea.

Playing in the soil is a major risk factor, hence mothers can limit contamination from soil particles and pathogens during sitting, crawling periods etc by providing children with walking chairs and seeing personally to and taking interest in their food preparation and personal hygiene.

#### **1.1.5.4 Lack of Maternal Education and Care**

There is a trend toward lower maternal educational status among cases which shows that maternal ignorance of proper caretaker hygiene were significantly associated with diarrhoeal diseases and also showed that households having inferior hygiene practices including improper disposal of children's faeces, absence of toilet paper, solid or liquid waste disposal within the living compound **constitute** major risk factors. Habitual teaching of washing hands with soap, and using running waters are ideal.

Weaker association with diarrhoea includes presence of flies in the latrine area and visible stool around the latrines. Logistic regression demonstrated that the use of improper means of faecal and solid waste disposal and improper refuse disposal was also found to be associated with an increased prevalence of diarrhoea in The Congo and Nigeria. **(Child Health Research Special Report, 1998)**

#### **1.1.5.5 Diseases**

Metabolic diseases like hyperthyroidism, diabetes mellitus and pancreatic insufficiency are risk factors for acute diarrhoea. Similarly, surgery procedures like colonostomy, gastrectomy, vagotomy, renal failure, anaemia and gall bladder removal and cancer of the colon are same.

Few studies have evaluated the roles of socioeconomic and behavioural factors in the development of persistent diarrhoea in Sub-Saharan Africa. The study did show a strong effect of underlying HIV infection on the risk of developing persistent diarrhoea. (Thea et al, 1993)

In children other diseases like malaria, pneumonia, ear infections, urinary infections, may cause diarrhoea. The Ministry of Health (M.O.H.) standard treatment guidelines 2004, ask the child to

be fully examined to make sure there is no obvious cause for the diarrhoea because there is usually fever if there is another cause. Giving antibiotics may cause or prolong diarrhoea. The commonest cause of diarrhoea in children is viral and there is usually no need to prescribe antibiotics.

#### **1.1.5.6 Malnutrition**

Malnutrition causes diarrhoea which in turn also causes malnutrition, setting up a vicious cycle. Although no study has systematically evaluated the interaction between malnutrition and persistent diarrhoea, at least one report found a longer duration of diarrhoea in malnourished children (Tomkins, 1981). Deficits in nutritional status appear to contribute to an increased incidence of persistent diarrhoea in other regions of the developing world as well. (Goodgame, 1975).

#### **1.1.6 Clinical Findings and Manifestation**

A careful history and physical examination are essential for the diagnosis of diarrhoea. Ascertaining from the patient the duration of diarrhoea, the description of the stool (consistency, colour, odour, presence or absence of melanic stool), the frequency of bowel movements, associated symptoms, and any underlying disorder is essential to a thorough history. Distinguishing between large-stool and small-stool diarrhoea helps determine whether the underlying disorder originates from the small bowel or proximal colon and rectum, respectively (Hogue, 2000).

The MOH standard treatment guidelines 2004 suggest the following features to watch out for; blood or mucus in the stool, presence of fever, urine output plus colour of urine, presence of vomiting, and the duration of illness.

- If patient has diarrhoea plus vomiting plus no mucus plus low grade fever think viral infection.
- If patient has diarrhoea (very watery) plus vomiting plus cramps plus blood plus mucus plus fever think of bacterial infection
- If patient has diarrhoea plus blood plus no fever think of amoebiasis, if profuse diarrhoea (rice water stool) plus vomiting think of cholera
- If patient has diarrhoea plus excessive vomiting (in no more than one member of household or group) think of food poisoning.

Several signs and symptoms of diarrhoea have been noted and suggest underlying disease states. Generally, the passage of blood may indicate inflammatory, infectious, or neoplastic diseases. Inflammation or infection may be detected by pus or exudates in the stool. Infection caused by shigella has characteristic blood-tinged mucus without an odor. Salmonella infections and E coli infections of infants are usually characterized by green “soupy” stools. Passage of non-bloody mucus often suggests irritable bowel syndrome, particularly when it is associated with intermittent diarrhoea and constipation. Foecal incontinence and nocturnal diarrhoea are associated with rectal sphincter dysfunctions secondary to neurologic problems. Less specific signs of diarrhoea associated with a patient’s desire to lose weight may suggest laxative abuse (Hogue, 2000).

Table 1.1 can be used to assess the degree of dehydration in children with diarrhoea. The M.O.H. standard treatment guidelines state other signs to be looked for in adult and children above five years of age.

Table 1.1; Degree of dehydration

1.LOOK AT Condition	<u>Lethargic or unconscious : floppy</u> (SEVERE DEHYDRATION)	<u>Restless, irritable</u> (MILD DEHYDRATION)	<u>Well, alert</u> (NO DEHYDRATION)
1.Eyes	Very sunken and dry	Sunken	Normal
Tears	Absent	Absent	Present
Mouth and tongue	Very dry	Dry	Moist
Thirst	Poor/not able to drink	Thirsty, drinks eagerly	Drinks normally not thirsty
2.FEEL Skin pinch	Goes back very slowly	Goes back slowly	Goes back quickly
3. Decide	2/> signs (severe Dehydration) + 1 underlined pt	2/> signs (some Dehydration) + 1 underlined pt	Patient has no sign of dehydration
4. Treatment plan	Plan C	Plan B	Plan A
4. Dehydration	> 10%	5-10%	< 5%

Source; M.O.H. Standard Treatment Guidelines, 2004.

Refer appendix 1 for treatment plan.

Although diarrhoea may be uncomplicated and self-limiting as complaint of most people is of short duration, persistent diarrhoea may have serious consequences. Excessive fluid loss leading to dehydration may be caused by enterotoxins . Sodium and water deficits secondary to fluid loss are common in persistent diarrhoea. Potassium losses of approximately 6-7mEq/kg may be observed in untreated patient at risk of developing paralytic ileus and cardiac arrhythmias if potassium is not appropriately replaced. Foecal loss of bicarbonate and impaired renal excretion of acids may subsequently cause a metabolic acidosis. Other complications like infantile

gastroenteritis are commonly caused by rotavirus which has been found to cause mortality in children.

### **1.1.7 Management of Diarrhoeal Diseases**

The treatment of diarrhoea remains empirical and depends on the clinical status of the patient. Certain manifestations and complications must be identified in **order** to determine the goals of therapy. Treatment is directed at terminating an acute attack and inducing remission, preventing relapse and controlling chronic symptoms. The approach to management should be individualized and includes general supportive measures, drug treatment against the disease process itself where necessary, management of the patient nutritional status and advice of hygiene if necessary.

Treatment should not be so aggressive as to complicate a situation that may already be life threatening. It must be given at a rate that will avoid complications. Oral rehydration salts (ORS) and oral rehydration therapy (ORT), adopted by UNICEF and WHO in the late 1970s, have been successful in helping manage diarrhoea among children. It is estimated that in the 1990s, more than 1 million deaths related to diarrhoea may have been prevented each year, largely attributable to the promotion and use of these therapies. These may have been informed by the fact that dehydration is suggested by example weight loss and reduced tissue turgor, sodium depletion suggested by thirst and hypotension, potassium depletion suggested by muscle weakness, alkalosis, which can occur as a result of a loss of hydrogen ions and that normal serum electrolyte levels do not always reflect normal body water or pH status.

Today, however, there are indications that in some countries knowledge and use of appropriate home therapies to successfully manage diarrhoea, including ORT, may be declining.

Though the mortality for children less than five years suffering from acute diarrhoea has fallen from 4.5 million deaths annually in 1979 to 1.6 million deaths in 2002, acute diarrhoea continues to exact a high toll on children in developing countries. (The United Nations Children's Fund/World Health Organization, 2004)

Table 1.2; FDA-recommended OTC antidiarrhoeals

Medication	Dose	Maximum dose per day
Loperamide	>12 yrs: 4 mg at onset, then 2 mg after each loose stool	8 mg; 16 mg <sup>a</sup>
	9-11 yrs: 2 mg at onset, then 1 mg after each loose stool	6 mg
	6-8 yrs: same as above	
	<sup>a</sup> < 6 yrs: 1 mg at onset, then 1 mg after each loose stool	4 mg 3 mg

<sup>a</sup> Receive only under medical supervision.

Source: Valerie Hogue, Diarrhoea and constipation

The management of acute, non specific diarrhoea consists of adequate oral rehydration and relief of symptoms. Several non prescription agents are effective in managing the associated symptoms of diarrhoea (Hogue, 2000). Table 1.2 outlines the FDA recommended over the counter anti diarrhoeals. In acute state, non specific diarrhoea in adults are generally not severe and require only simple replacement of fluid and electrolytes lost in the stool. Patients should be advised to ingest 2 to 3 litres of clear liquids (example, ginger ale, decaffeinated cola, tea, broth, or gelatin) within the first 24 hours; the following 24 hour diet should consist of bland foods including rice,

soup, bread, salted crackers, cooked cereals, baked potatoes, applesauce. A regular diet should be resumed after 2 to 3 days. Support of intravascular volume with fluid therapy is essential to maintain adequate blood pressure and renal perfusion.

According to the Ministry of Health Standard Treatment Guidelines (2004) therapeutic objectives, the aim of treatment is to prevent dehydration, replace fluid, maintain nutrition, and maintain personal hygiene and using Oral Rehydration Salt (ORS) in different doses. ORS is Oral Rehydration Salts which contains basically **sodium, potassium and glucose**. Glucose enhances intestinal absorption of sodium and potassium.

The different doses of ORS for fluid replacement are given for cases of no dehydration, mild dehydration and severe dehydration. Home made ORS should include one level teaspoon of salt, eight level teaspoons of sugar, one litre of clean drinking or boiled water and then cooled, 5 cupfuls (each cup about 200 ml.).

For **no dehydration** a child can be treated safely at home by instructing mothers to give home-based fluids like rice water, koko (porridge), soup, clean water and ORS. Breastfed babies should be given breast milk and as much ORS or fluid as the child can take.

For **mild dehydration** the child should be treated in the clinic. Give ORS in the first 4 hours. If child vomits, wait for 10 minutes and start again. Check out for signs of worsening dehydration or improvement and manage appropriately after the 4 hours.

**Severe dehydration** requires treatment with IV fluids in hospital. **Patients should be given a** 100ml/kg Ringers Lactate (R/L), Normal Saline (N/S), Cholera replacement fluid. If dehydration is extremely severe or if patient is vomiting everything given, then IV fluids- Ringer's Lactate



solution of composition;  $\text{Na}^+$  130.5 mEq/litre,  $\text{K}^+$  5.4 mEq/litre,  $\text{Ca}^{2+}$  3.6 mEq/litre,  $\text{Cl}^-$  111.3mEq/litre, Lactate 28.2 mEq/litre is given. Ringer-lactate solution closely resembles that of plasma because of its moderate amounts of  $\text{K}^+$  and  $\text{HCO}_3^-$  (**bicarbonate**) in addition to  $\text{Na}^+$  and  $\text{Cl}^-$ . However it is to be used with caution in patients suffering from cardiac, renal or hepatic conditions and must be started before giving ORS. If there is acidosis and hypokalaemia then potassium chloride could also be given.

Adults must also continue to drink ORS and other home based fluids. Where stool culture and sample for routine examination has been made, specified doses for the following are given appropriately.

For bacteria diarrhoea use oral Co – trimoxazole. Adults: 960mg 12 every hours for 7 days; children: 6 months-6 years, 240mg every 12 hours for 7days; 6 years – 12 years, 480mg every 12 hours for 7 days.

For **amoebiasis and giardiasis** use oral metronidazole. Adult: 800mg three times a day for 5 days; children: 8- 12 years, 400mg three times a day for 5 days; 4-7 years, 200mg three times a day for 5 days; 0-3 years, 7.5mg/kg three times a day for 5 days.

For **rice-water stools** (cholera) start IV fluid with cholera replacement fluid or Ringer's Lactate immediately, if possible. If not possible refer for IV therapy. Continue with ORS if tolerated. Also start oral Tetracycline - Adults: 500mg four times daily for three days; children: 12.5 mg/kg four times daily for 3 days.

Anti diarrhoeal agents (medication used to stop diarrhoea) example Lomotil, codeine, kaolin, phthalylsulphathalazole, loperamide (imodium) and antibiotic-containing kaolin or pectin

preparations are of no therapeutic value in diarrhoea and are normally not recommended for use in children as they may occasionally cause toxic dilatation of the bowel. Diarrhoea treatment is normally specific and patients are to be sure of medications being used for treatment. Safety and efficacy is paramount. **For example,** treatment with ORS must be followed to the latter depending on the type and degree of diarrhoea experienced and examined and equaled to volumes of ORS taken as this differs with the type.

Loperamide 4mg has been cited to stop travelers diarrhoea if prolong or very severe. It must also be noted that most disorder for traveler's diarrhoea (TD) usually resolves spontaneously and have no need for anti diarrhoeal agents.

Antibiotics are not necessary for mild attacks especially as they may induce antibiotic resistance. Antibacterial drugs are generally unnecessary in acute diarrhoea e.g. in simple gastroenteritis. Severe attack can be aborted in most cases with 2 doses of 500mg of ciprofloxacin 12-hours apart.

Various medications, both prescription and over the counter (OTC) are available for the symptomatic relieve of diarrhoea. Where there is the need FDA categorization of OTC anti diarrhoeals must be recognized. Generally safety, effectiveness, resistance and misbrandedness must also be recognized since some may stand out with insufficient data on them and need further investigation. Eg Aluminium hydroxide, Atropine and Hyocyanine sulphate and calcium carbonate.

Opium products must be in combination with other anti diarrhoeal agents in order to be marketed as OTC with specific effective doses (Hogue, 2000).

Although infectious diarrhoea may be treated with antimicrobial therapy, the use of these agents is controversial. Generally, acute diarrhoea is self-limiting and only requires symptomatic relief and fluid replacement. Antimicrobial therapy is indicated in severe cases persisting for more than 48 hours, passing six or more stools in 24 hours, and / or associated with fever, blood or pus in the stools (Hogue, 2000).

### **1.1.8 Prevention of Diarrhoea**

Diarrhoeal disease control programs have helped most countries. These have largely employed a W.H.O.-endorsed case-management strategy which emphasizes Oral Rehydration Therapy (ORT), probably the easiest intervention to implement. Additional measures including improved nutrition with a focus on breast-feeding and safe weaning foods, better personal and domestic hygiene, and the provision of safe water supplies are being gradually introduced. Travelers' should be advised to avoid drinking or brushing their teeth with tap water; using ice cubes probably made with contaminated water and using non boiled water for food preparation to avoid diarrhoea especially travelers diarrhoea. Food that should be avoided are under cooked raw food, salads and unpasteurized milk and milk products. Method of purification including vigorous boiling of water and chemical disinfection with tincture of iodine are sometimes employed. Foods safe for consumption include bread and crackers, peeled fruits or vegetables, and well- cooked food.

Community intervention programmes should be put in place to train health workers to provide health education to mothers during home visits especially specifying programmes for good water supply use, improvement in health and stressing on other public education. The Imo State Drinking Water Supply and Sanitation Project in Nigeria, a collaborative effort involving several state governments with UNICEF assistance, evaluated the effects of improved water source

(boreholes with hand pumps), ventilated improved pit latrines, and supportive hygiene and health education on the prevalence of diarrhoea and malnutrition (Huttly et al, 1990). These interventions did not appear to have an impact on diarrhoeal prevalence but did lead to a progressive decline in the proportion of children aged less than three years with weight-for-height below the 80% reference value. A case-control approach was used to study the effect of improved water and sanitation facilities on diarrhoeal morbidity in Malawi (Briscoe et al, 1988). The risk of attending a clinic because of acute diarrhoea was reduced by 20% in children with access to improved sanitation and water supplies. This effect was not statistically significant, perhaps because of the small study sample size. However, a similar estimate of the reduction in diarrhoeal morbidity (22%) was obtained from a review of worldwide studies of the impact of sanitation (Esrey, et al, 1991) These findings are moderately encouraging; however, assessing the effect of sanitary, water, and public health education interventions on morbidity and mortality from diarrhoeal diseases remains a challenge for investigation.

Mass communication techniques which incorporate local perceptions of diarrhoeal disease management, together with increased availability of ORS salts and educational efforts to teach proper ORS preparation and use, can stimulate increased use of ORT

### **1.1.9 Compliance to Diarrhoea Treatment**

Most mothers refuse to follow laid down rules for feeding and use of medication. Ignorance and a lackadaisical attitude are major factors. Most children are left unattended to by both parents and are left with untrained hands. (**Child Health Research Special Report,1998**)

Compliance has been defined in many different ways mostly reflecting the views of authors (Cramer et al 1991) in the medical context as following the instructions of the healthcare

provider. The Cambridge advanced learner's dictionary defines compliance as "when people obey an order, set of rules or request."

In Ghana the job of inspectors to enforce compliance with the regulation is lacking. Continuous effort is needed to encourage lifestyle changes and improve medication compliance. Failure to follow prescribed medication pattern, and instruction for use of medication and use of un prescribed medication compounds diarrhoea: Therefore the patient the medication and the health professional all play a major role in controlling this disease.

Doctors, pharmacists, dieticians, and nurses have great influence on their patients compliance with medicines, since they are directly involved in patient care. They write prescriptions, supply, counsel patients and supervise the use of medicines. Patients have confidence in these professionals and hence any dissatisfaction with a health professional's attitude, communication or perceived skills may lead to a patient non-compliance with prescribed drugs (Lasagne & Hutt, 1991).

Co-ordination and co-operation among members of the health team are necessary in ensuring that uniform instructions are given to patients on their medicines to enhance compliance (Tweedie, 1999)

Hayne et al (1987) indicated that professional unawareness of basic compliance management principles is a key reason why compliance has not advanced. Inadequate training in communication, interpersonal skills, behaviour change and lack of adequate time for effective counselling accounts for these shortfalls (Ayeh, 2000). Several important areas must be considered in attempting to overcome non-compliance. Below are some recommended steps to improve patient compliance:

- Education about the consequences of untreated diarrhoea and the role of drug and non-drug treatments serves as a foundation for compliance (i.e. communication and teaching).
- The patient must understand and believe that diarrhoea is a serious condition that may need attention.
- Simplification of the prescription can improve compliance.
- Avoid side effects by starting with low doses and individually selected drugs.
- Schedule drug doses once or twice daily
- Label prescriptions with clear, explicit directions, and indicate the purpose of the medication.
- Tailor medication times to coincide with existing daily habits.
- Discuss potential problems such as drugs costs, confusion with other and previous problems with drug therapy and provide written schedule where necessary.
- Encourage or reward patients for providing feedbacks, keeping appointments, taking medications, and keeping to personal hygiene establishing positive relationship to reduce referrals.

#### **1.1.10 Healthcare in Ghana**

Ghana is a country located on the Gulf of Guinea, only a few degrees north of the Equator, therefore giving it a warm climate. It borders Côte d'Ivoire (Ivory Coast) to the west, Burkina

Faso to the north, Togo to the east, and the Gulf of Guinea to the south. Total population, 2003 figure was 20.7 million.

According to the UNICEF report 2002, primary school enrolment (% gross) stood at 78.7percent and Adult literacy rate (% age 15 and above) was 73.8 percent. The domestic economy continues to revolve around subsistence agriculture, which accounts for 50% of GDP and employs 85% of the work force, mainly small landholders. The ratio of the Poor as % of total rural population is 49.9% (ghanatoday.com) Most Ghanaians engage in petty trading.

The crude birth rate is 30.9 per thousand people (2003) and crude death rate per thousand people is 12.8 with infant mortality rate per thousand live births at 59 and under 5 mortality rate 95 per thousand children (World Bank,, 2005)

As recorded by UNICEF data base on diarrhoea diseases and oral rehydration therapy percentage for children under-fives with diarrhoea receiving oral rehydration and continued feeding (2000-2006) was 29% for Ghana (MICS 2006, UNICEF HQ, 2007)as compared to 22% for Togo, 45% for Côte d'Ivoire and nil for Latin America and Caribbean, CEE/CIS, and Industrialized countries.

Diarrhoea has remained and persistently been the causes of death in children under-5 in Ghana. The PML hospital first three quarters report, 2004 state that diarrhoea occupies the second position in the 10 top most disease causes of admissions at the hospital. Malaria ranked first and pneumonia third. Case fatality stood at 4.7 percent with the reverse happening diarrhoea rather overturning malaria in terms of death. (Refer Appendix 4.C)

Lower maternal education, poor sanitation, lack of good hygienic practices, lack of training, unemployment, and poverty, may have contributed to the high prevalence for diarrhoea and its complications. The Government of Ghana has started operating a national health insurance scheme to reduce the cost of medical care in the country.

#### **1.1.11 Background and Setting**

The research was carried out in P.M.L. **from** 5<sup>th</sup> January, 2004 to 20<sup>th</sup> January, 2004 to avoid rush periods and occasions like Christmas and other pressures affecting the number of visit leading to more pressure on the prescribers. The study used duration of two weeks with the aim of getting a varied correct representation of the issue. The community is Korle-Wokon, an indigenous Accra settlement with a not so good environment, poor, and highly populated.

Princess Marie Louis Hospital where the research took place was formally a kwashiorkor (malnutrition disease) outfit in the 50's which was transformed into a children's hospital and currently caters for all diseases even in adults. There is also now a malnutrition and diet centre attached. The set up includes; a recovery ward, an Out Patient Department where patients are sorted out for attention, four in-patient wards with a 25 bed capacity each, and emergency detained wards (30 beds), a dispensary and a laboratory and a records and administrative unit, an injection room, a catering unit, kitchen, public health unit, a recreational area for children and a mortuary.

At the time of the research the staff of interest population was 6 doctors (2- specialist, 4-senior medical officers (SMO), 1- medical officer (MO), and 1-MO contract), 5 medical assistants (1-principal medical assistant, 1-senior medical assistant, 2-grade one medical assistant, one -grade



II medical assistant), 2 pharmacists with attendants, and 53 nurses and 13 reproductive and child health officers.

PML has as its aim to promote and maintain the optimal growth and development in children; and a vision to offer a specialized hospital, offering integrated services in the management of childhood illness by the year 2010.

Patients are normally seen on daily bases by each of the health officers in their consulting rooms (2 MO/room). Patient are sorted out either by appointment, referral or as an emergency. Each patient spends an average of 5 minutes. Normal attendant time ends by 1pm where medical officers get ready to attend to other duties to give way to a less busy afternoon and a night shift. All medical cases referred from regional hospitals and other smaller hospitals nation wide are seen daily.

All the consulting rooms have nurses attached to them and a principal nursing officer manages them. All patients seen at the outpatient clinic requiring prescribed medication visit the pharmacy department for their prescribed medicines before going home. Doctors consult daily and give appointments for referrals. Nurses check blood pressure and pulse of patients before they see the doctors. Again a nurse gives advice and directs patients before and after the consultations. Patients leave prescription rooms with prescription forms. Each patient has an attendant card, in which all medical notes and laboratory reports are kept and these are revised with each visit. The cards are kept in the records department and patients have to retrieve them on the day of appointment. Information on patient gathered from the cards issued is recorded in record books on daily basis.

## **1.2 Research Problem**

Healthcare professionals, especially Medical doctors are so few as compared to the number of patients who attend outpatients' clinics, such that they are unable to spend much time in listening to and on examination of patient and follow up research into the disease state. The national ratio of doctors to the population is about 1 to 10,000 and this puts a lot of pressure on doctors generally. Other frontline health professionals like pharmacists and nurses tend to be equally over tasked, so they also fail apparently to complement the work of doctors especially in the area of interactions and discussion of issues pertaining to prescriptions and prescribed items. There seems therefore to be a problem in the general education of patients with regards to their disease conditions and the use of pharmacotherapy as well as life style changes.

Patients attending these outpatients' clinics are mostly financially handicapped with no insurance policy on their health in place. In addition, social status, religious beliefs, lifestyle habits, open prescriptions and OTC purchase of medication which are mostly detrimental to normal health, are practiced openly without regard to obvious danger signals. Hospital procedure is normally cumbersome and are not relaxed and made easy for patient. Follow up practices are not made easy for patients to follow. These possible problems may have resulted in poor adherence to recommended therapy thus leading to severe diarrhoeal cases and their associated complications.

## **1.3 Main Aim**

The main aim of this research is to determine whether prescribers at the P.M.L. are adhering to the treatment guidelines on the management in children less than five years with diarrhoea as proposed by M.O.H. standard treatment guidelines and management on the part of parents of

patient with diarrhoea. In addition to determine the prevalence rate of diarrhoea in children less than five years at P.M.L.

#### **1.4 Objectives**

- 1 To identify the number of patients less than 5 years diagnosed with diarrhoea at the PML.
- 2 To study the various treatments given by the prescribers for treatment of diarrhoea in children.
- 3 To compare the standard of prescribing recommended by Ministry of Health (M.O.H) Ghana with findings to ascertain whether it is being followed.
- 4 To look at the management of diarrhoea in the perspective of both the prescribers and the parent/ care taker of the patient.
- 5 To recommend if possible, practicable guidelines for the management of diarrhoea in children less than 5 years in the P.M.L. based on the findings of the research.
- 6 To disseminate findings to Ghana Health Service (G.H.S.) with the aim of influencing policy.

## **CHAPTER TWO**

### **METHODOLOGY**

#### **2.1 Population under Study**

P.M.L. states in their 2004 1<sup>st</sup> 3 quarters report as having daily average attendance of 143 total patients visiting the hospital made up of an average of 85 new attendants and 58 old attendants. It is estimated that about 90 percent of these patients are children below 5 years of which about 11 percent report with diarrhoea and other related problems.

#### **2.2 Method of Enrolment**

One thousand one hundred and sixty eight (1168) Prescriptions cards were analysed. Patients examined were out-patient; the time of study was from 8:00 am – 2:00pm. Prescriptions picked were sorted out to retrieve those diagnosed of diarrhoea aged 5 years and below. The research used a 14 days prescription analysis. Survey questionnaire was also developed. It has two (2) sections: demography, and prevalence and management. The reason for the survey was clearly stated.

Parents of seventy (70) patients were enrolled through a random selection of folders, five (5) on each day. They were invited to participate in the research and their particulars noted. Those who accepted to participate in the survey were directed to the interviewer after they had collected their prescribed medications. The purpose of the survey was clearly explained to these patients before the survey questionnaire was administered. The number of patients who refused to participate was not recorded as the next one in line is then approached, but the number of patients who answered some questions but later objected because of time constraints or other reasons were recorded.

### **2.3 Inclusion Criteria**

All patients diagnosed as **having** diarrhoea aged 5 years and below prescriptions were analysed. It also included patient with multiple ailment inclusive of diarrhoea

### **2.4 Exclusion Criteria**

Patients who fell outside the inclusion criteria, e.g those diagnosed with diarrhoea above 5 years, and those diagnosed of other ailment aside diarrhoea.

### **2.5 Sampling**

**Parents of seventy (70) patients were enrolled through a random selection of folders, five (5) on each day.**

### **2.6 Consent**

Permission in writing was sought from the then director, Dr. Dorcas Anfo to use records from the hospital for the project. The consent from the director was given before the start of the work. The other medical providers had no knowledge of the research work and the start of it. Prescribers were not influenced.

To maintain confidentiality and genuiness of research I wrote to the Senior Medical Officer in charge and discussed the whole project with her.

Consent and collaboration were sought from the pharmacy department and Records office.

## 2.7 Ethical Approval

Ethical approval was sought from the Kwame Nkrumah University of Science and Technology, Department of Clinical and Social Pharmacy.

## 2.8 Data Collection

Two different instruments were used, a survey structured questionnaire with observation check list for patients and strict scrutiny of prescription.

A survey questionnaire was administered to the parents of patients individually in the form of face-to-face interviews. Each parent who accepted to participate was interviewed. For consistency, the same people acted as interviewers in all cases so as to prevent error in the interview styles. Some parents decided to opt out after answering some few questions, whilst others left some questions unanswered.

Although patient's name was not recorded, numbers were assigned to each patient. Information picked on the prescription form includes: patients name (numbers), date, prescribers, residence, age, gender, weight, laboratory request, temperature diagnosis if any, actual diagnosis of diseases, and prescribed medications. **Doses which were questionable were** not taken into account. The type of diarrhoea whether acute or not were checked and noted if only diagnosed.

The pharmacist helped with information and contact with record officers and director of the hospital. The technologist helped with the retrieving of record to confirm diagnosis etc and appropriate measures made or taken and any other required information not captured on the prescription form.

Secondary information was obtained from the annual report of Princess Marie Louis Hospital (PML). Others were from medical and pharmaceutical journals. Some Internet search engines also yielded information especially for literature review.

## **2.9 Data Analysis**

Data collected were edited to check for consistency and accuracy of the information collected. Qualitative data which needed interpretation were studied and coded to allow for easy recording and analysis by a computer program known as Statistical Package for Social Sciences (SPSS). Most questions were closed, so much interpretation of individual view was not required. Other analysis of the data was done on Microsoft Office Excel using appropriate statistical tools.

## **CHAPTER THREE**

### **RESULTS AND DISCUSSION**

#### **3.1 Introduction.**

All one thousand one hundred and sixty eight (1168) prescriptions cards picked were sorted out to retrieve those diagnosed of diarrhoea aged 5 years and below. Twenty eight (28) percent of the (327 prescription cards out of 1168 prescription cards) total number of patients were prescribed antidiarhoeal agents.

The response rate of participant was a 100 percent, since all the seventy (70) parents agreed to participate. However, some parents opted out in the course of the interview section citing time constraints. Others left some questions unanswered but were included in the final count.

The results are presented in three sections of A, B and C in the following order, demography, quality of patient care, prevalence and management.

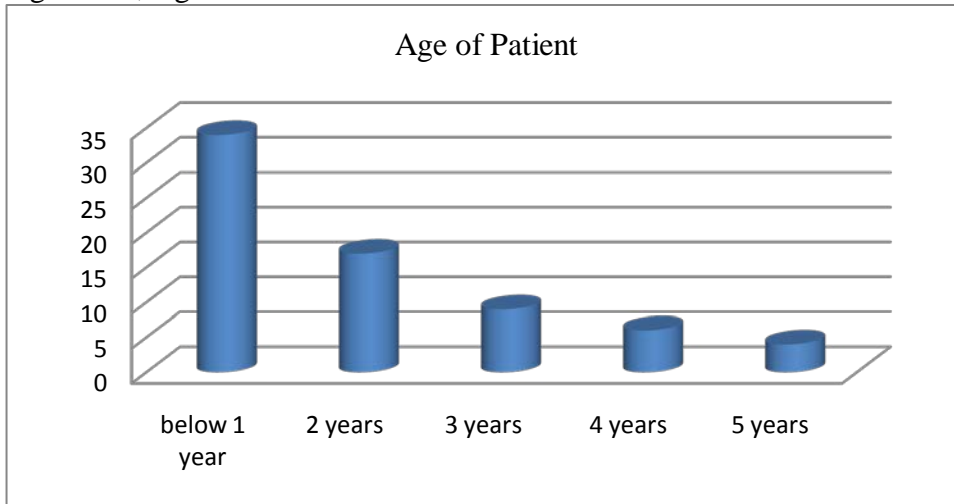
#### **3.2 SECTION A: DEMOGRAPHY**

##### **3.2.1 Age Distribution of Patients**

There is a clear indication that those below the age of 2 are likely to be diagnosed of diarrhoea in any given population (**figure 3.1.**) This is not surprising because of poor sanitation in our environments and lack of personal care of busy mothers. The number with diarrhoea declines with increase in age.



Figure 3.1; Age Distribution of Patients

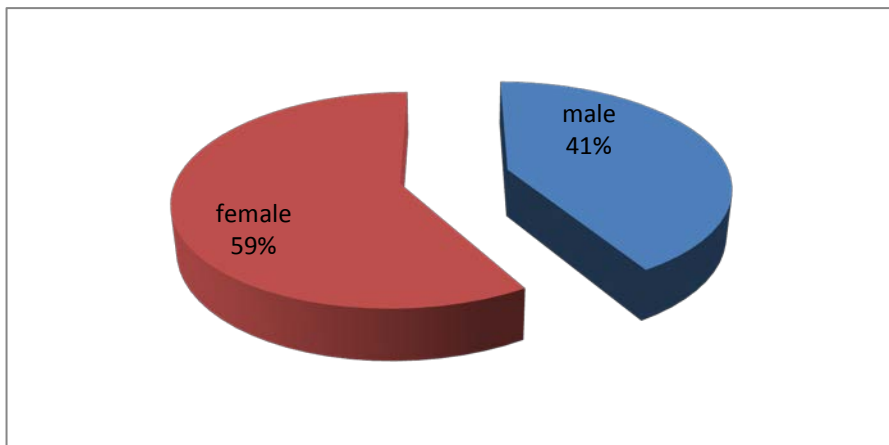


Source: Authors' Field Survey, January, 2004

### 3.2.2 Sex Distribution of Patients

According to the questionnaire, forty one of the children representing 59 percent who were diagnosed with diarrhoea were female as against twenty nine males representing 41 percent.

Figure 3.2: Sex Distribution of Patient



Source: Authors' Field Survey, January, 2004

This is in conformity with the annual report on attendance patterns to the Hospital in general.

This also follows the normal population distribution trend in the country.

### 3.3 SECTION B: QUALITY OF PATIENT CARE

Table 3.1: Diarrhoea

DAY	DATE	NUMBER OF PERSONS PRESC ANTIDIARR AGENT	NUMBER OF PERSONS DIAGNOSED
1	5/1/2004	14	12
2	6/1/2004	20	19
3	7/1/2004	17	15
4	8/1/2004	30	25
5	9/1/2004	24	20
6	10/1/2004	23	16
7	11/1/2004	22	11
8	12/1/2004	25	20
9	13/01/04	16	12
10	14/01/04	43	30
11	15/01/04	20	16
12	16/01/04	17	15
13	17/01/04	30	20
14	18/01/04	26	12
Total		327	243

Source: Prescription Cards Analysed, January, 2004

Three hundred and twenty seven (327) out of one thousand one hundred and sixty eight (1168) Prescriptions cards analysed were prescribed with anti diarrhoeal agents like metronidazole, loperamide, pythalylsulphathalazole, kaolin representing 27 percent. ORT should have been used more because mothers interviewed show that their children were weak and some showing signs of mild dehydration.

Only 243 out of 327 patients had their prescription forms diagnosed as having diarrhoea representing 74.3%. Patients examined were all out-patients. Diagnosis should have been 100 percent because each patient had to be diagnosed for proper management.

One hundred and eighty (180) out of 327(55%) prescribed with antidiarrhoeal agents had their ages recorded. Almost half (45%) of the patients did not have their ages recorded and one wonders how their prescriptions were group to be managed. Age is important for correct dosing. One wonders again whether there was the need to prescribe that number of antidiarrhoeas. The number prescribed antidiarrhoeal agent was quite high and there should have been more laboratory request.

TABLE 3.2: CLINICAL QUALITY OF PATIENT CARE FOR CHILDREN UNDER 5 YEARS

DAY	PRESC ANTIDIARR AGENT	GENDER	AGE STATED	WEIGHT CHECK	TEMP TAKEN	DIAGNOSIS
1	14	Nil	10	Nil	5	12
2	20	Nil	12	Nil	6	19
3	17	Nil	10	Nil	12	15
4	30	Nil	20	Nil	10	25
5	24	Nil	13	Nil	6	20
6	23	Nil	12	Nil	11	16
7	22	Nil	11	Nil	10	11
8	25	Nil	12	Nil	13	20
9	16	Nil	10	Nil	8	12
10	43	Nil	20	Nil	15	30
11	20	Nil	14	Nil	10	16
12	17	Nil	11	Nil	8	15
13	30	Nil	13	Nil	9	20
14	26	Nil	12	Nil	11	12
Total	327		180		134	243

Source: Prescription Cards Analysed, January, 2004

Weight of the patient checked was not recorded in their folders. This is because it was not on the card from the prescriber. Prescription of patients stands isolated. The gender on the prescription cards were not stated but if stated could have helped to be compared with that of the questionnaire.

One hundred and thirty four (54.25) who were diagnosed of diarrhoea had their temperatures recorded. For good medical practices, this figure should have been 100 percent since fever when diagnosed can be a leading factor to disease state.

There was irrational prescribing and this could explain the inconsistency in the non recording of the diagnosis and those that were prescribed antidiarrhoeal agent. It could also be that prescribers prescribe just by observation. Information gathered also shows a normal practice of prescribing. The format of the prescription form does not help define affected patient and their medication.

### **3.4 SECTION C: PREVALENCE AND MANAGEMENT**

#### **3.4.1 PREVALENCE**

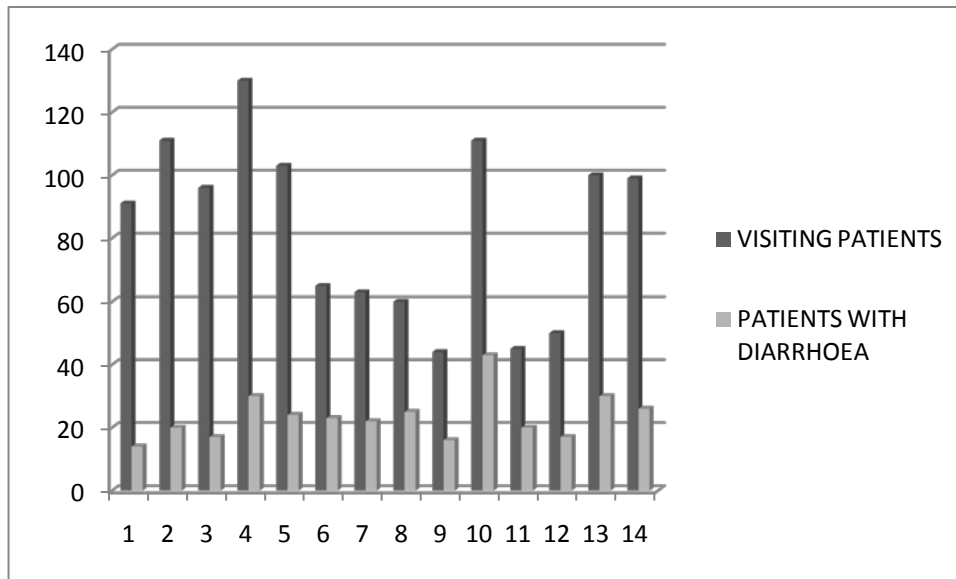
The total number of children under age 5 who visited the hospital for the 14 days were 1186, three hundred and twenty seven (327) were diagnosed with diarrhoea giving a high prevalence of nearly 28 percent. This shows that diarrhoea is a real problem in the community.

On the average 84 children below the age of 5 visits the hospital. Figure 3.1 gives a clear indication that those below the age of 2 are likely to be diagnosed of diarrhoea in any given population. The result confirms studies by Carlos et al. (1990) which state that of the estimated five million deaths in children less than 5 years, about 80 percent of deaths occur in children in the first 2 years of life.

On the average twenty four (24) of the children of ages 5 and below were diagnosed of diarrhoea daily. The prevalence rate which is the average number of the children of ages 5 and below

diagnosed of diarrhoea as a percentage of average number of children visiting the hospital was 27.57 percent.

Figure 3.3: Prevalence of Diarrhoea among Children below 5 years



Source: Prescription Cards Analysed, January, 2004

### 3.4.2 MANAGEMENT: The perception of mothers of patient less than 5 years of age

- Understanding of diarrhoea

Five parents of patients interviewed representing 7.1% claimed to have very sound knowledge of condition of which their child has been diagnosed, whilst the remaining sixty five (92.9%) claimed no knowledge. Of these sixty five (92.9% of 70 participants), fifty two (80%) had sound knowledge of diarrhoea, the rest thirteen (20%) were confused. In effect thirteen (18.5%) of the parents interviewed were not knowledgeable.

On the issue of honouring appointment with doctor, all the seventy participants do honour appointments to see their doctor.

Asked whether they do consult a Health professional when their child suffer similar condition Sixty (85.7%) of the parents prefer to see the doctor first and this is a healthy sign.

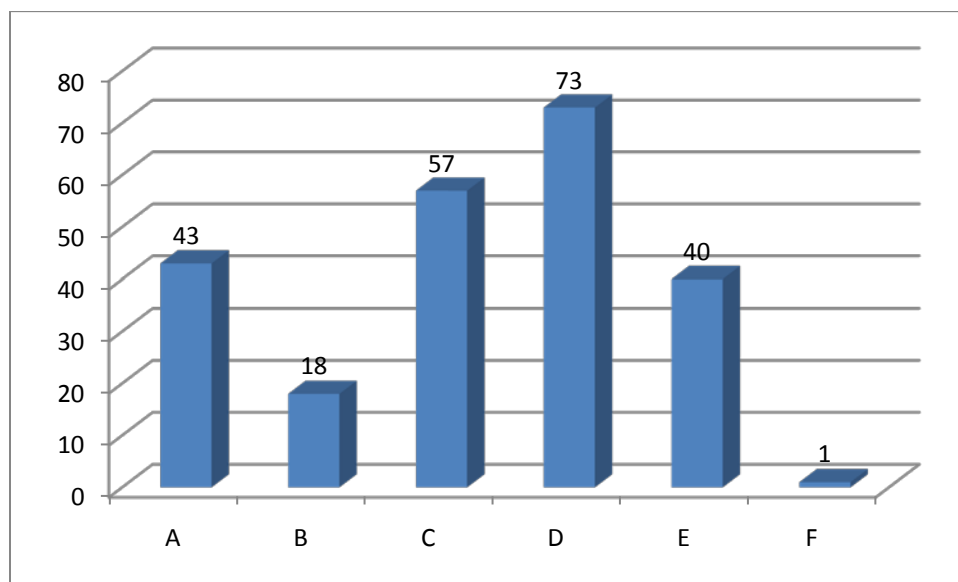
To the fact that health professionals talk about diarrhoea to them when they visit, all seventy participants claimed that they do not interact with the health professional. Out of the seventy parents interviewed who claimed that they have not been told about diarrhoea, sixty seven (95.7%) of the participants felt that they should be told about the condition of their child. It is a good sign for the mothers to have realized this themselves. It was not surprising that all the participants answered no to a question whether they were told about the detrimental effects of certain habits to their child's health emphasizing the long standing poor relations between parents and providers of medical service.

To the question as to whether they were given any written material to help them understand their child's condition better, all the seventy participants said no. If written materials had been given it would not have helped much because just by this short interview it was realized that most of the parents were not quite literate and so oral interaction is mandatory.

On what they know about the medications they have bought, Forty-two (60%) had fair knowledge about their medications, while the remaining twenty-eight (40%) were not knowledgeable. The figure 40 percent is quite high and gives the needs for mothers to have more education on their medications given to help patients in reducing the incidence of diarrhoea and other diseases

On the other score some of the participants who could not identify the medication given, were able to state the name of these medication, probably due to familiarity not forgetting the fact that a lot of over the counter purchase of medication goes on as far as treatment of diarrhoeal disease is concerned.

**Figure 3.4: An Overview of Medication Prescribed for the Management of Diarrhoea.**



Source: Prescription Cards Analysed, January, 2004

**Key**

- A. Total number of children less than 5 years prescribed with ORS
- B. Number of children less than 5 years prescribed with iron tonics (18%): 59 of 327
- C. Children less than 5 years prescribed antimalarial(57%): 187 of 327
- D. Children less than 5 years prescribed antibiotics
- E. Anti diarrhoeal agents (40%): 131 of 327
- F. I. V. fluids (1%): 5 of 327.

One hundred and forty (43%) were prescribed ORS. The number is quite good, at least ORS was prescribed but could have been higher.

Two hundred and forty (73%) were prescribed antibiotics. Some antibiotics can be prescribed without laboratory test so it was good for metronidazole, tetracycline etc to be given but with that high number of prescription one can not really defend this. Antibiotics used includes amoksiklav (amoxicillin plus clavulanic acid), erythromycin syrup, chloramphenicol syrup, syrup co-trimoxazole, crystalline penicillin injection, amoxycillin, tetracycline capsules, cloxaclin syrup and suspension fluclaxacillin, nystatin oral drops, nalidixic acid tablet, metronidazole tablet and syrup, metrolex-F (metronidazole plus flurazolidone). One or two of the named antibiotics were used by patients in a day. In some cases 3 antibiotics were prescribed for a patient and in most cases metronidazole or in combination with flurazolidone featured prominently

Iron and vitamins used includes astymin, zincofer, zincovit, lexaglobin, lysatone, haematovite, vitamin C / ascorbic syrup, etc – only two were pure iron preparation. The others were either a combination of the two or plain multivitamin syrup

Antidiarrhoeal agents prescribed include ORS, kaolines pepto bismol suspension, diagegellates (local antidiagegellates suspension)

I.V. fluids prescribed were dextrose saline 5%, and ringers lactate.

There is the need for general education, counselling at the pharmacy and this should be done in such a way that it will satisfy all patients



## **3.5 Discussion**

### **3.5 .1 Demography**

The environmental conditions that were prevailing in the community and some parts of the hospital are indices that could promote diarrhoea and its referral.

By observation (PML) Children hospital can be considered as a neat hospital and in fact has been accredited at least two times as a number one friendly hospital in Accra. However their surroundings and the place given to mothers whose children are detained or hospitalized is nothing to write home about.

People of the community are the cause of their unhealthy environment and this is evident by the way they dispose of faeces and rubbish in black polythene bags and into open gutters. Also, pit latrines are in this day and age commonly found in the community and most people empty their pans of latrine and refuse in the drains especially when it is raining. This discharge of raw sewerage goes into the surrounding rivers and sea.

Considering the number of persons residing in cubicle houses around and also the overcrowding situation that is always observed at the O.P.D, one can say that the population in the community is obviously high. A crowding index can easily be used to estimate the density of crowding in the home. It is defined as the total number of family members in the home divided by the total number of rooms in the home excluding the kitchen and bathroom. The result is high if score is more than 3 co residents per room indicating that it should be a factor.

It is even surprising that only one percent (5 out of 327) of person diagnosed with diarrhoea were treated for near fatal conditions. As a dispenser in the community, I can attest to the fact that prescription for cholera is very common each time there is a hint of an outbreak of cholera in the area.

There is the other factor that there is a high poverty level and most people cannot afford simple medications prescribed. Parent of the patients always request for partial dispensing of their prescribed medication because they cannot afford the fee.

Loitering is common because youth and elders (working age- most of them not more than 40 years of age) who are most of the time responsible for giving birth to these children are seen sitting around playing cards or enjoying their alcoholic drinks. They have no permanent source of income and some cannot afford flush toilets and running taps.

Almost all the mothers interviewed were traders. Eighty percent (80 %) of these are the very people who make time to send their babies for medical attention. Mothers sometimes are overstretched because they have lots of responsibilities at home and may be working mothers. Hence, reducing the time they need to spend at health facilities is important. The question of diarrhoea as to how most mothers understood it was varied and some did not even have a clue as to what was happening and this is not surprising because they have to trade from morning till evening and so may not have time to be educated.

The study found that more female tends to have diarrhea than male. This can be considered as towing the normal population distribution trend in the country where the females out number the males. PML records also show same. In this research about 60 percent of the diarrhoea cases were presented by females. Probably due to the fact that most young girls sit and play in the

sand with their hands buried in it and this will certainly predispose them to diarrhoea compared to males who get use to the football field at an early stage or always busy dismantling toys. Age distribution on the other hand was quite spread.

### **3.5.2 Quality of patient care**

Although Prescribers treat children, most of the discussion on the child's pharmaceutical care is with the elderly caretakers. Ghana today.com state that adult illiteracy rate (i.e. percentage age for 15 years and above) is 73.80 percent. In the same way the ratio of the poor as percentage of total population is 49.9 percent. It also state that most Ghanaians engage in petty trading. The World Bank Development Indicator (2003) state that for every 1000 persons, the crude birth rate is 30.9 percent.

All these indicators clearly compares to the situation under review and points to the fact that quality of patient care is of prime importance.

In this study, written diagnoses were scanty but 243 (73%) had their prescription form diagnosed as having diarrhoea. This is quite high even though not all the patients were diagnosed. From figure 3.4, number of children less than 5 years prescribed antimalarials stood at 57 percent and 18% were prescribed iron tonics. Tonics and vitamins featured prominently showing the state of out – patients meaning the patients were lacking in these. Malaria and anaemia was treated at the same time was because it was recognized as a factor to be considered. The problem can actually be traced to malnutrition and environmental issues.

It is interesting to note that though diarrhoea is a symptom for malaria, it was not stated as a written diagnosis. It could be there was an inference from the temperature of the patient taken. Whether that really happened it is not known and was not recorded.

It is interesting to note that temperature was not taken for every patient and also no child presented was weighed and this makes one wonder how best dehydration was handled. Weight measurement is essential when prescribing as most medications are weight dependent. Reasons are not clear and given why temperatures were not taken for some patients. This is not appropriate because it is an important a pointer to proper diagnosis as it indicates increase in infection. It could be that it was not a priority to the prescribers may be due to pressures at work or not an interest to them because it is not part of their normal practice. Also record keeping sheets did not have them stated hence the staff could not be bothered. These recordings definitely must be of priority since for a kwashiorkor outfit or pediatric hospital these are important indices to treatment of patients. An accurate diagnosis is essential before beginning treatment because symptomatic therapy may not be appropriate.

To enhance quality of care at P.M.L., the nursing staff should be monitored and new cards must be designed with all parameters required on them and health directors given strict instructions to be obeyed. Offering pharmaceutical care counseling and education of parents should be paramount. It must not be taken for granted that mothers know or others can read instructions to them to follow since it is likely that the medication may fall into the hands of another lot of illiterates to be administered. At least they must understand the treatment to avoid referrals.

There was also irrational use of antibiotics, sometimes as many as three antibiotics are used for one patient example metronidazole, co- trimoxazole and chloramphenicol suspensions used

together with antimalarials for a patient. This is dangerous when no reasons are stated at least if laboratory examination is not done, stool condition and consistency must be clearly stated and the conditions of the patient by observation also noted and stated where necessary. However, prescribers should be mindful of the fact stated by the MOH that most disease state of diarrhoea is viral.

Prescribing pattern of all prescribers tended to follow the same pattern and some were actually identical. One cannot apportion blame but it is dangerous and shows that the prescribers are used to a certain style of prescribing and fail to treat patients individually. This should be noticed by the director who should have a supervisory role and not only act as an administrator, and prescribers should adhere to the MOH guidelines on diarrhoea management.

### **3.5.3 Prevalence of Diarrhoea**

In this research work at PML, 28 percent of children less than 5 years who visited the hospital within the two weeks period in which the survey was conducted had diarrhoea. This high prevalence of diarrhoea may be due to environmental factors and low maternal education.

Most of the caretakers were found to have limited education, therefore less likely to adhere to proper handling of food, such as boiling of water before use. However, with caretakers of children under two years the boiling of water may not be much of a factor, now that most mothers know why strictly breast feeding is important. Yet still some times there is the tendency to use bagged or bottled water which may not always be free of bacteria for the safe preparation of children's food and ignoring other hygienic practices.

Malnutrition is not a big factor when dealing with children less than 2 years since most mothers adhere to strict breast feeding; but nutritional status of mother is important and so when mothers take all sort of concoction and food, the children may be at risk of diarrhoea. It is important to stress that malnutrition causes diarrhoea especially in children who have been weaned of breast milk and are now eating normally hence policies and poverty reduction strategies should be adopted to help curb malnutrition.

Flush toilets are useful when water is available 24 hours in a day (Kung'u et al, 2002) but in a situation like ours where the pipe water does not flow frequently, the use of flush toilets rather aggravate diarrhoea. Also diarrhoea stands out as a serious health problem in the over crowded Kibera Slum probably because of poor environmental conditions, and low educational level of mothers.

Inadequate health information may be due to lack of logistics at the hospital, lack of education and counseling and differences in behaviour (eg intelligence level, breastfeeding practices), environmental hygiene and socio economic factors.

#### **3.5.4 Overview of the medication prescribed**

Tally sheet of OPD diarrhoeal research showed varied prescriptions of different antidiarrhoeal agents and constantly together with prescription of antibiotics not based on laboratory request or reports. Only two laboratory request were spotted in the total number of patients for the whole 14 days scrutiny of the prescriptions. The fact that there was no laboratory test was not appropriate. This was required at least for one antibiotic prescribed- penicillin V (phenoxymethyl penicillin) used mostly probably for pneumococcal infection.

The M.O.H. standard treatment guidelines gives the following conditions

- To avoid combination drugs unless there is a significant therapeutic advantage over single ingredient preparations (eg co-trimoxazole)
- Avoid the use of symptomatic treatments for minor self limiting conditions
- Avoid where possible the prescribing of placebos but spend a little time educating and reassuring the patient
- Avoid multiple prescribing (poly pharmacy) especially when diagnosis is not clear
- Avoid the use of parental route of administration where there are no clear clinical indications.

All these don'ts were however practised.

Also in collecting the data for this research it was noted that a lot of worm medications were prescribed, may be due to the fact that worm infestation is a health problem in the community. There was also no stool examination over the period. One notes here that not all diagnosis for antibacterial treatment needs laboratory reports. But considering the huge number of patients assessed over the 14 days period and the large number of patients prescribed with antibiotics (73 percent), it would have been ideal if some diagnostic reasons had been stated for easy understanding of disease state.

M.O.H. guidelines requests laboratory reports and allows metronidazole, co – trimoxazole, tetracycline to be used without examination of stool if there is blood in stool but only two antibiotics to be used at a time. However, Hogue (2000) states that the use of antimicrobial

therapy in the management of diarrhoea is controversial and is only indicated in severe cases persisting for more than 48 hours, passing six or more stools and or associated with fever; blood or pus in the stools.

Medication schedules and doses on treatment cards or prescriptions (ineffective prescribing pattern as pertaining to management of drugs) were not the best. This is a big set back because almost all the patients were out patients. The choice of drug and dose were not individualized and it seems the medical assistants have a certain form of treatment pattern not in line with MOH guideline on the management of diarrhoea.

Doses of antibiotics given were quite high with doses ranging from co-trimoxazole bd for 7 days, chloramphenicol 250mg qid x 7, metrolex-F suspension 5ml tds x 7, and metronidazole 10ml tds x 7 and these did not have comparative diagnoses. Doses that were weight dependent, was also a problem to check as weights were not recorded.

Treatment with ORS should have been used more because of its safety and efficacy. Antibiotics combined with antidiarrhoeal agent far out numbered the use of oral rehydration therapy and care must be taken since they are not necessary for mild attacks especially as they may induce antibiotic resistance.

### **3.2.5 Perception of Carers**

Carers of children less than five years old interviewed perceived medical staff as saviours. However these carers recommended that the medical staff should make time to counsel them to understand every action they are asked to take especially when there is the need for referrals to



be made. Co-ordination and cooperation is needed to ensure that carers get the needed care to ensure compliance. Education improves compliance.

### **3.6 Importance of Findings.**

The fact that the MOH guidelines was not adhered to was not surprising since I have served prescription from PML at my pharmacy sited just 100 yards from the hospital for over twenty five years. However, I am glad to confirm that petty prescriptions of  $\frac{3}{4}$  tablets of phthalylsulphatalazole etc to be crushed for patients had stopped since I have not observed such prescription through practice for some time. Previously it had been a constant practice.

Diarrhoea has been confirmed as one of the commonest diseases prevalent at P.M.L. However most prescribers did not pay much attention to the laid down treatment guidelines for treating diarrhoea, thus the treatment guidelines was not followed. One wonders whether prescribers are aware of the standard treatment guidelines and also would have had time to consider in detail other ailment or drug reactions by the patients before prescribing.

This finding extends the literature in the prevalence and management of diarrhoea in children less than five years old. Furthermore, the findings of this research should be disseminated to stake holders and the hospital management to ensure that polices and regulations are put in place to ensure strict adherence to the M.O.H. standard treatment guidelines.

### **3.7 Comparison with Other Similar Work**

A research on prevalence and risk factors of diarrhoea and acute respiratory infections among under-five children in Iraq by Siziya et al (2000 ) states that diarrhoea and acute respiratory conditions are common medical conditions for children under 5 years in resource limited countries . For that matter improvement of water quality, and sanitation are vital in reduction of

diarrhoeal diseases. Such information is also useful to identify children at risk of diarrhoea and acute respiratory infections.

Again, to evaluate successes in the clinical management of severe diarrhoeal diseases in a busy referral hospital in Ghana, four years after the introduction of the World Health Organization's protocol for the clinical management of diarrhoea and the establishment of an oral rehydration therapy, Baffoe-Bonnie et al, "Diarrhoeal Diseases in Hospital in Ghana" yielded similar results.

The average overall diarrhoeal disease mortality over the period was around 20% with twice as much deaths among adults than among children. There was a tendency of decline in childhood mortality, whereas it was much less evident among the adults. The high mortality caused by diarrhoeal diseases in the hospital and the differences in adult and childhood mortality were related to the problems in case management that stemmed from diarrhoea case management training of clinical staff with a bias towards the paediatric staff, and also from the loss of several trained staff members through transfers and other staff replacements within the hospital. There were similarities in the trend of admissions for adults and children over the period, which suggested a possible common etiology for severe diarrhoeal diseases recorded in the hospital.

Child Health Research Project (1998) found out that a number of different social, political, and economic factors that are present in Sub-Saharan Africa contribute to the constant morbidity from acute and persistent diarrhoea, as well as intermittent epidemics of cholera and dysentery common to this region of the world. Morbidity and mortality from childhood diarrhoea, whether due to invasive enteropathogens such as *Shigella* or the more commonplace rotavirus, are further compounded by inappropriate household case management and the frequent misuse of antibiotics. Limited knowledge among many health care providers of the proper treatment of

diarrhoea also contributes to poor outcomes. The overuse of antimicrobials exerts a selective pressure for the development of antimicrobial resistance throughout the continent. Antimicrobial resistance will increasingly limit a practitioner's ability to successfully manage cholera and dysenteric diarrhoeas.

### **3.8 Limitations**

Due to the fact that there was insufficient diagnostic data the type of diarrhoea being treated was not clear.

The fact that the ages of most of the children were not stated made it difficult to identify all children less than five years of age.

It was also difficult to distinguish between in-patients and out-patient prescriptions. There was no mark of differentiation.

It would have been ideal to do a monthly surveillance and compare with a clearly stated definition of diarrhoea.

## CHAPTER FOUR

### CONCLUSION AND RECOMMENDATION

#### 4.1 Conclusion

The prescribers did not follow the treatment guidelines as proposed by WHO/MOH. Plain and complicated diarrhoea seem to have been treated the same. It was found out that both medical officers and medical assistants were using the same prescribing pattern. The findings did not confirm the use of the treatment guidelines as previously stated by the director for the hospital.

It was identified that within the age range of up to five years, children less than two years of age were found most at risk of contracting diarrhoea. Treatment pattern varied and did not conform to any standard given. Both prescribers and parent are very important as far as management of diarrhoea is concerned and this must be communicated to them in a meaningful manner.

I must congratulate PML for working to upgrade themselves from merely a kwashiokor attendance unit to a paediatric hospital (though not fully well established) and a treatment outfit for adults as well. My personal interest would have been to see them as a fully functional paediatric hospital since the issue of children is of prime importance when it comes to care

#### 4.2 Recommendations

- 1 A much more detailed diagnosed sheet should be made available for the management of the disease

- 2 The cause of diarrhoea should be determined before treatment is begun and specific therapy be chosen for each of the causes. In some cases it looks like medication given has no basis being there. Drug regime specifically designed for the patient and the cause of diarrhoea based on good clinical studies have a high success rate for the treatment. This order and care is needed to minimize side effect and referrals.
- 3 It is recommended that waiting time for the patient before being attended is reduced to avoid prescribers rushing through treatment and patient being frustrated because of long delays.
- 4 The M.O.H treatment guidelines should be followed as expected of prescribers. The directors are to ensure this with more education and extra attention on the medical assistants. Education of clinical staff can reduce the in-hospital use of intravenous fluids for dehydration, increase the use of ORS for mild-moderate dehydration, and decrease costs at least temporarily. Developing an oral rehydration therapy unit for first line therapy of children with diarrhoea in Lesotho resulted in a significant decline in hospitalization rates (Heymann et al., 1990)
- 5 Carers of patients should be adequately counseled to minimize referrals. Counseling points should include the use of laxative, instruction to travelers. It should also talk about safe food and water precautions which are the mainstream of traveler's diarrhoea prevention.
- 6 There must be co-operation between patient and clinician for easy and correct physical examination, history, diagnosis. Inference from data on patients still show the existence

of a barrier of communication between prescribers and needs to be seriously looked unto for cordiality to prevail.

### **4.3 Areas for Further Work on Areas of Interest**

A possible follow up will be to monitor compliance with standards.

Follow up researches envisaged

- Symptomatic and asymptomatic diarrhoea
- Death ratio in diarrhoea /mortality/morbidity from acute/unhealthy state persistent. This forms a bigger percentage of total volume of patient on day to day bases (NB mortality rates increased in the presence of HIV infection)
- Medication use and misuse in paediatric diarrhoea.
- Studies of specific pathogens causing diarrhoea in children
- Treatment and prevention of diarrhoeal disease control programmes; management with homes use treatment of ORS.
- Causes of diarrhoeal disease in children
- Evaluating nutritional status of diarrhoea in children (e.g. chronic/ persistent diarrhoea and malnutrition). Available research shows that children 6 – 8month age range are not likely to develop persistent diarrhoea
- Rates of hospitalization for diarrhoea

- Seasonal variations in incidence of diarrhoea
- Vitamin A deficiency and prevalence of diarrhoea (NB receives a lot of prescription from PML for vitamin A)

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## APPENDICES

### APPENDIX 1 TREATMENT PLAN

#### Treatment Plan A - No Dehydration

- Child can be treated safely at home
- Instruct mother to give Home-based fluids like rice water, koko, soup, water and ORS.

Breastfed babies should be given breast milk and ORS

Give as much as child wants of all the fluids

<u>AGE</u>	<u>ORS (basic amount)</u>	<u>ORS per stool</u>
< 2yrs	500ml or more	50-100 ml
2-10yrs	1000ml or more	100-200 ml
>10yrs	2000ml or more	100-200 ml

#### Treatment Plan B – mild dehydration

- Child should be treated in the clinic
- Give ORS in the first 4 hours as shown in the table If child vomits, wait for 10 minutes and start again
- Check out for signs of worsening dehydration or improvement and manage appropriately after the 4 hours.

WEIGHT	6KG	6- 10KG	10-12KG	12-19KG
AGE	Up to 4 months	4-12 months	1-2 yrs	2-5yrs
AMT OF ORS	200-400ml	400-700ml	700-900ml	900-1400ml

#### Treatment Plan C – Severe Dehydration

- A child with severe dehydration requires treatment with IV fluids in Hospital.
- Start IV fluids immediately. Give;
  - 100ml/kg R/L, N/S, Cholera replacement fluid( 5:4:1) divided as shown in Table for Plan C below
- Reassess the child every 1 – 2 hours. If hydration status is not improving, give the IV drip more rapidly.
- Also give ORS as soon as the child can drink.
- Reassess and infant after 6 hours and a child after 3 hours.
- If possible patients should continue to eat and breastfeed during the period of diarrhoea.

APPENDIX 2 DATA COLLECTION FORM

**FORM TO SAMPLE DIARRHOEA PATIENTS**

**NAME OF UNIT: O.P.D DATE:.....**

**DATA COLLECTOR:.....**

<b>FOLDER</b>	<b>NAME</b>	<b>AGE</b>	<b>SEX</b>	<b>DATE</b>	<b>DIAGNOSIS</b>	<b>1<sup>ST</sup> ATTN. DATE</b>

**APPENDIX 3: DATA COLLECTION INSTRUMENT FOR DIARRHOEA PATIENTS.**

**PREVALENCE AND MANAGEMENT OF DIARRHOEA IN OUT-PATIENT CHILDREN UNDER 5YEARS AT THE PRINCESS MARIE LOUIS HOSPITAL (P.M.L.), ACCRA, GHANA.**

Dear Client.

This interview is designed to find out your views on prevalence and management of diarrhoea in children under 5years of age by healthcare professionals such as doctors, pharmacists and nurses when you visit the hospital. You have been included in this survey because your child has been diagnosed of diarrhoea. Your answers will be strictly confidential.

**A: DEMOGRAPHIC DETAIL OF THE CHILD**

- 1) Age below 1 [ ] 2 [ ] 3 [ ]  
4 [ ] 5 [ ]
- 2) Sex Male [ ] Female [ ]
- 3) Educational Level Crèche [ ] Nursery School [ ]  
Primary [ ] Other [ ]

**B: PREVALENCE AND MANAGEMENT OF DIARRHOEA**

- 5) Do you understand the medical condition for which your child have been diagnosed?  
Yes [ ] No [ ]

a) If yes, can you tell me about it?

.....  
.....  
.....  
.....

6) Do you regularly honour appointment dates with your doctor?

.....  
.....  
.....

7) Which of these healthcare providers are you most likely to see when your child suffer from similar ailment

Doctor [ ]            Pharmacist [ ]            Nurse [ ]  
Chemical Shop [ ]    Herbal Clinic [ ]            Traditional healer [ ]

8) Do healthcare professionals like doctors, pharmacists, nurses tell you about diarrhoea? The dos and don'ts

Yes [ ]            No [ ]

a) If yes, can you recall some aspects of what you were told?



.....

b) If no, do you think they should tell you more about this

Medical condition?

Yes [ ]

No [ ]

9) Did these healthcare professionals tell you that certain habits could be detrimental to your child's health?

Yes [ ]

No [ ]

10) Have you ever been given any reading material to help you understand your child's condition better?

Yes [ ]

No [ ]

11) What do you know about the medications that you have just bought for treating your child's condition?

.....  
.....  
.....

12) Can you point out to me, which medication is for diarrhoea?

.....

13) How would you know if your medication is effective or not?

.....  
.....

14) Do you think that healthcare professionals should tell you more about your child’s condition?

Yes [ ] No [ ] Indifferent [ ]

15) Do you think that you would benefit more by receiving information leaflets about your child’s condition that you can read at your own convenience?

Yes [ ] No [ ] Indifferent [ ]

C: DEMOGRAPHIC CHARACTERISTICS OF THE PARENT

16) Age 18-30 [ ] 30-40 [ ] 40+ [ ]

17) Sex Male [ ] Female [ ]

18) Educational Level JSS [ ] A Level [ ]  
SSS [ ] University [ ]  
O’Level [ ] Other [ ]

Thank you.

**APPENDIX 4: TALLY SHEET FOR OPD DIARRHOEA RESEARCH**

DAYS	DIARRHEA DIAGNOSED		PRESCRIBED ORS		PRESCRIBED ANTIBIOTICS		PRESCRIBED ANTI DIARRHEAL AGENT		PRESCRIBED TONIC / VITAMIN		PRESCRIBED ANTIMALARIA AGENT	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												

## APPENDIX 5: STATISTICS

### 5.A Top cases seen at the OPD

Diseases	2002	2003	2004
Malaria	56.9	51.9	52.1
Diarrhoea	9.0	9.0	11.3
Acute Respiratory Tract Infection	9.0	7.7	12.8
Skin Diseases	10.4	8.9	10.2

SOURCE: PML HOSITAL 1<sup>ST</sup> 3QTRS REPORT, 2004

### 5.B Causes of death in children under-5 in Ghana

Distribution of causes of death among children under 5 years of age Ghana 2002-2003 (%) (%)		
Causes	Deaths <sup>b</sup>	Regional average
Total neonatal death	100%	100%
Neonatal causes <sup>a</sup>	28	26
HIV/AIDS	6	7
Diarrhoeal diseases	12	17
Measles	3	4
Malaria	33	17
Pneumonia	15	21
Injuries	3	2
Others	0	6

<sup>a.</sup> Includes diarrhoea during neonatal period

<sup>b.</sup> Sum of individual proportions may not add up to 100% due to rounding.

Source: World Health Statistics 2006

5.C PML CASE FATALITY (%). 1<sup>ST</sup> HALF YEAR 2003 AND 2004

DISEASE	2002	2003	2004
MALARIA	1.7	3.7	1.1
KWASHIOKOR	22.5	24.5	22.7
HIV	22.2	29.2	29.3
PNEUMONIA	3.7	5.0	8.7
DIARRHOEA	3.7	7.0	4.7

Source: PML Hospital 1<sup>st</sup> qtr report, 2004