



**PREVALENCE OF PNEUMONIA AND ASSOCIATED FACTORS IN CHILDREN
UNDER FIVE YEARS OF AGE ATTENDING PAEDIATRIC WARD
AT ISHAKA ADVENTIST HOSPITAL BUSHENYI DISTRICT**

BY

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**A RESEARCH REPORT SUBMITTED TO THE SCHOOL OF ALLIED HEALTH
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WESTERN CAMPUS**

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DECLARATION

I Rutehenda JohnBosco hereby declare that this research report has never been submitted or produced elsewhere for any academic purpose in any institution and is entirely a result of my research efforts.

Researcher's name: RUTEHENDA JOHNBOSCO.

Signature:

Date.....

DEDICATION

This research report is dedicated to my beloved parents Mr. and Mrs. Rutehenda , my wife Dinah , my brothers ,my sisters, lectures ,friends ,relatives and finally to my group discussion members.

ACKNOWLEDGEMENT

I give thanks to the almighty God for the gift of life that enabled me carry out this study. I have a special indebtedness to my beloved wife, my friends for their love and encouragement during the study. My sincere gratitude goes to the academic staff of KIU Western Campus for the knowledge and skills they provided me and especially to my supervisor Dr. Kyalema Samuel HOD A&E for the guidance, encouragement and counseling he offered me throughout the dissertation.

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ACRONYMS AND ABBREVIATIONS

AIDS: Acquired Immune Deficiency Syndrome.

HIV: Human Immune Deficiency Virus.

IAH: Ishaka Adventist Hospital.

ICU: Intensive Care Unit.

MOH: Ministry Of Health.

UPA: Uganda Pediatrician Association.

VHT: Village Health Team.

WHO: World Health Organization.

OPERATIONAL DEFINITIONS

Pneumonia is the inflammation of the parenchyma cells of lung tissue. Pediatric refers to a child between zero years to twelve years attending Ishaka Adventist Hospital.

Pediatric ward refers to a setting in Ishaka Adventist Hospital where children below twelve years are given health and its related services.

ABSTRACT

The study assessed the prevalence of pneumonia and associated factors in children under five years of age attending pediatric ward at Ishaka Adventist Hospital and the specific objectives were to establish prevalence of the children presenting with pneumonia among children, to identify the factors associated with occurrence of pneumonia in children under five and to review the clinical presentation of pneumonia in children of under five.

A descriptive questionnaire based cross sectional study was to be carried out in Ishaka Adventist hospital, whereby attendants of children of below five years but above 3 months on pediatric ward were requested to participate in the study. After a laboratory follow up and comparison with patients file will be done to confirm the diagnosis.

The study found out that, Children who participated in this study were 138, out of which 24(17%) had pneumonia, those who were most involved in this study were between age of 3months- 2years 98(71%). Also the highest age range of children with pneumonia were 3month- 2years 19(79%) and the most factors associated with pneumonia in this study were crowded houses 01(7%), dusty houses 02(8%), one was not fully immunized (7%) and parents' smoking was 01 (7%) and lastly the most clinical features presented in children who had pneumonia were cough 8(33%), flue 05(20.8%) and fever 04(16.7%).

In conclusion therefore, although different measures have been taken intervene in treatment of pneumonia, it is not enough and therefore the following are recommendations, health workers should health educate about the importance of immunization during antenatal so that after birth, mothers already know how to prevent pneumonia, during out reaches, health workers should advice parents on good ventilation, avoiding children to reach fire place where smoke can find them and lastly health workers should educate mothers/ caretakers on early signs and symptoms so that if seen in children, can be brought for treatment to avoid complication.

CHAPTER ONE

BACKGROUND OF THE STUDY

INTRODUCTION

Pneumonia is the term used to describe inflammation of the lung. It is a common illness that affects millions of people each year globally; (Garenne, *et al*, 2012). In children, pneumonia is the most important single cause of disease burden and a major cause of child mortality globally; (Lanata, *et al*, 2014). It is estimated that approximately 2 million children die each year due to pneumonia in developing countries; (Lanata, *et al*, 2003). Pneumonia, along with malaria and diarrhoea, are the leading causes of death in Ugandan children. Unpublished medical records from Siaya district show that diseases of the respiratory system are second to malaria as a cause of outpatient morbidity, while pneumonia in children ranks seventh; (Hassan M.K, 2011). Pneumonia is a leading cause of mortality among children under the age of five years globally [WHO, 2011]. The incidence of pneumonia in children under the age of five years is 0.29 episodes per child-year, which equates 151.8 million cases annually in developing countries, a further 4 million cases occur in developed countries. Fifteen countries contribute 74% of the world's annual pneumonia cases; (Gross P *et al* 2011).

Childhood pneumonia remains a leading killer of children in developing countries where it accounts for up to 21% of deaths in children under the age of five years. The mortality rates of children under the age of five years in most developing countries range from 60 to 100 per 1000 live births, one fifth of these deaths are due to pneumonia. An estimated 1.9 million children die from pneumonia yearly; [WHO, 2011]. Half the world's deaths due to pneumonia in children under the age of five years occur in Africa. In sub-Saharan Africa, the estimated proportion of death in children aged below 5 years attributed to pneumonia is 17-26%; [WHO, 2011]. Uganda is currently ranked among the 15 countries with the highest estimated number of deaths due to clinical pneumonia, the mortality rate being 50.3 per 10,000 under fives per year. In Uganda, pneumonia is the second leading cause of death among children under the age of five years and causes about 16% of deaths in the age group; (UMOH, 2010).

Pneumonia usually starts when the germs are inhaled into the lungs. Other diseases such as common cold or flu have been found to make individuals more susceptible to pneumonia. These results from the fact that they make it hard for the lungs to fight infection, so it is easier to get pneumonia. The risk factors include poverty, lack of measles immunization, indoor air pollution, overcrowding, malnutrition/poor nutritional practices, lack of excessive breast feeding and low birth weight; (Honicky R.E 2015). Other conditions that predispose people to pneumonia include having long-term or chronic diseases like Asthma; Heart disease; Cancer or Diabetes. Typical symptoms of pneumonia are cough or difficulty in breathing, chest pain (Morris K, et al 2010) nasal flaring with respiratory grunting and with or without fever. Pneumonia is diagnosed clinically by the presence of either fast breathing or lower chest wall in drawing; (Tupasi and Mangubat N.V, 2010). Wheezing is more common in viral infection. Very severely ill infants may be unable to feed or drink; convulsion, lethargy or unconsciousness and hypothermia. Pneumonia rates are greatest in children less than five years and adults older than 75 years (Pandey, M.R 2009) it occurs about five times more frequently in the developing world than the developed world (Selwyn B.J 2010). Viral pneumonia accounts for about 200 million cases; (Selwyn B.J 2010).

Only about one in five care-givers know the signs of pneumonia; only about half of children sick with pneumonia receive appropriate medical care; (Falade A.G 2012). According to the limited data available, less than 20% of children with pneumonia received antibiotics, the recommended treatment which costs less than \$1; (Armstrong J.R, 2011).The statement by UPA states while effective interventions to reduce pneumonia deaths are available, they reach few children;(Denny FW, 2007). Despite the death toll, the disease remains of low priority on the global health agenda and rarely receives attention; (Black R.E and Morris S.S 2013). This study therefore will provide information on the risk factors associated with pneumonia and associated clinical presentation so that its management can easily be addressed.

1.1 PROBLEM STATEMENT

In Uganda, it is the second leading cause of mortality, accounting for greater than 30,000 deaths in this age group annually. (Lanata C.F 2014) Pneumonia continues to be the leading cause of both morbidity and mortality for young children beyond the neonatal period and requires ongoing strategies and progress to reduce the burden further; (Campbell H, 2014).

However regardless of the fact that pneumonia has remained a health burden in children not enough literature is available on the risk factors contributing to pneumonia and its clinical presentation in children. Therefore this study is intended to bridge this gap.

1.3.0 STUDY OBJECTIVES

1.3.1 GENERAL OBJECTIVES

To determine the prevalence of pneumonia and associated factors in children under five years of age attending pediatric ward at Ishaka Adventist Hospital.

1.3.2 SPECIFIC OBJECTIVES

1. To determine prevalence of the children presenting with pneumonia among children under five years of age attending pediatric ward at Ishaka Adventist hospital.
2. To identify the factors associated with occurrence of pneumonia in children under five years of age attending Pediatric ward at Ishaka Adventist hospital.
3. To review the clinical presentation of pneumonia in children of under five attending pediatric ward at Ishaka Adventist Hospital.

1.3.3. RESEARCH QUESTIONS.

1. What is the prevalence of children presenting with pneumonia among children under five years of age attending pediatric ward Ishaka Adventist Hospital?
2. What are the factors associated with occurrence of pneumonia in children under five years of age attending pediatric ward Ishaka Adventist Hospital?
3. What is the clinical presentation of pneumonia in children of under five attending pediatric ward at Ishaka Adventist Hospital?

1.4 STUDY JUSTIFICATION

The epidemiology of childhood pneumonia in Uganda, an area of high malaria and HIV rates, remains poorly defined. Pneumonia contributes a lot towards childhood illnesses and pediatric admissions. Clinically, pneumonia in children ranges from mild to severe to fatal. Even in non-fatal cases, pneumonia is a significant economic burden on the health care system. To reduce the public health burden of pneumonia, preventive measures are needed to complement efforts directed at early diagnosis and improved case management. In order to develop preventive measures for the disease, epidemiological studies are needed to identify risk factors that are amenable to intervention. Although some studies have been done on the occurrence of pneumonia in Uganda, little literature is available on the factors associated with pneumonia in Bushenyi and Ishaka in particular and therefore this study was to help bridge this knowledge gap.

1.5 CONCEPTUAL FRAMEWORK.

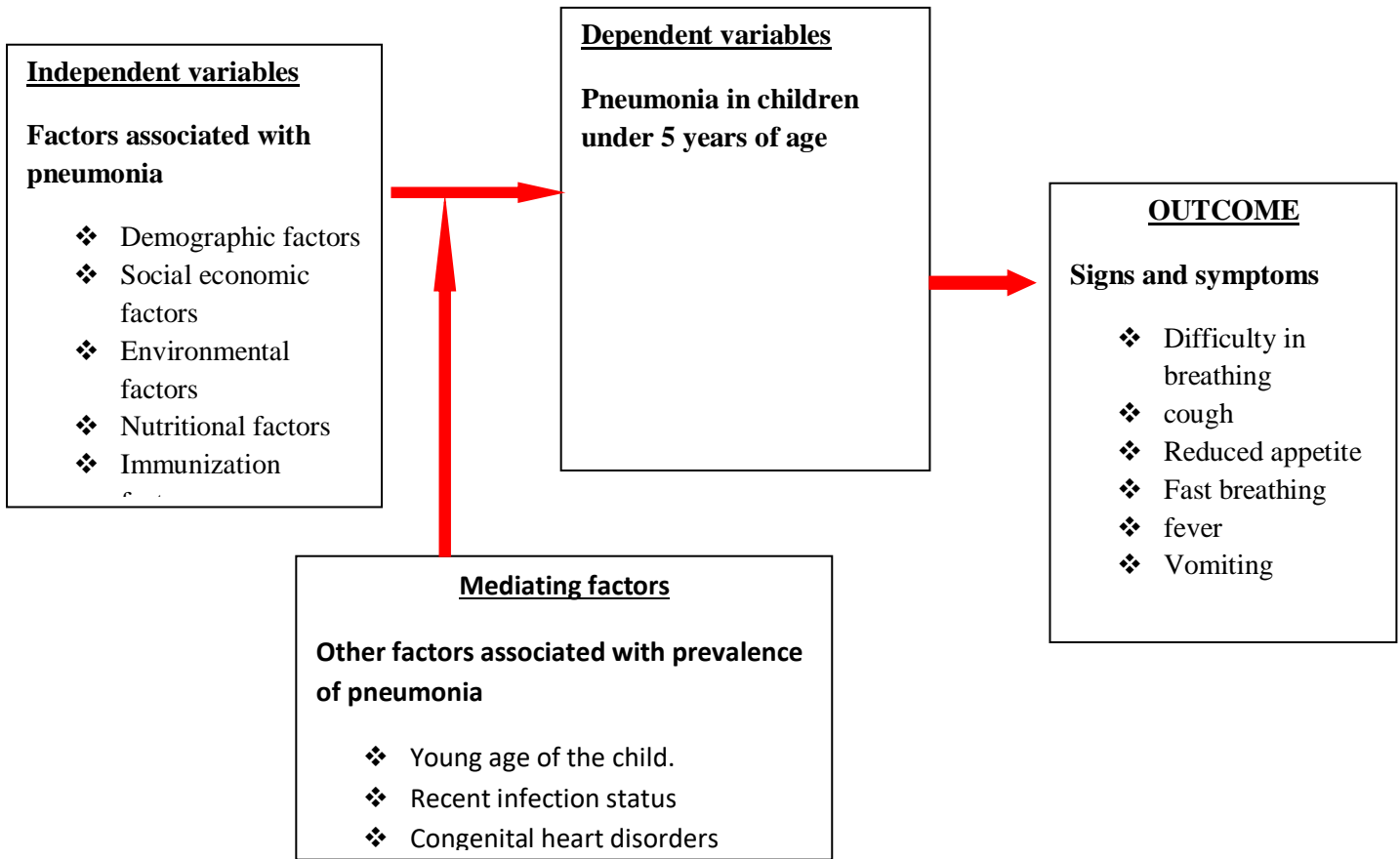


Figure 1 CONCEPTUAL FRAMEWORK

CHAPTER TWO: LITERATURE REVIEW

2.0 INTRODUCTION

This chapter discusses the existing literature on the study, in coloration with the specific objectives which are, to establish the prevalence of children presenting with pneumonia among children under five years of age attending Ishaka Adventist Hospital, to identify the risk factors associated with occurrence of pneumonia in children under five years of age attending Ishaka Adventist hospital and to review the clinical presentation of pneumonia in children of under five attending pediatric ward at Ishaka Adventist Hospital.

2.1 Prevalence of Pneumonia in under five year children.

The rate of new pneumonia infections is high among children aged less than five years worldwide. The 2015 Bulletin of World Health Organization reported that 0.26 episodes per child-year of pneumonia was estimated worldwide with the significant variation in the incidence of pneumonia across WHO regions; (WHO, 2015). The incidence of pneumonia infection estimated in developed countries by the same report to be only 0.05 episodes per child-year unlike the 0.29 episodes in developing countries, which can be translated to about 151.76 million deaths annually; (WHO, UNICEF, 2015).

However, this figure has reportedly fallen to 0.23 episodes per child-year in 2010; (Christa L et al 2013). More than 60% of such incidence of pneumonia is reportedly concentrated in just two regions, namely Southeast Asia and Africa, each bears 35 and 61 million new infections in a year 4, respectively. Walker et al found, in 2011, that there were 120 million new pneumonia infections worldwide, 14 million of which were sever enough to require hospitalization; (Walker et al 2011).

In Uganda ,there are very few studies carried out so far on the prevalence of pneumonia and its risk factors and, as well, with one or more methodological weakness. The latest nationwide research to date is the 2011 Uganda Demographic and Health Survey (UDHS, 2011) which estimated the national prevalence of pneumonia to be 9% with the significant variation across regions. The average estimate may hide the probably high prevalence of pneumonia in the rural community. The percentage of children aged less than five years with pneumonia in southwestern Uganda reported to reach 6.4%. A focused local community based cross sectional study done in

Kisoro in 2014 found that the prevalence was as high as 9%. This study, however, suffered from a small sample size and, again, the ascertainment is based on mothers or care takers' report like with the UDHS findings.

2.2 Associated Factors for Pneumonia

Studies have shown that pneumonia is influenced by demographic, socio-economic, environmental, nutritional, behavioral groupings, birth weight, and vaccination status of the children.

2.4.1 Demographic risk factors

In a number of community-based studies, boys appear to be more frequently affected by pneumonia than girls; (Tupasi, T.E and Mangubat, 2010). The excess risk for boys was confirmed in a pneumonia case control study from Brazil; (Macleod J, 2007). Younger age of the children (2-6 months) was found to be a significant risk factor for pneumonia; (Smith T.A, 2011)

2.4.2 Socio-economic Risk Factors

An indication that pneumonia is associated with socio-economic factors is demonstrated by the pronounced differences in incidences between countries. The annual incidence of pneumonia ranges from 3% to 4% in industrialized countries and 10% to 20% in developing countries; (Selwyn B.J 2010.). Pandey and others found that poor economic status of parents was associated with a nearly fivefold increased risk of pneumonia; (Pandey, *et al*, 2009).

Low educational levels in mothers are associated with an increased risk of pneumonia hospitalisation and mortality; (Morris K, 2010). In a childhood pneumonia case-control study in Brazil, the father's education was more strongly correlated than the mother's when both variables were included in an explanatory model; (Roth, A et al 2015).

1.2.4.3 Environmental Risk Factors.

The most frequently studied environmental risk factors for respiratory infections include exposure to smoke, crowding, and exposure to extreme cold settings.

Environmental tobacco smoke: Cigarette smoke contains measurable quantities of carbon monoxide, ammonia, nicotine, hydrogen cyanide, particulates, and a number of carcinogens. The association between environmental tobacco smoke, often referred to as passive smoking, and respiratory illness in childhood has been clearly established by a large number of studies; (Falade A.G, 2012). Children of smokers do not perform as well in pulmonary function tests and show 1.5-2.0 times greater incidence rates of pneumonia than those of non-smokers; (Armstrong, J.R, 2011).

Domestic Biomass Pollution: The high costs and limited availability of electricity and fossil fuels in many developing countries lead to frequent domestic use of biomass fuels, including wood, manure, and agricultural waste. It is estimated that in developing countries, 30% of urban households and 90% of rural ones use biomass fuels as the major source of energy for cooking and heating; (Denny F.W , 2007). These are usually burned under inefficient conditions and often without any type of chimney. Particulate levels in these homes are about 20 times greater than in developed countries; (Black R.E, 2013). Studies from Nepal (Chandra K.R, 2008) have reported higher respiratory morbidity among young children exposed to indoor pollution. Other studies have found that the use of unprocessed solid fuels in the household is an indicator of potential for excessive air pollution exposures; (Brown K.H and Solomon N.W 2011). Crowding, which is notably common in developing countries, contributes to the transmission of infections through respiratory droplets and has been clearly shown to be associated with respiratory infections; (Choo S and Finn A, 2011). Variables strongly associated with crowding, such as birth order ;(Lang, *et al* 2014) and the number of children under 5 in the household; (Graham, N.M, 2010), are also associated with the risk of lower respiratory infections. Lanata, *et al*, 2014; found that while household crowding placed young children at increased risk of pneumonia, it may protect against asthma; (Lanata, *et al*, 2014). Some studies (Gross, P.A, 2011; Hassan *et al*, 2011) showed that after adjustment for socio-economic and environmental factors, the presence of three or more children under 5 in the household was associated with a 2.5-fold increase in pneumonia mortality. In the developing world, where urbanisation has been rapid in recent years with lack of intervention in the

housing market, a large proportion of the population is still living in conditions similar in many aspects as those of the nineteenth century London. Overcrowding, inadequate arrangements for excreta and waste disposal, poor ventilation, dampness, and numerous other housing problems remain threats to health of low-income groups; (Lanata, *et al*, 2014)

2.4.4 Nutritional Factors

Nutritional factors that may influence the risk of pneumonia include birth weight, malnutrition, breast-feeding, and levels of vitamin A and other micronutrients.

Malnutrition: Protein-energy malnutrition results from inadequate intake, poor utilization of calories or protein in the diet, or from childhood infectious diseases, such as diarrhea and pneumonia; (Macleod J, 2007). In epidemiological studies, malnutrition is usually assessed using anthropometrical measurements. A number of studies have examined the relationship between malnutrition, particularly low weight-for-age, and the incidence of pneumonia; (Tupasi T.E, 2010). Taken together, studies, which used -2 Z scores as the cut-off, found a 2- to 4-fold increase in pneumonia among malnourished children. However, these cut offs may have to be re-examined for use in different populations; (Morris K, 2010).

There is overwhelming evidence that severely malnourished children have impaired immunological response; (Smith T.A and Lehman D, 2011). An analysis of ten longitudinal community based studies of children younger than five years showed that being underweight conferred an additional risk of mortality from infectious diseases. The fraction of disease attributable to being underweight was 53% for pneumonia. Foetal malnutrition, manifested in low birth weight, might contribute in a similar way to neonatal mortality; (Puli V, and Clerke S.C, 2012).

Lack of breastfeeding: The frequency of breastfeeding varies markedly among developing countries. Whereas among the rich and some poor areas median durations are short (about three months), in many poor rural areas and some poor urban areas breast-feeding is universal until 12-18 months, although the supplements are often introduced early in life. Selwyn found that supplementation of the breast milk with solids was associated with a relative risk of 13.4 for pneumonia in all infants (Selwyn BJ 2011). Other studies have shown that infants not breast-fed had 1.5 to 4 times greater risk of being admitted for pneumonia; (Pandey M.R, et al 2009). Infants aged 0-5 months who are

not breast-fed have five-fold increased risks of deaths from pneumonia. Six to eleven months –old infants who are not breastfed also have an increased risk of such deaths; (Cesar J.A et al 2011).

2.4.5 Immunization factors

Childhood immunizations are protective against childhood illness. Roth and others found that a Bacille Calmett-Guerin (B.C.G) was a marker of better survival among children in countries with high child mortality; (Armstrong J.R, 2011). The conjugate *Haemophilus influenzae* type B (HiB) vaccine has been highly efficacious in reducing type b *H. influenzae* meningitis. HiB might also be responsible for 20-25% of severe pneumonia; (Falade A.G, 2012). Andrade *et al* found that under programme conditions the effectiveness of HiB conjugate vaccine in infants with radiologically confirmed pneumonia was 31% (95% CI: 9%-57%) showing the potential benefit of HiB immunization in the prevention of likely non-bacteraemic pneumonia; (Black R.E, 2013). Pneumococcal polysaccharide vaccines were first licensed in the USA in 1946, but were soon withdrawn from the market when penicillin and sulphonamides became available. New pneumococcal conjugates are now being tried. Results from the immunogenicity studies and efficacy trials are very encouraging. Pneumococcal vaccines are safe and immunogenic in infants and induce immunological memory. They induce mucosal immune responses and reduce carriage, and their widespread use should result in herd immunity; (Denny F.W, 2007). Some of complications of measles infection include pneumonia; therefore measles vaccine can be used for prevention of pneumonia in children.

2.3 Clinical Presentation of Pneumonia

Acute pneumonia presents with a short history of systemic disturbance. The onset is sudden, often with rigors, or with vomiting or a convulsion in children. The temperature rises in a few hours to 39-40°C. Loss of appetite, headache, and aching pains in the body and limbs accompany the pyrexia. Localized pain of pleural type in the chest wall often develops at an early stage in the illness. Respiration is rapid (50-60 in children) and shallow when pleural pain is present. The pulse is rapid. Cough is not a marked feature in children. Signs include a flushed miserable and pyrexial child. There may be laboured respiration with grunting or more subtle flaring of the nostrils and tachypnoea with intercostal recession. Signs of consolidation should be detected in older children,

but in infants are often hard to define. Meningism may be present and shoulder tip or abdominal pain can also divert attention from the correct diagnosis; (Christa L, et al 2013).

The diagnosis of pneumonia is usually made on clinical features according to the W.H.O criteria. Several studies have shown that fast breathing and lower chest wall in drawing are the best predictors of pneumonia in children with cough or breathing difficulties; (Fischer Walker, 2008). A child with tachypnoea with no chest in drawing or difficulty in feeding is also labelled as pneumonia; (Rudan I, et al 2008). Presence of chest in drawing, difficulty in speech, feeding or cyanosis classifies a child as suffering from severe or very severe pneumonia; (RipaChakma and DekiPem, 2011). Other clinical findings like the presence of crackles and rhonchi on auscultation assist in the diagnosis of pneumonia. Diagnostic tools include x-rays <http://en.wikipedia.org/wiki/X-ray> and examination of the sputum.

However in many incidences the clinical presentation of childhood pneumonia varies depending upon the responsible pathogen, the particular host and the severity. The presenting signs and symptoms are nonspecific; no single symptom or signs are path gnomonic for pneumonia in children; (Macleod J, 2007).

Symptoms and signs of pneumonia may be subtle, particularly in infants and young children. The combination of fever and cough is suggestive of pneumonia, other respiratory findings (e.g. tachypnoea, increased work of breathing) may precede cough. The longer fever, cough and respiratory findings are present, the greater the likelihood of pneumonia, neonates and young infants may presents with difficult feeding, restlessness or fussiness; (Smith T.F, 2010).

CHAPTER THREE: METHODOLOGY

3.1 STUDY AREA

The study was carried out in Ishaka Adventist Hospital located in the town of Ishaka, Bushenyi District, Western Uganda. It is located immediately north of the junction of the Ishaka-Rukugiri Road with the Mbarara-kasese Road. Its location is approximately 77 kilometers (48 miles), by road, west of Mbarara, the largest city in the sub-region. (Road distance between Mbarara and Ishaka with map) This location lies approximately 360 kilometers (224 miles), by road, southwest of Kampala

The area has wet and dry climate (seasons) there are two wet seasons running from February to June and from July to November, The population here is composed of different tribes but the most common is Banyankole by tribe, The most economic activities done here are small scale retail shops, small scale mini supermarkets small scale marketing and small scale farming. However there are other activities like trade in addition to agriculture (plantation, animal husbandry, and fishing).

3.2 STUDY POPULATION

The study was done among children under five years of age in Ishaka Adventist Hospital confirmed of having pneumonia. Both out patients and those who were admitted qualified for inclusion in the study.

3.3. STUDY DESIGN

A descriptive questionnaire based cross sectional study was be carried out in Ishaka Adventist hospital, whereby attendants of children of below five years but above 3 months on paediatric ward will be requested to participate in the study. After a laboratory follow up and comparison with patients file was done to confirm the diagnosis.

3.4 SAMPLE SIZE DETARMINANTION

Sample size was determined by using fisher formula:

$$s = \frac{Z^2 PQ}{d^2}$$

Where S= Sample size

Z= standard Deviation at required degree of accuracy which at 90% which gives 1.96

P= already known prevalence from other studies (90%) (UDHS,2014).

Q= 1-P

d = degree of error you are able to accept.

$$s = \frac{1.96)^2 * 0.9(1 - 0.9)}{0.05^2}$$

S= 138.

3.7 INCLUSION CRITERIA

All children above 3months and under five years of age attending in Ishaka Adventist Hospital qualified for recruitment in the study.

3.8 EXCLUSION CRITERIA

All children below 3 months whose investigational report ruled out pneumonia.

All children above five years of age whose investigational report ruled out pneumonia.

Children who are critically ill and need emergency care.

Mothers who failed to consent for the study.

3.9 DATA COLLECTION METHOD

Data will be collected using questionnaires which were filled by the patient's Guardian/attendants.

In this study some information was obtained from hospital records.

3.10 DATA ANALYSIS

Then collected data was analyzed using computer programs such as Microsoft excels, latest version of SPSS or Mendeley and by also using calculators during computation of simple mathematics.

3.12 DATA QUALITY CONTROL

Pre-test

To ensure quality control, the researcher prior to the exercise was conducted one day training for three research assistants who thereafter were set for field testing of the study tools in another area apart from Ishaka total of six questionnaires were distributed for pre-test.

3.13 ETHICAL CONSIDERATION

An introductory letter obtained from school administration was presented to Executive Director of the hospital through District Health Officer to allow me conduct a study in their area. Before studying, an informed consent form was sought from the participants who gave their consent after full complete and truthful information is given.

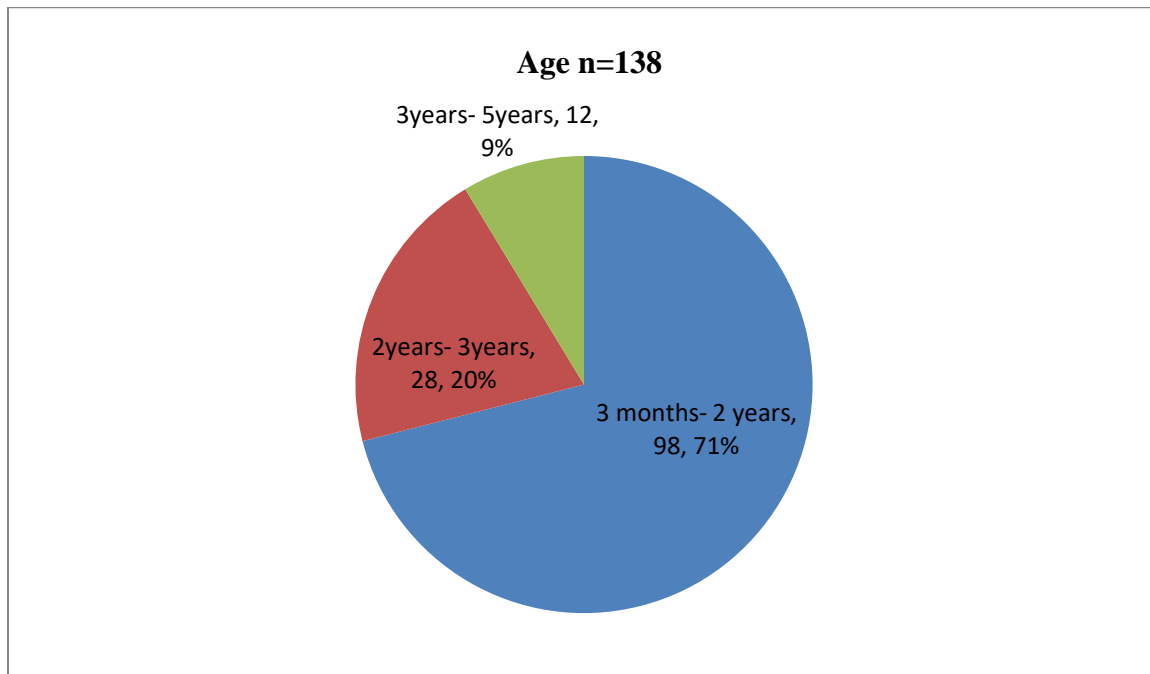
CHAPTER FOUR

RESULTS

4.0 Introduction

This chapter contains findings from the study in line with specific objectives, these were to determine the proportion of children under five years with pneumonia, to identify the factors predisposing to pneumonia and to review clinical presentations of pneumonia in under five year children attending Ishaka Adventist Hospital Bushenyi.

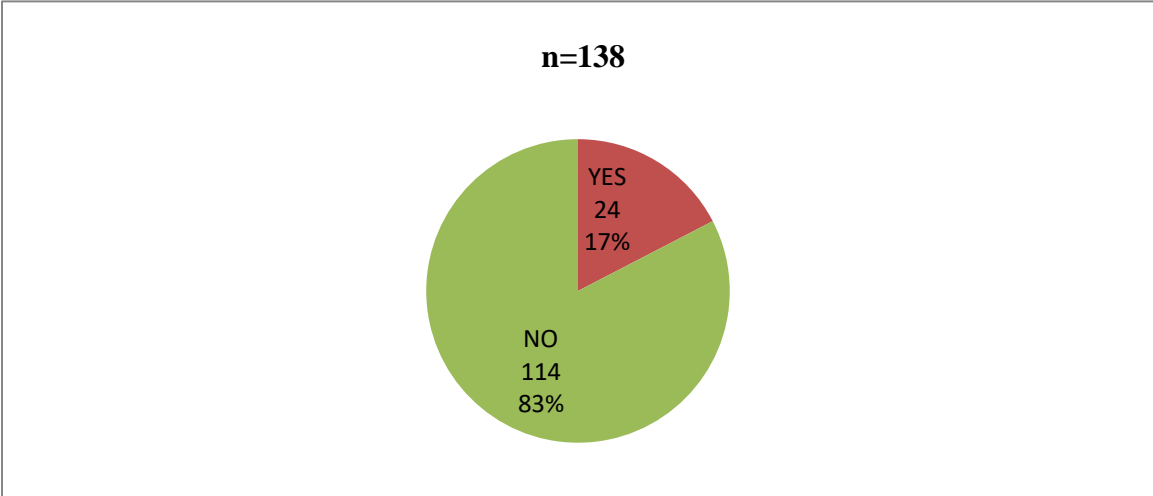
Figure 2 Age of children in the study.



From the figure above, Majority of participants were aged between 3months- 2years 98(71%), followed by those of years between 2years- 3years 28(20%) and the minority were between 3years- 5years 12(9%).

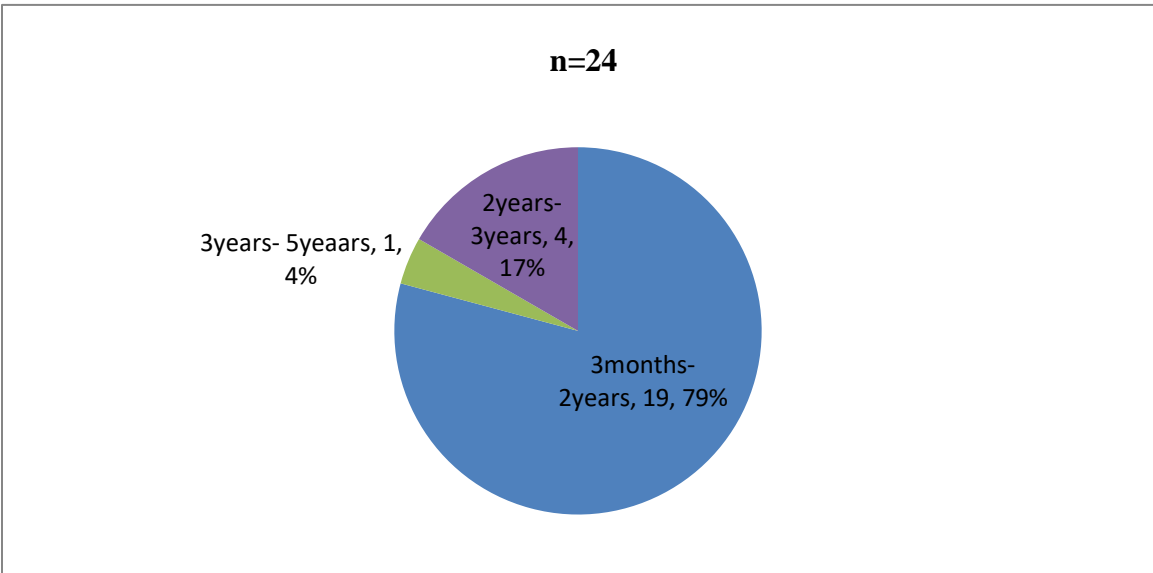
4.2 Prevalence of Pneumonia in under five years children.

Figure 3 Proportion of children with pneumonia.



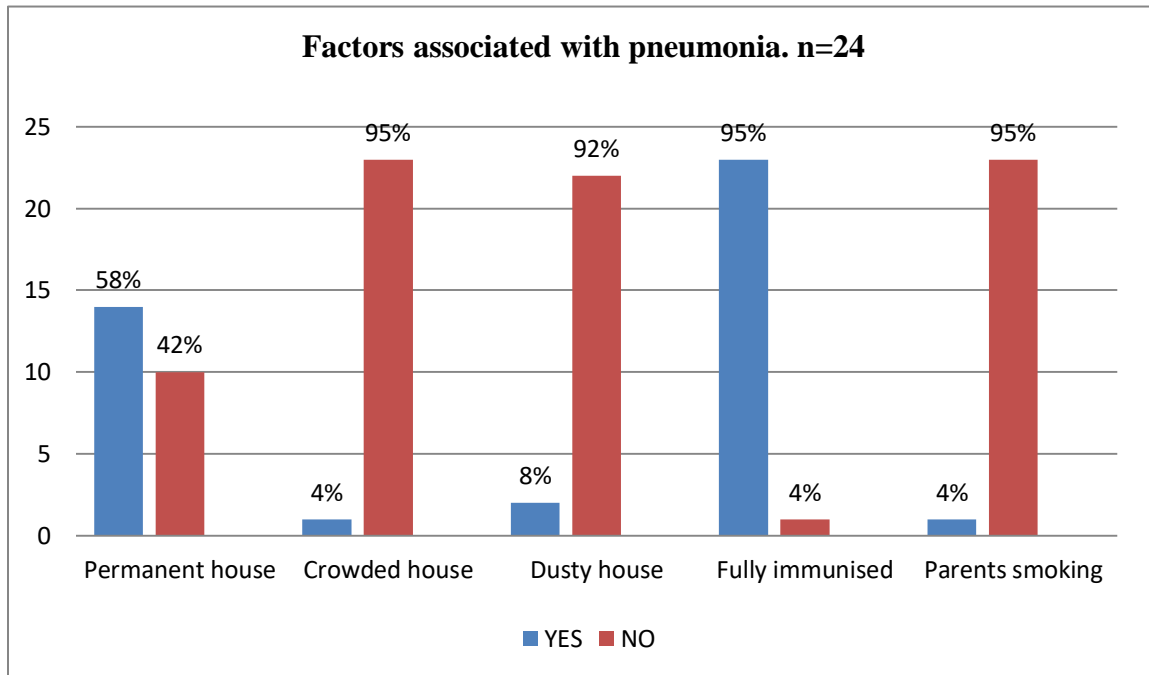
From the figure above, the majority did not have pneumonia 114(83%) and 24(17%) were the ones found with pneumonia

Figure 4 Age of children with pneumonia.



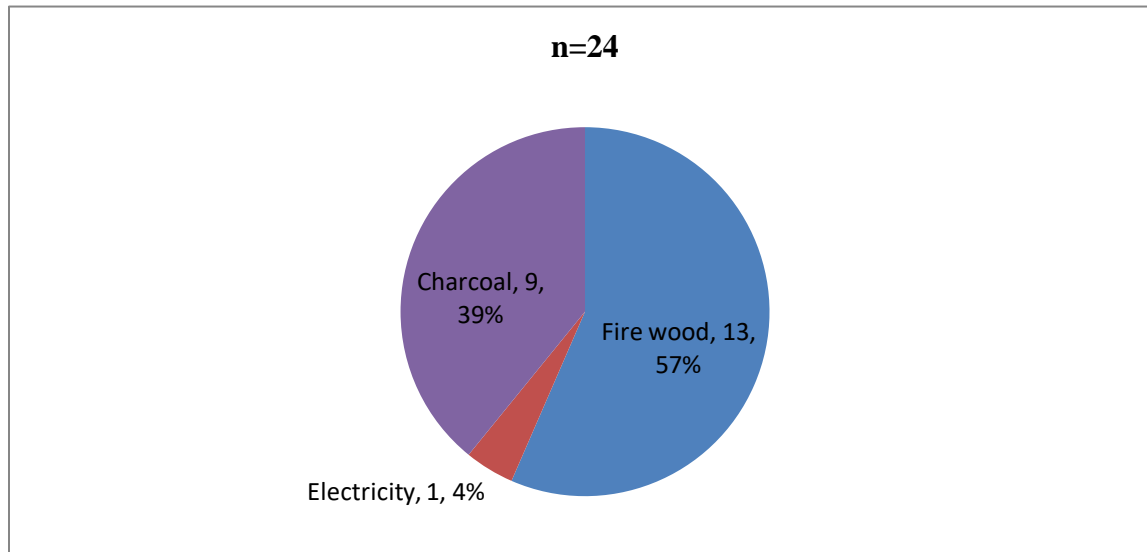
From the figure above, the age group which was most affected was between 3month- 2years 19(79%), followed by 2years- 3years 4(17%) and minority were between 3years- 5years 1(4%).

Figure 5 Factors associated with pneumonia in children under five.



From the above figure, it was found out that 14(58%) of the care givers of children said they had permanent house while 10(42%) did not have permanent house, also 01(4%) of the caregivers said they live in crowded house with their children while 23(95%) said they lived in uncrowded house, 02(8%) acknowledged that they lived in a dusty house while 22(92%) said they lived in not a dusty house, 23(95%) said their children were fully immunized while 01(4%) were of the children were not fully immunized, 01(4%) of the care givers said they were smokers while 23(95%) of the care givers said that they were not smokers.

Figure 6 Cooking materials



From the figure above, majority of the caretakers were using firewood for cooking 13(57%), followed by those who were cooking using charcoal 9(39%) and only one was using electricity 1(4%).

Table 1 Clinical features of Pneumonia.

Sign	Variable	Percentage
Unable to breast feed	01	4%
Vomiting	01	4%
Difficulty in breathing	02	8%
Cough	08	33%
Flue	05	20.8%
Fast breathing	03	12.5%
Fever	04	16.7%

From figure above, about children who had pneumonia 01(4%) had had history of unable to breastfeed, 01(4%) had experienced vomiting, 02(8%) had had difficulty in breathing, 08(33%) were had had cough, 05(20.8%) had had flue, 03(12.5%) had had fast breathing and 04(16.7%) had experienced fever.

CHAPTER FIVE

DISCUSSION

5.0 Introduction

This chapter contains the discussion of results, recommendations made and the conclusion drawn about the study.

5.1 Age of children in the study.

Majority of participants were aged between 3months- 2years 98(71%), followed by those of years between 2years- 3years 28(20%) and the minority were between 3years- 5years 12(9%). These study findings show that most of the children who were involved in the study were between 3 months to 2 years (71%). These are age groups of children who are susceptible to many illnesses.

5.2 Prevalence of Pneumonia is less between 3-5 years children.

5.2.1 Proportion of children with pneumonia.

The majority did not have pneumonia 114(83%) and 24(17%) were the ones found with pneumonia, this was a higher prevalence given the 17% prevalence, it is higher than the previously recorded findings because according to the Uganda Demographic and Health Survey UDHS, 2011. The latest nationwide research to date is the 2011 which estimated the national prevalence of pneumonia to be 9% with the significant variation across regions. The average estimate may hide the probably high prevalence of pneumonia in the rural community. The percentage of children aged less than five years with pneumonia in southwestern Uganda reported to reach 6.4%.

5.2.2 Age of children with pneumonia.

The age group which was most affected was between 3month- 2years 19(79%), followed by 2years- 3years 4(17%) and minority were between 3years- 5years 1(4%). This study shows that children between 3month to 2 years are most affected by pneumonia, this is because they have low immunity and are exposed to predisposing factors for pneumonia, this study shows correlation with a study by

Smith T.A in 2011 although he had put it at even an earlier age, younger age of the children (2-6 months) was found to be a significant risk factor for pneumonia

5.3 Descriptive factors associated with pneumonia in children under five.

Concerning factors associated with pneumonia, it found out that 14(58%) of the care givers of children said they had permanent house while 10(42%) did not have permanent house, also 01(4%) of the caregivers said they live in crowded house with their children while 23(95%) said they lived in uncrowded house, 02(8%) acknowledged that they lived in a dusty house while 22(92%) said they lived in not a dusty house, a related study outcome was observed in a study by Lanata, *et al in* 2014 who indicated that crowded and dusty houses are usually associated with pneumonia. Overcrowding, inadequate arrangements for excreta and waste disposal, poor ventilation, dampness, and numerous other housing problems remain threats to health of low-income groups.

Concerning immunization status of children, 23(95%) said their children were fully immunized while 01(4%) were of the children were not fully immunized; immunization by pneumococcal conjugated vaccine gives prior immunity to a baby to reduce pneumonia. As Denny F.W, in 2007 explains that Pneumococcal polysaccharide vaccines were first licensed in the USA in 1946, but were soon withdrawn from the market when penicillin and sulphonamides became available. New pneumococcal conjugates are now being tried. Results from the immunogenicity studies and efficacy trials are very encouraging. Pneumococcal vaccines are safe and immunogenic in infants and induce immunological memory. They induce mucosal immune responses and reduce carriage, and their widespread use should result in herd immunity.

Another important finding was that 01(4%) of the care givers said they were smokers while 23(95%) of the care givers said that they were not smokers, smoke has been associated with pneumonia in children a related study by Armstrong, J.R in 2011 explained that Cigarette smoke contains measurable quantities of carbon monoxide, ammonia, nicotine, hydrogen cyanide, particulates, and a number of carcinogens. The association between environmental tobacco smoke, often referred to as passive smoking, and respiratory illness in childhood has been clearly established by a large number of studies. Children of smokers do not perform as well in pulmonary function tests and show 1.5-2.0 times greater incidence rates of pneumonia than those of non-smokers.

5.3.2 Cooking materials

Also on predisposing factors to pneumonia, majority of the caretakers said they were using firewood for cooking 13(57%), followed by those who were cooking using charcoal 9(39%) and only one was using electricity 1(4%). Children who are fond of being in kitchen with smoke have higher chances of developing pneumonia than those not exposed to smoke. Chandra K.R, 2008. Studies from Nepal have reported higher respiratory morbidity among young children exposed to indoor pollution

5.4 Clinical features of Pneumonia.

About children who had pneumonia 01(4%) had had history of unable to breastfeed, 01(4%) had experienced vomiting, 02(8%) had had difficulty in breathing, 08(33%) were had had cough, 05(20.8%) had had flue, 03(12.5%) had had fast breathing and 04(16.7%) had experienced fever. Symptoms and signs of pneumonia may be subtle, particularly in infants and young children. This study shows that the commonest sign of pneumonia was cough, and first breathing. This is because is a disease of respiratory system in which the bronchi and the lungs are fluid fluid leading to difficulty in breathing, in relation to other studies according to Smith T.F, in 2010 the combination of fever and cough is suggestive of pneumonia, other respiratory findings (e.g. tachypnea, increased work of breathing) may precede cough. The longer fever, cough and respiratory findings are present, the greater the likelihood of pneumonia, neonates and young infants may presents with difficult feeding, restlessness or fussiness;

5.5 CONCLUSION

The following conclusions have been made according to the study

- Children who participated in this study were 138, of which 24(17%) had pneumonia.
- Children who were most involved in this study were between age of 3months- 2years 98(71%).
- In this study, the highest age range of children with pneumonia were 3month- 2years 19(79%).
- The most factors associated with pneumonia in this study were crowded houses 01(7%), dusty houses 02(8%), one was not fully immunized (7%) and parents' smoking was one (7%).

- The most clinical features presented in children who had pneumonia were cough 8(33%), flue 05(20.8%) and fever 04(16.7%).

5.6 RECOMMENDATION

The study recommends that;

- Health workers should health educate about the importance of immunization during antenatal so that after birth, mothers already know how to prevent pneumonia.
- During out reaches, health workers should advice parents on good ventilation, avoiding children to reach fire place were smoke can find them.
- Health workers should educate mothers/ caretakers on early signs and symptoms so that if seen in children, can be brought for treatment to avoid complication.

REFERENCE

Armstrong, J.R., Campbell, H., (2011). Indoor air pollution exposure and lower respiratory infections in young Gambian children. *Int. J Epidemiol*, 20:424-429.

- Black, R.E., Morris, S.S., and Bryce, J., (2013). Where and why are 10 million children dying every year? *Lancet*, 361:2226-34.
- Brown, K.H. and Solomons, N.W., (2011). Nutritional problems of developing countries. *Infect Dis Clin N Am*, 5(ii) 297-317
- Cesar, J.A., Victora, C.G., Barros, F. C, Santos, I. S. and Flores, J.A., (2011). Impact of breast feeding on admission for pneumonia during post neonatal period on Brazil: nested case-control study. *BMJ*, 318:1316-1320
- Chandra, K.R., (2008). Nutrition and immunity lessons from the past and new insights into the future. *American journal of clinical nutrition*, 53:1087-1101
- Choo, S., Finn, A., (2011). Current topic: New pneumococcal vaccines for children. *Arch. Dis. Child.*, 84:289-294
- Christa L Fischer Walker, Igor Rudan, Li Liu, Harish Nair, EvropiTheodoratou, Zulfiqar A Bhutta *et al.* Childhood Pneumonia and Diarrhoea : Global burden of childhood pneumonia and diarrhoea . *Lancet* 2013; 381: 1405–16
- Denny, F.W., (2007). Acute respiratory infections in children: Etiology and epidemiology. *Pediatric Rev*, 9:135-146
- Falade, A.G, (2012). Use of simple clinical signs to predict pneumonia in young Gambian children: the influence of malnutrition. *Bulletin of the World Health Organization*, 73(3): 299-304
- Fischer Walker CL, Perin J, Aryee MJ, Boschi-Pinto C, Black RE. Diarrhea incidence in low- and middle-income countries in 2008 and 2010: a systematic review. *BMC Public Health* 2012; 12: 220.
- Garenne, M., Ronsmans, C., and Campbell, H., (2012). The magnitude of mortality from acute respiratory infections in children under 5 years in developing countries. *Bulletin of world Health Organization*, 45: 180-91

- Graham, N.M.H., (2010). The epidemiology of acute respiratory infections in children and adults: A global perspective. *Epidemiol. Rev*, 12:149-178
- Gross, P. A., (2011). Vaccines for pneumonia and new antiviral therapies. *Med Clin North Am*, 85:1367-79
- Hassan, M.K. and Al-Sadoon, I., (2011). Risk factors for severe pneumonia in children in Basrah. *Trop Doct*, 31(3):139-41
- Honicky, R.E., Osborne, J.S. and Akpom, C.A., (2015). Symptoms of respiratory illness in young children and the use of wood burning stoves for indoor heating. *Pediatrics*, 75:587-593
- Lanata, C.F., Rudan, I., Boschi-Pinto, C., Tomaskovic, L., Cherian, T., Weber, M. and Campbell, H., (2014). Methodological and quality issues in epidemiological studies of acute lower respiratory infections in children in developing countries. *International Journal of Epidemiology*, 33:1362-1372
- Lang, T., Lafaiz, C., Fassin, D., Arnaut, I., Salmon, B., Baudon, D. and Ezekiel, J., (2006). Acute respiratory infections: A longitudinal study of 151 children in Burkina Faso. *Int J Epidemiol*, 15:553-560
- Lange, P., Vestbo, J. and Nyboe, J., (2009). Risk factors for death and hospitalisation from pneumonia: A prospective study of a general population. *Eur Respir J*, 8:1694-1698
- Macleod, J., (2007). Davidson' Principles and Practice of Medicine, fifteenth edition. Longman group U.K Ltd, 220-230
- Morris, K., Morganlander, M., Coulehan, J.L, Gahagen, S. and Arena, V.C., (2010). Wood burning stoves and lower respiratory tract infection in American Indian children. *Am J Dis Child*, 144:105-108
- Munyaneza A, Abeje, Mamo Wubshet, Mujira Asres. Prevalence of pneumonia among under- five children in Kisoroperi Urban and the surrounding rural areas, Southwest Uganda;

- Pandey, M.R., Boleij, J.S.M., Smith, K.R. and Wafula, E.M., (2009). Indoor air pollution in developing countries and ARI in children. *Lancet*, i: 427-429..
- Puli, V. and Clarke, S.C., (2012). Clinical aspects of pneumonia. *British Journal of Biomedica*
- Ripa Chakma and DekiPem. Students' handbook on Integrated Management of Childhood Illness. Hand book on IMNCI, Department of Public Health, Ministry of Health. Thimphu, 2011.
- Roth, A., Gustafson, P., Nhaga, A., Djana, Q., Poulsen, A., Garly, M., Jensen, H., Sodemann, M., Rodrigues, A. and Aaby, P., (2015). BCG vaccination scar associated with better childhood survival in Guinea-Bissau. *International Journal of Epidemiology*, 34:540-547
- Rudan, I., Boschi-pinto C, Bilgola Z, Mulholland K, Campbell H. Epidemiology and etiology of childhood pneumonia. *Bulletin World Health Organization* 2008;86:408-16
- Selwyn, B.J., (2010). The epidemiology of acute respiratory tract infection in young children: Comparison of findings from several developing countries. *Rev Infect Dis*, 12:S870-S888.
- Smith, T.A., Lehman, D., Coakley, C., Spooner, V., and Alpers, M.P., (2011). Relationships between growth and acute lower respiratory infections in children aged less than 5 years in a highland population of Papua New Guinea. *American Journal of Clinical Nutrition*, 53:963-970.
- The United Nation Children's Fund Pneumonia: the forgotten killer of children. WHO, 2016.
- Tupasi, T.E., Mangubat, N.V., Sunico, E.S., et al (2010). Malnutrition and acute respiratory tract infections in Filipino children. *Rev Infect Dis*, 12:S1047-S1054.
- World Health Organization and UNICEF. Handbook: IMCI, Integrated management of childhood illness. Geneva: WHO, 2015
- World health organization and UNICEF. Pneumonia and diarrhea tackling the deadliest diseases for the world' poorest children. UNICEF/WHO, June 2012

APPENDIX I. CONSENT FORM

I am Rutehenda JohnBosco a student at Kampala International University carrying out a research project for the award of Diploma in Clinical medicine. The research aims to determine the prevalence of pneumonia and associated factors in children below five years. I kindly request your

help in this process. Your participation is voluntary and the information you give is confidential. You may also stop the interview at any time you wish. I hope that this information will be used in improving the welfare of our children. Your contribution is highly appreciated.

APPENDIX II. QUESTIONIER

SECTION A: Demographic data and predisposing factors to pneumonia.

A1. FOR CHILDREN

1. Age of the children

A. 3months and 1 year

B. 2years and 3 years

C. 4years-5 years

A2. DEMOGRAPHIC CHARACTERISTICS OF CAREGIVER

2. Education level: primary secondary tertiary none

3. Occupation; Peasant student Business man/women house wife

Other specify.....

4. Marital status: single married separated divorced others
(specify).....

SECTION B: Factors predisposing children under 5 years to pneumonia:

1. Do you stay in a permanent house well ventilated?

a. Yes

b. No

2. Where do you like staying with your child?

a) market place

b) school

c) Crowded places

d) Groups of children

3. While at home, are they always necked or covered with clothing?

a) Necked

b) Covered with clothing

If necked when are they always necked?

a) Stay necked everyday

b) Stay necked all the time

c) Every morning

d) Every evening

4. Where do they always play?

a) Dusty place

b) Not dusty place

c) Still young

5. Is your child fully immunized against all the immunisable diseases including measles and tuberculosis?

a) Yes

b) No

6. Do you smoke? Is there any person staying with a child who smokes?

Yesno..... (Tick appropriately)

7. What do you use for cooking at home?

a) Charcoal

b) Fire wood

c) Gas cooker

d) Electricity

SECTION: CLINICAL PRESENTATION PNEUMONIA.

HAS YOUR CHILD EXPERIENCED ANY OF THE FOLLOWING SIGNS?

SIGN	TICK IF APPLICABLE.
------	---------------------

Unable to breast feed or drink	
Vomiting	
Difficulty in breathing	
Cough	
Fast breathing	
Fever	
Others specify

FROM PATIENTS FILE RECORD

PNEUMONIA DIAGNOSIS FO THE CHILD	POSITIVE	NEGATIVE
(TICK)

APPENDIX III. WORK PLAN

PROPOSED TIME TABLE FOR THE RESEARCH.

S/N	ACTIVITIES	APRIL- MAY	MAY- JUNE	JUNE-SEPT		SEPT- DEC.	
1	Selection and approval of the topic						
2	Picking a letter for supervisor and presentation of chapter one.						
3	Reviewing literature and writing chapter two.						
4	Proposal writing						
5	Data collection and report writing						
6	Submission of report and defending						

APPENDIX IV: BUDGET

ITEM	QUANTITY	UNIT COST	STOTAL AMOUNT
Photocopying ream	1	15000	15,000/=
Pens	2	500/=	1,000/=
Typing and printing	500	100/= @paper	50,000/=
Airtime	10	1000/=	10,000/=
Binding	4	1500/=	6,000/=
Miscellaneous		20000/=	20,000/=
TOTAL			102,000/=

APPENDIX V: A MAP OF UGANDA SHOWING STUDY AREA.

APPENDIX VI: A MAP OF BUSHENYI DISTRICT SHOWING LOCATION OF ISHAKA ADVENTIST HOSPITAL.



APPENDIX VII: THE INTRODUCTORY LETTER



School of Allied Health Sciences (SAHS) - Uganda
 P.O. Box 111, Bushenyi
 Tel: 0792061022
 Web: www.kiu.ac.ug

SAHS-RESEARCH UNIT

28th September 2017

*Dr. Brian / Matron,
 Could you allow him to take*

The Hospital Director
 Ishaka Adventist Hospital

Dear Sir,

SUBJECT: DATA COLLECTION

Academic research project is an Academic requirement of every student pursuing a Bachelor Degree in Clinical Medicine & Community Health (DCM) of Kampala International University, Western Campus (KIU-WC). DCM program is housed in the School of Allied Health Sciences (SAHS). The students have so far obtained skills in Proposal writing especially chapter one, Three & Questionnaire design. The student's topic has been approved by SAHS Research Unit and is therefore permitted to go for data collection a long side full proposal & dissertation writing. As you may discover the student is in the process of full proposal development. However, the student **MUST** present to you his questionnaire and his research specific objectives that he wishes to address. We as academic staff of Allied Health Sciences are extremely grateful for your support in training the young generation of Health Professionals. I therefore humbly request you to receive and allow the student **RUTEHENDA JOHN BOSCO** Reg. No. **DCM /0012/151/DU** in your health facility to carry out his research. His topic is hereby attached. Again we are very grateful for your matchless support and cooperation.

Topic: **PREVALENCE OF PNEUMONIA AND ASSOCIATED FACTORS IN CHILDREN UNDER FIVE YEARS OF AGE ATTENDING PAEDIATRIC WARD AT ISHAKA ADVENTIST HOSPITAL, BUSHENYI DISTRICT.**

Sincerely yours,

Collins Atuheire
 Collins Atuheire, Head, Research Unit- SAHS

- CC: Dean SAHS
- CC: Associate Dean SAHS



*IAT
 Receive & surprise
 John Bosco during his
 proposed study*

Page 1 of 16
 DISTRICT HEALTH OFFICER
 BUSHENYI LOCAL GOVERNMENT
Dr. Thompson

ISHAKA Adventist Hospital
 P O Box 111, Bushenyi
 RECEIVED
 ACCEPTED AND collect data at
 IAT MATRON
 3/10/2017
 31/01/2017
 Rosel