

## **Prevalence of Pneumonia and associated factors in Children under five years of age attending Pediatric Ward at Ishaka Adventist Hospital Bushenyi District.**

**Rutehenda Johnbosco**

**Faculty of Clinical Medicine and Dentistry Kampala International University, Uganda.**

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### **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 under five years. 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 were 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.

**Keywords:** Children, Pediatric ward, Pneumonia, Health workers and Immunization.

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### **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 [1-6]. In children, pneumonia is the most important single cause of disease burden and a major cause of child mortality globally [7-9]. It is estimated that approximately 2 million children die each year due to pneumonia in developing countries. 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; [10]. Pneumonia is a leading cause of mortality among children under the age of five years globally [11]. The incidence

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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 [12]. 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 ranges from 60 to 100 per 1000 live births, one fifth of these deaths are due to pneumonia [13-16]. An estimated 1.9 million children die from pneumonia yearly [11]. 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% [11-20]. 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 five per year [21-28]. 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 [29-33]. These results from the fact that they make it hard for the lungs to fight infection, so it is easier to get pneumonia [31-36]. The risk factors include poverty, lack of measles immunization [17-20], indoor air pollution, overcrowding, malnutrition/poor nutritional practices, lack of excessive breast feeding and low birth weight; [21]. Other conditions that predispose people to pneumonia include having long-term or chronic diseases like Asthma; Heart disease; Cancer or Diabetes. Typical symptoms of only about one in five care-givers know the signs of pneumonia; only about half of children sick with pneumonia receive appropriate medical care [22]. According to the limited data available, less than 20% of children with pneumonia received antibiotics, the recommended treatment which costs less than \$1 [23]. The statement by UPA states while effective interventions to reduce pneumonia deaths are available, they reach few children [24-28]. Despite the death toll, the disease remains of low priority on the global health agenda and rarely receives attention [29]. 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.

### METHODOLOGY

#### Area of Study

The study was carried out in Ishaka Adventist Hospital located in the town of Ishaka, Bushenyi District, Western Uganda.

#### 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.

#### Study Design

A descriptive questionnaire based cross sectional study was 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.

#### Sample Size Determination

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.

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#### Inclusion Criteria

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

#### 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.

#### 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.

#### 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.

#### Data Quality Control

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.

#### 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.

## RESULTS

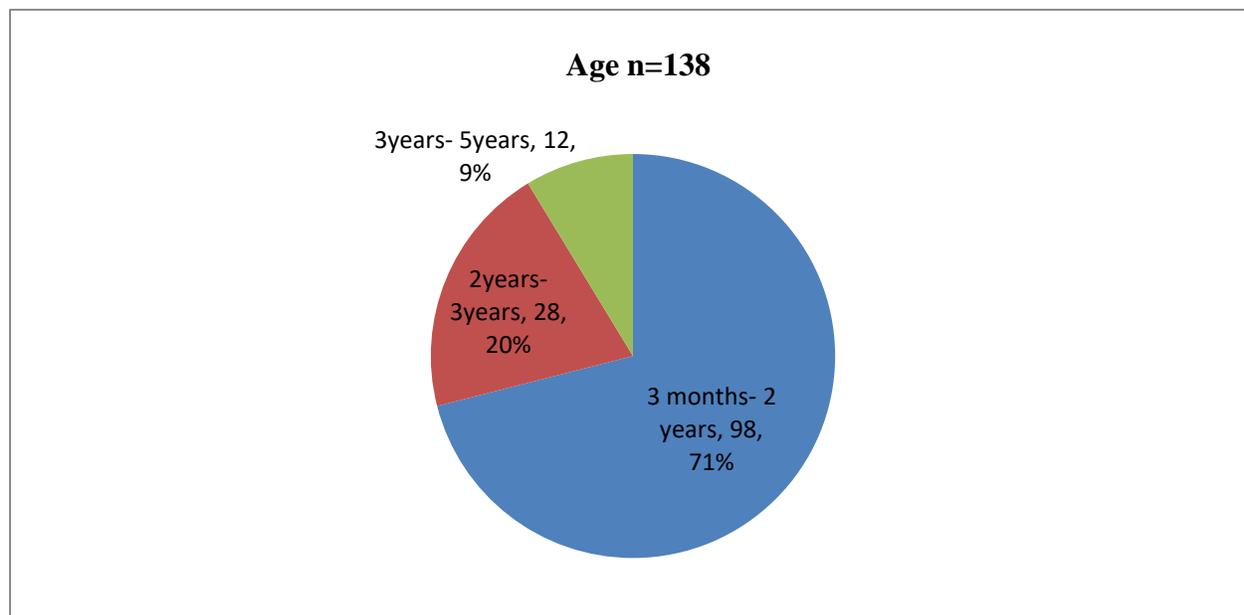


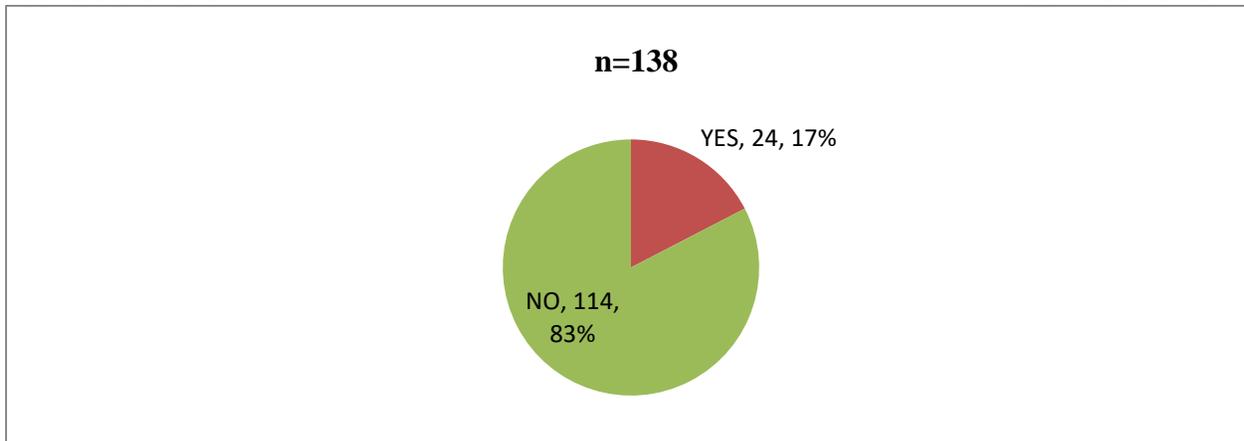
Figure 1: Age of children in the study.

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

#### Prevalence of Pneumonia in Under Five Years Children.

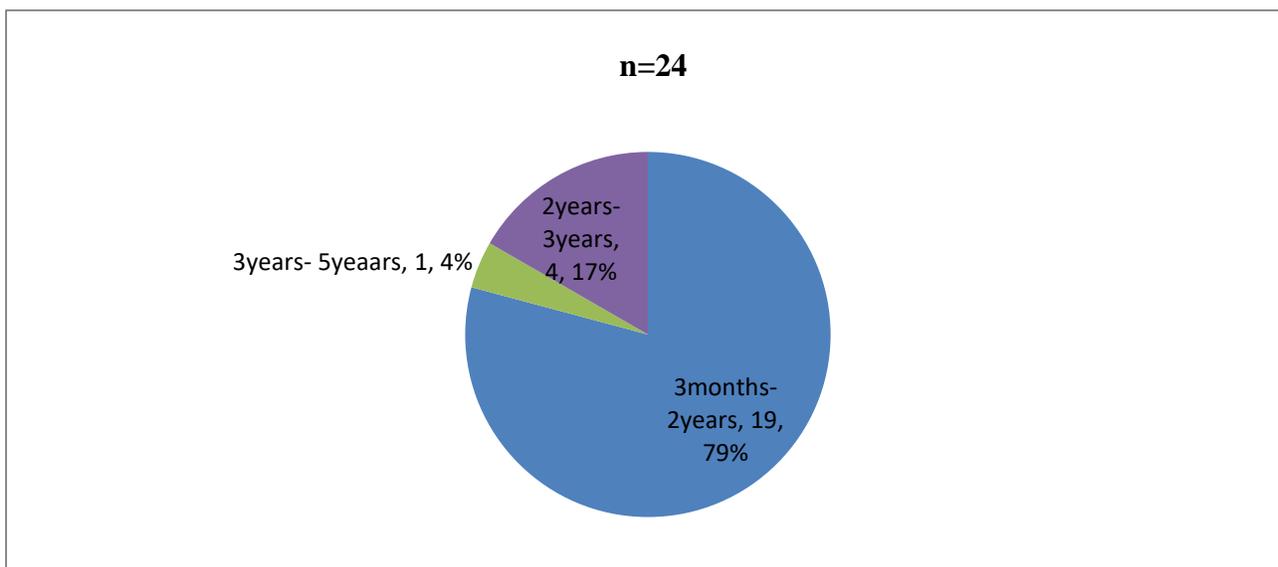
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**Figure 2. Proportion of children with pneumonia.**

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

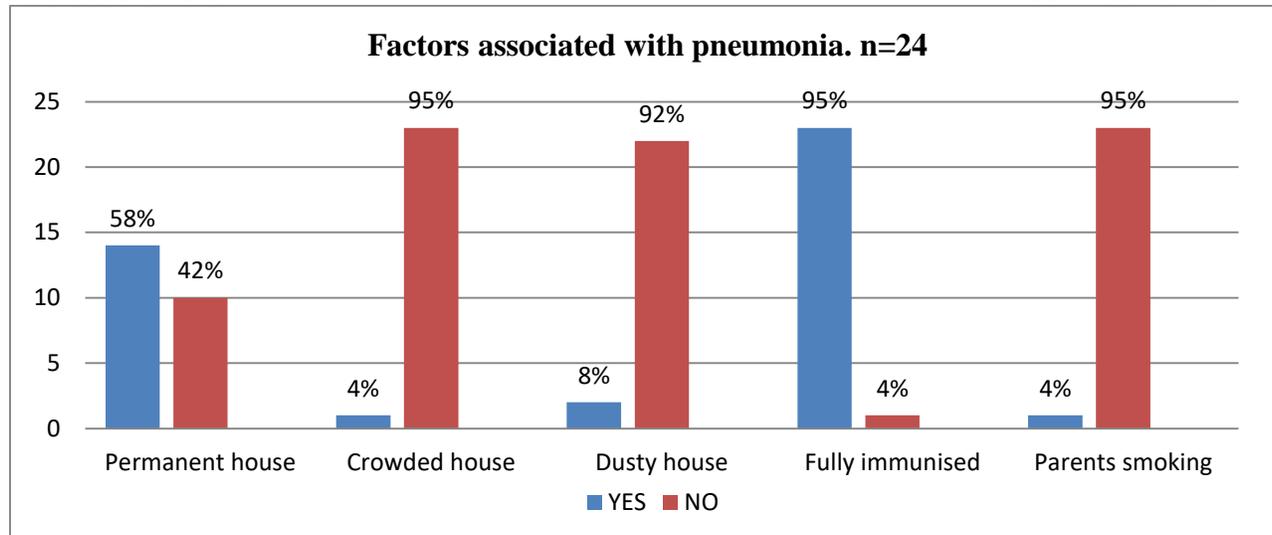


**Figure 3. Age of children with pneumonia**

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%).

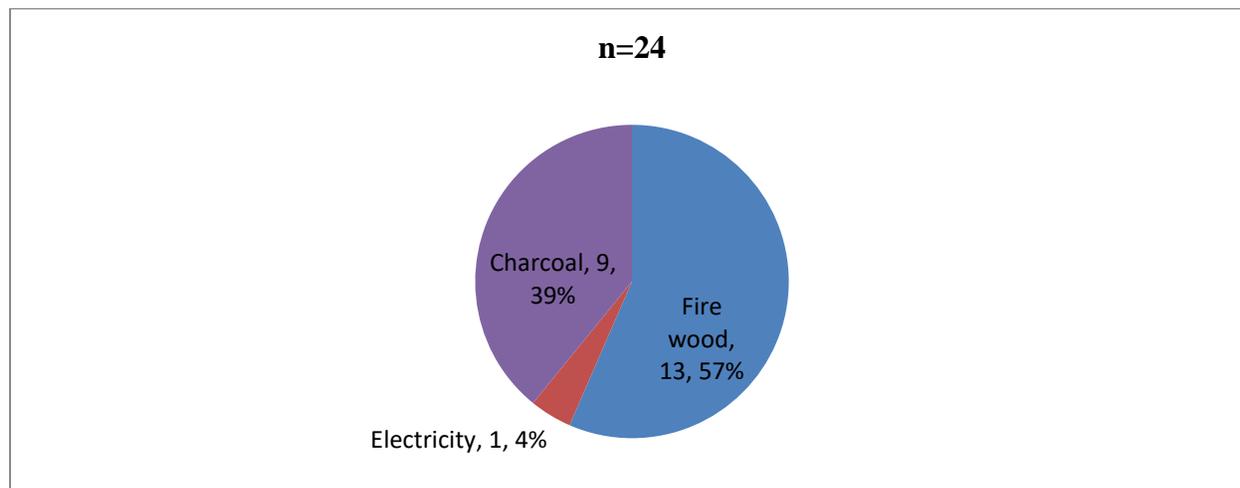
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**Figure 4. Factors associated with pneumonia in children under five**

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 5. 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%).

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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.

#### DISCUSSION

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. 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.

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.

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.

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

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first breathing. This is because is a disease of respiratory system in which the bronchi and the lungs are fluid leading to difficulty in breathing, in relation to other studies according to Smith 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 [30]. 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.

#### CONCLUSION

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%).

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