PREVALENCE OF TUBERCULOSIS IN CHILDREN UNDER FIVE YEARS ATTENDING VIRIKAHOSPITAL, KABAROLE DISTRICT

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A RESEARCH REPORTSUBMITTED TO THE FACULTY OF CLINICAL MEDICINE AND DENTISTRY IN PARTIALFULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE BACHELORS DEGREE IN MEDICINE AND SURGERY OF KAMPALA INTERNATIONAL UNIVERSITY

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NOVEMBER 201

DECLARATION

To the best of my knowledge, I hereby declare that this research report has not been submitted in full or in part to any other institution for any purpose. And that the views herein are my own, unless stated, and where such has been the case, acknowledgement or reference has been made.

Signed..... **Date**..12/12/14...

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APPROVAL

This research report has been submitted for examination with my approval as the candidate's Supervisor.

Signed..... **Date**.....12/12/14

PROFESSOR DIAZ AMNIA

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DEDICATION

This work is dedicated to myFamily

ACKNOWLEDGEMENT

First, to the almighty God, for his favor, ever enduring love, knowledge and wisdom he has granted to me. Special thanks to my supervisor PROFESSOR DIAZ AMNIA, for her guidance. Thanks to Medical superintendant and the management Virika Hospital.

LIST OF ACRONYMS

AIDS	Acquired Immunodeficiency Syndrome
ANC	Ante Natal Care
ART	Antiretroviral Therapy
ARVs	Antiretroviral drugs
BCG	BacilleCalmette-Guérin
BMI	Body Mass Index
CATTS	Community ARV and Tuberculosis Treatment Supporter
CDC	Centers for Disease Control
CEB	Children ever born
CRR	Center for Reproductive Rights
DHO	District Health Officer
DOTs	Directly observed therapy
HAART	Highly Active Antiretroviral Therapy
HIV	Human Immunodeficiency Virus
IMR	Infant Mortality Rate
KIUTH	Kampala International University Teaching Hospital
MDG:	Millennium development goal
M-DOT	Modified-directly observed therapy
MOH	Ministry Of Health
NHP	National Health Policy
NTLP	National Tuberculosis leprosy programme
PLHIV	People Living with HIV
RH	Reproductive health
SPSS	Statistical package for social sciences
STS	Tuberculin skin test
TB	Tuberculosis
TFR	Total fertility rate
USAID	United States Agency for International Development
WHO	World Health Organization.

OPERATIONAL DEFINITION OF TERMS

Health: Health is as defined by MOH a state of complete physical, social and mental well being of an individual or a community and not merely the absence of disease or infirmity.

Morbidity: Morbidity is another term for illness. A person can have several co-morbidities simultaneously. So, morbidities can range from Alzheimer's disease to cancer to traumatic brain injury. Morbidities are NOT deaths. Prevalence is a measure often used to determine the level of morbidity in a population.

Mortality: Mortality is another term for death. A mortality rate is the number of deaths due to a disease divided by the total population. If there are 25 lung cancer deaths in one year in a population of 30,000, then the mortality rate for that population is 83 per 100,000.

Prevalence:Prevalence is a measure of disease that allows us to determine a person's likelihood of having a disease. Therefore, the number of prevalent cases is the total number of cases of disease existing in a population. A prevalence rate is the total number of cases of a disease existing in a population divided by the total population.

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ABSTRACT

World Health Organization (WHO) estimates in 2012 revealed that up to 74 000 children die from TB each year and children account for around half a million new cases annually (WHO, 2012). This study was aimed to determine the prevalence of Tuberculosis in children under five years attending Virika hospital, Kabarole district. The study used a descriptive retrospective qualitative survey.

Result showed thatOut of the 114 child records reviewed, 19(16.7%) had TB. Of these, 14 (73.7%) were male, 5(26.3%) were female. 8(42.1%) were less than 1Year of age, 4(21%) 1 year,4(21%) between 3-4year. 9(47.4%) were clinically examined, while 10(52.6%) were examined with X-ray, 14(73.7%), had contact with TB case, 11(57.9%) were not immunized, 18(94.7%) had nutritional disorders,12(63.2%) had co infections.

From these study findings, the prevalence of Tuberculosis in children under five years attending Virika hospital, Kabarole district was high. And thus to ensure that all children exposed to TB are managed and receive with uttermost urgency, health care providers should integrate childhood TB into their services; TB case suspicion/linking and follow up visits for suspects or confirmed cases, provide DOTs at community level, comprehensive diagnosis and management of Co-infections, encourage TB and HIV control programmes.

CHAPTER ONE

1.0 Introduction

This chapter gives an overview of the study and includes the background to the study, statement of the problem, research questions, broad objective, specific objectives, justification of the study, scope of the study and operational definitions.

1.1 Background

Tuberculosis, MTB, or TB (short for *tubercle bacillus*), in the past also called phthisis, phthisis pulmonalis, TB is caused by a bacterium called *Mycobacterium tuberculosis*. TB bacteria are spread from person to person through the air. The TB bacteria are put into the air when a person with TB disease of the lungs or throat coughs, sneezes, speaks, or sings. People nearby may breathe in these bacteria and become infected. People with TB disease of the lungs or throat can spread bacteria to others with whom they spend time every day. However, children are less likely to spread TB bacteria to others. This is because the forms of TB disease most commonly seen in children are usually less infectious than the forms seen in adults. Not everyone infected with TB bacteria becomes sick. As a result, two TB-related conditions exist: latent TB infection and TB disease (CDC, 2013)

The burden of tuberculosis (TB) has been adversely influenced by the human immunodeficiency virus (HIV) epidemic and by social and economic factors that affect health care delivery. TB in children is a direct consequence of adult TB and is a good marker of current transmission in the community (Reus et al, 2007). Although advances have been made in diagnostics and new drugs for treatment of TB in adults, development in children has lagged behind (UNICEF, 2010). In 2009 an estimated 9.4 million cases of TB occurred worldwide, equivalent to an annual global incidence of 137 per 100,000 populations (WHO, 2010). In the same year, 1.7 million deaths were attributed to tuberculosis (WHO, 2010). TB remains second only to HIV as a leading infectious cause of death globally (Bryce et al, 2005).

Of the one million estimated cases of TB in children worldwide, 75% occur in the 22 high-burden countries (WHO, 2009). In low-burden countries, childhood TB constitutes 5% of the TB caseload,

compared with 20%–40% in high-burden countries (Marais et al, 2006). Regional data from the World Health Organization (WHO) in 2007 showed that smear-positive TB in children aged below 5 years accounted for 0.6%–3.6% of reported cases. In countries with a high prevalence of HIV infection, there has been a marked increase in the incidence and a decrease in the peak age prevalence of infectious TB; thus, most cases now occur in young adults, who are often parents of young children (WHO, 2009). This finding suggests that children in developing countries will emerge as a group at high risk; in fact, in 2007, the majority of children with smear positive TB who were 5 years of age or less were in Africa and Southeast Asia. This is in contrast to the case in low and middle-income countries, where childhood TB is closely associated with poverty, crowding, and malnutrition, with consequently higher death and lower treatment success rates (Nelson, 2004).

TB is among the 10 major causes of mortality among children, with a global estimate of 130,000 deaths per year (WHO, 2010).Since the declaration by the WHO of a 'global TB emergency' in 1993, a wealth of research has addressed important aspects of the burden, management and control of tuberculosis (TB). In general, however, the emphasis has been on adult disease. By contrast, paediatric (under five years) TB has been relatively neglected, mainly due to greater challenges in diagnosis and the lower priority traditionally afforded to children by TB control programmes. As a result both research and surveillance data in the field of childhood TB have been greatly limited. Nevertheless, with roughly a million cases estimated globally each year, and a much higher risk of severe disease and death among young children than adults, paediatric TB remains a public health emergency (WHO, 2009).

Given the overwhelming burden of tuberculosis among the population as a whole and the well-documented vulnerability of young children to active TB including the severe and fatal forms of the disease (Marais et al, 2004), it is perhaps surprising that TB does not feature among the leading causes of death in children. Protection afforded by BacilleCalmetteGu´erin (BCG) vaccination among infants and young children, particularly against disseminated TB and TB meningitis, provides one important explanation for this apparent discrepancy (Trunz et al, 2006). However, even in this group the protective efficacy of BCG is suboptimal, and the best available estimates suggest a high global burden of childhood TB despite wide-scale neonatal BCG vaccination within the Expanded Program of Immunization (Nelson et al, 2004).

1.2 Problem Statement

World Health Organization (WHO) estimates in 2012 revealed that up to 74 000 children die from TB each year and children account for around half a million new cases annually (WHO, 2012). It should be noted that the estimated deaths only include those in human immunodeficiency virus (HIV)-negative children. In fact, the actual burden of TB in children is likely higher, especially given the challenge in diagnosing childhood TB. Compounding this difficulty with diagnosis is the fact that children with TB often come from families that are poor, lack knowledge about the disease and live in communities with limited access to health services. Another compelling reason is that TB is important in the context of children's overall survival (WHO, 2014)

Regional data from the World Health Organization (WHO) in 2007 showed that smear-positive TB in children aged below 5 years accounted for 0.6%–3.6% of reported cases. In countries with a high prevalence of HIV infection, there has been a marked increase in the incidence and a decrease in the peak age prevalence of infectious TB; thus, most cases now occur in young adults, who are often parents of young children (WHO, 2009).

In a study conducted in Kampala in Seven hundred sixty-one child contacts, Prevalence of tuberculosis in our child population was 10%, of which 71% were culture-confirmed positive. There were no cases of disseminated tuberculosis, and 483 of 490 children (99%) started on isoniazid preventative therapy did not develop disease. Multivariable testing suggested risk factors including human immunodeficiency virus (HIV) BCG vaccination was particularly protective, especially among children aged ≤5 years. Adult index characteristics such as sex, HIV status, and extent or severity of disease were not associated with childhood disease (Jaganath, et al., 2013)

Although a number of government policies have been designed aimed at Prioritizing childhood TB at all levels and develop child-specific TB guidance.Empower healthcare workers to think TB through training and access to childhood TB screening tools.Integrate TB screening into existing family, community, and health services.Provide therapy to prevent TB for children at high-risk of developing disease.(MOH, 2013)

Despite all this, no data is available on the prevalence of TB among children under five years attending Virikahospital.

1.3 Justification of the study

Since 2006 there has been a welcome increase in the attention being given to the specific challenges of TB in children and an increased recognition of its importance as a global public health challenge. Although most children with TB may not be responsible for widespread transmission of the disease in the community, TB is an important contributor to maternal and child morbidity and mortality(WHO, 2014)

Once this study is carried out,data obtained to provide data on the prevalence of Tuberculosis in children under five years attending Virikahospital, Kabarole district. This is useful in drawing attention to the number of children under five years affected with TB, attending Virika hospital in Kabarole district. It would also draw attentionto the colossalconsequences that could result from TB-HIV co-infection; thus health providers would require such information when planning interventions, intensifycommunityawareness campaigns and ensure timely screening and contact tracing. All these efforts would be aimed at safe guarding children against consequences of TB, ensure proper testing services and encourage efficient suspicion and screening of children for TB. Such data would be useful to Health Planners in modifying/adopting existing intervention programs, resourcemobilizationand appropriate/equitable allocation.The ultimate goal would thus be to improve the general quality of health and survival potential for children.

1.4 Objectives

1.4.1 Broad Objective

To determine the prevalence of Tuberculosis in children under five years attendingVirikahospital, Kabarole district

1.4.2 Specific objectives

a) To determine the relationship between demographic factors and prevalence of Tuberculosis in children less than five years attending Virika hospital, Kabarole district?
b) To find out the forms of tuberculosis manifestation in children less than five years attending Virika hospital, Kabarole district?

1.5 Hypothesis

The prevalence of Tuberculosis in children under five years attending Virika hospital, Kabaroledistrict is high, hence the **Null hypothesis**; the prevalence of Tuberculosis in children under five years attending Virika hospital, Kabarole is district low.

1.6 Research questions

1. What is the relationship between demographic factors and prevalence of Tuberculosis in children under five years attendingVirika hospital, Kabarole district?
2. What are the forms of tuberculosismanifestationin children under five years attending Virika hospital, Kabarole district?

CHAPTER TWO: LITERATURE REVIEW

2.0: Introduction

This chapter includes all the relevant literature that is directly or indirectly related to this study. This chapter also has the conceptual frame work

Epidemiology and burden of disease

Of the one million estimated cases of TB in children worldwide, 75% occur in the 22 high-burden countries (WHO, 2009). In low-burden countries, childhood TB constitutes 5% of the TB caseload, compared with 20%–40% in high-burden countries (Marais et al, 2006). Regional data from the World Health Organization (WHO) in 2007 showed that smear-positive TB in children aged below 5 years accounted for 0.6%–3.6% of reported cases. In countries with a high prevalence of HIV infection, there has been a marked increase in the incidence and a decrease in the peak age prevalence of infectious TB; thus, most cases now occur in young adults, who are often parents of young children (WHO, 2009). This finding suggests that children in developing countries will emerge as a group at high risk; in fact, in 2007, the majority of children with smear positiveTB who were 5 years of age or less were in Africa and Southeast Asia. In industrialized countries, most childhood TB cases are detected through contact tracing and have good outcomes. This is in contrast to the case in low and middle-income countries, where childhood TB is closely associated with poverty, crowding, and malnutrition, with consequently higher death and lower treatment success rates (Nelson, 2004).

Available Surveillance Data and Burden of Disease Estimates

The main source of global surveillance data for childhood TB comes from notification data collected by National Tuberculosis and Leprosy Programme (NTLP) under the WHO DOTS strategy (WHO, 2010). However, both the quantity and the quality of DOTS notification data relating to childhood TB are limited. A recent study from South Africa demonstrated significant under notification of TB cases (Dunbar et al, 2011) and even in Europe 1 in 5 children with TB are not notified (Teo et al, 2009) so the situation with the available data, WHO estimates of the global TB burden do not currently include a breakdown of the disease burden in children (WHO, 2010). To date the best available published estimates of the global burden of childhood TB have been

derived by combining DOTS notification data for smear positive TB with age-specific estimates of the proportion of the total number of cases that are smear positive (Corbett et al, 2003)

TB in Children

Childhood TB accounts for 6% to 10% of all TB cases worldwide;In countries with a high rate of TB disease, children account for as much as 40% of all new TB cases;At least half a million children worldwide get sick with TB disease each year; andMore than 74,000 children die from the disease each year TB in children accounts for 20% or more of all TB cases in many countries with high TB incidence Young children are most likely to become exposed and infected with TB by close contacts, such as family members. Children can develop TB disease at any age, but the severe forms of TB are most common among children between 1 and 4 years of age. Children can get sick with TB disease very soon after being infected with TB bacteria, or they can get sick at any time later in life. They can even infect their own children, decades later, if not treated.TB in adults and children is curable if identified and treated appropriately. Children at risk of developing TB disease can be identified using simple methods and screening tools. Many children with TB disease can be diagnosed with a clinical evaluation by a trained health care worker (CDC, 2013).

Until recently data from children were aggregated in a single category (<15 years) (Enarson, 2006) ignoring important age-related differences in disease incidence between preschool, school age, and adolescent children. The WHO in 2006 recommended that NTPs report aggregated data for children in at least two categories (0–4 years and 5–14 years). Nevertheless, severe limitations still exist in the quality of available TB notification data for children due to frequent misclassification arising from the very real diagnostic challenges. This study is expected to contribute to the much needed information about age group specific prevalence of TB.

Factors that aggravate spread of TB in children

In study conducted in Gambia, of 206 TB cases were visited, and 384 children aged <5 years were examined. The median age was 2, and 48% were girls. The distribution of TST responses followed a bimodal pattern, with 135 (35%) children presenting a palpable induration. Random effects logistic regression analysis demonstrated that the risk of positive TST response in the child increased with the geographic proximity of the child to the individual with TB within the household and with the degree of activities shared with the individual with TB. It was also associated with the

clinical severity of the disease in the index case. Nutritional status and presence of a bacilli CalmetteGuérin (BCG) scar were not independent risk factors for TST positivity in this population. On multivariate analysis, the effect of geographic proximity to the individual with TB, household size, and duration of cough in the index case persisted for TST responses ≥5 mm(Christian, et al., 2003).

In a cross-sectional study of children in contact with adults who had pulmonary TB in Abuja, Nigeria Of 207 children enrolled in the study, 83 were in contact with adults with smear-negative TB, 78 were in contact with adults with smear-positive TB, and 46 were community controls. Their mean (standard deviation) age was 7.4 (3.8) years (range 1–14 years) and 95 (46%) were male. Previous BCG vaccination was reported for 187 (90%) children, but BCG scars were present in a lower proportion of children in contact with smear-positive adults. This latter group of children also reported slightly more contact time and shared bedrooms more frequently with index-case adults than children in contact with patients with smear-negative TB ($p<0.01$ for both). Two (1%) children in contact with adults with smear-positive TB had cough for >3 weeks and were given therapy for TB(Hiroshi, *et al*, 2006).

Children exposed to adults with smear-positive pulmonary TB have a high risk for infection, and this risk increases with the degree of contact (Grzybowski S, Barnett GD, Styblo K.. 1975). In countries with a high incidence of TB, risk for infection among children in contact with adults with TB is 30%–50%, which is much higher than that reported by industrialized countries (Almeida LM, Barbieri MA, Da Paixao AC, Cuevas LE 2001). However, these risk estimates were established with the tuberculin skin test (TST), which has several limitations. Children vaccinated with *Mycobacterium bovis* BCG or infected with mycobacteria other than *M. tuberculosis* can have false-positive TST reactions, and those with malnutrition, measles, and HIV or other infections often have false-negative reactions (Huebner RE, Schein MF, Bass JB Jerk 1993). In areas with a high incidence of TB, low sensitivity and specificity of the TST may result in either overestimation or underestimation of the risk for transmission.

In study in Gambia, Households of 206 TB cases were visited, and 384 children aged <5 years were examined. The median age was 2, and 48% were girls. The distribution of TST responses followed a bimodal pattern, with 135 (35%) children presenting a palpable induration. Random effects

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Diagnosis challenges

A major challenge of childhood TB is establishing an accurate diagnosis. Less than 15% of cases are sputum acid-fast bacilli smear positive, and mycobacterial culture yields are 30%–40% (Owel, 2002). In the absence of bacteriological confirmation, the diagnosis of childhood TB in countries where TB is not endemic is based on a triad of close contact with an infectious index patient, a positive tuberculin skin test (TST) result, and presence of suggestive abnormalities on a chest radiograph. These criteria, however, have limited application in countries where TB is endemic, because case detection and contact tracing activities are not routine in national TB programs, transmission is not restricted to the household, and most individuals acquire infection and become TST positive during childhood and adolescence (Gates et al, 2007).

Although various approaches using symptom-based diagnosis hold promise for immune competent children, they warrant further validation to improve specificity (Neil et al, 2004). Symptom screening also plays a role in identifying contacts eligible for preventive therapy, although its discriminatory power may be compromised in very young children or among HIV-infected persons. A practical approach is to treat children with suggestive symptoms or signs and chest radiograph abnormalities with a course of broad-spectrum (nonfluoroquinolone) antibiotics and to strongly consider the diagnosis of TB in those with minimal or no improvement. Fine needle aspiration of enlarged superficial lymph nodes and staining the smears for acid-fast bacilli are often helpful even for children who present with predominantly respiratory symptoms. Chest radiograph findings may be normal for a significant proportion of children with confirmed pulmonary TB; moreover, high intra- and inter observer variability and non-availability limit the use of chest radiographs in resource-poor settings (Gregory et al, 2008)

Conceptual framework

It is conceptualized that independent variables that influence the dependent variable. The independent factors work either directly or indirectly through the intermediate factors. These relationships between the independent variables and the dependent variables are illustrated in the conceptual framework below.

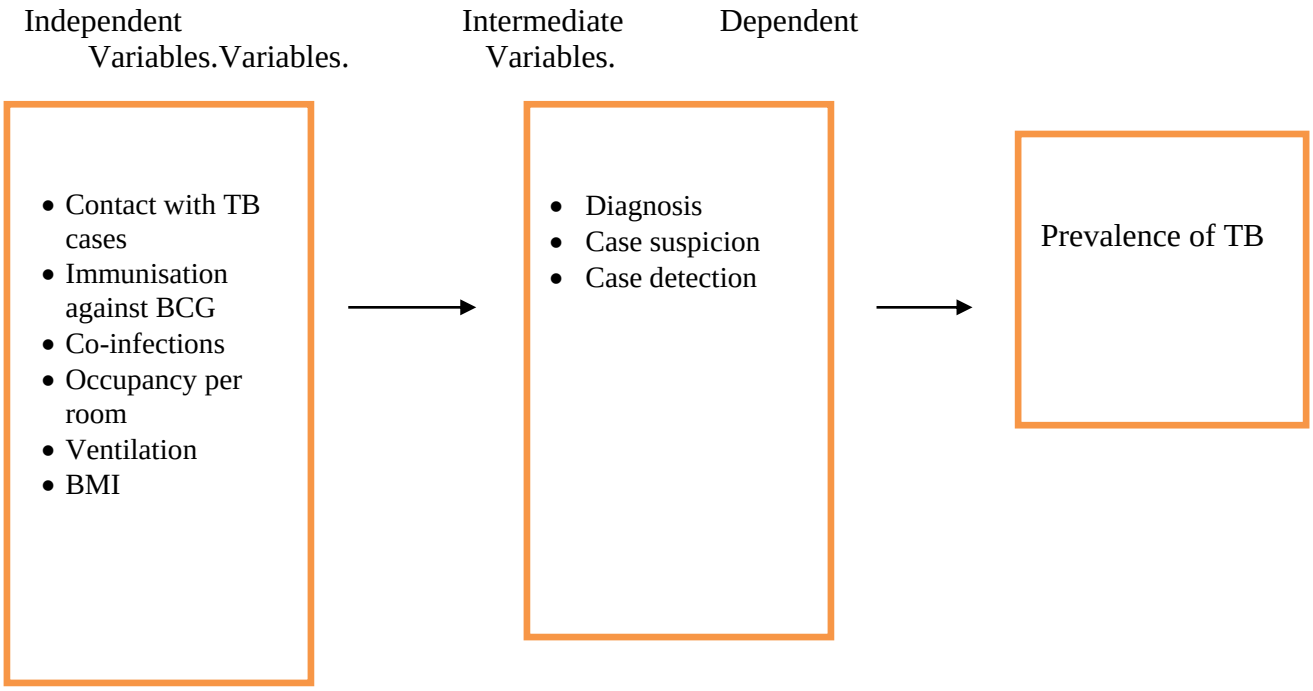


Fig 1: A Conceptual Framework demonstrates the prevalence of Tuberculosis in children under five years attending Virika hospital, Kabarole district.

CHAPTER THREE: METHODS AND MATERIALS

3.0 Introduction

This chapter consists of the study design, study site, study population, sampling size determination, method of data collection, Data processing and analysis, and ethical consideration.

3.1 Study design

The study used a descriptiveretrospective qualitative survey method to assess the prevalence, and the types of Tuberculosis in children less than five years of age attending Virika hospital, Kabarole district. The study involved review of Medical records of children less than five years of age, for the period of 12 months (1st/May/2013 to 30th/ June/ 2014). This study captured Data on age, gender, TB testing / Type of TB, BMI, in those younger than 5years and tuberculosis status.

3.2 Study site

Holy Family Virika Hospital is a Private Not-For-Profit (PNFP) hospital owned by the Catholic Diocese of Fort-Portal, and is located 2 km away from Fort-Portal town, on the Fort-Portal Kasese road, in Kabarole District, Western Uganda. It has a bed Capacity of 207, and provides services to patients not only from Kabarole District, but also from the districts of Kasese, Bundibugyo, Kamwenge, Kyenjojo, and Kibaale. It acts functionally as a referral hospital (http://www.virikahospital.org/)

3.3Study populationand Sample size determination

The study population was all children under five years attending Virika hospital, Kabarole district. The sample size (n) was calculated using the Slovins' formula.

$$n = \frac{N}{1+ N (e)^2}$$

Where n is the sample size, **N** is the Estimated (Average monthly) population size (131; Virika hospital HMIS September/October 2014) and**e** is the level of precision /marginal error which is 5% (0.05), while 1 is constant. (*Source; Guilford J.P. and Frucher B, 1973)*

$$\text{Sample size (n)} = \frac{131}{\mathbf{1+ 131 (0.05)^2}}$$

Sample size (n) = 98.7, the study reviewed 114 children's' files.

3.4Sampling techniques

After sample size was determined, all subjects wereconsidered.

3.5 Data collection

A structured data extraction form /checklist was used to obtain the required information from Medical records of children underfive years of age, for the period of 12 months (1^{st}/May/2013 to 30^{th}/ April/ 2014). This cross-sectional study captured Data on age, gender, TB testing / Type of TB, BMI, inunder 5years and tuberculosis status. Follow up visits to the households, were done where information was not readily available in records was required

3.6 Quality control

Before commencement of the study, the researcher meticulously checked the data extraction forms to enlist any deficits and ensurethatall objectives of the study are adequately covered and after the study, alldata extraction forms were checked on a basis of completeness and consistency by the researcher.

3.7 Data analysis

All Data was transcribed and entered in Microsoft excel. Correlation (Gender, Age, etc), regression and analyses of variance (ANOVA) with the help ofthe statistical package SPSS was used, which was used in determining correlation coefficient between the variables and the analyses, Analysis was done at three levels namely; Univariate, Bivariate and Multivariate Analysis. At theUnivariate level, simple descriptive statistics of the respondents was done in order to determine relationships, and an association between the outcome variablesandindependent variables, cross-tabulations was used. Data was discussed in context of similar researches done elsewhere.

3.8 Inclusion / Exclusion criteria

Inclusion criteria

- Only Medical records of children below the age of five was considered

Exclusion criteria

- Unclear or incomplete Medical records.

3.9 Ethical considerations

Permission to carry out this study was obtained from Kampala International Universitywithapproval from the research supervisor. Permission was obtained from the District Health officer Kabarole and the Medical superintendentVirikahospital.Confidentiality was maintained at all times and all collected data records used was kept for future reference or consultation

CHAPTER FOUR
RESULTS

4.0 Introduction

This chapter discusses the results are presented in form of tables and graphs and discussion of major findings follows.

4.1 Relationship between demographic factors and prevalence of Tuberculosis in children less than five years attending Virika hospital, Kabarole district

Table 2 Shows Relationship between demographic factors and prevalence of Tuberculosis in children less than five years attending Virika hospital, Kabarole district

	Prevalence of TB in Children	
	Frequency	**%**
Prevalence of TB in children (Total)	**19**	16.7%
Gender		
Male	14	73.7%
Female	5	26.3%
Age group (years)		
Less than year	8	42.1%
1-2year	4	21.0%
2-3year	1	5.3%
3-4year	4	21.1%
4-5year	2	10.5%
BMI		
Above average (18.5)	2	10.5%
Below average(18.5)	17	89.5%
Diagnosis		
Clinical	9	47.4%
X-ray	10	52.6%

Contact with TB case		
Yes	14	**73.7%**
No	5	**26.3%**
Child immunized		
Yes	8	42.1%
No	11	**57.9%**
Nutritional disorder		
Yes	18	**94.7%**
No	1	**5.3%**
Co-infections		
Yes	12	63.2%
No	7	36.8
Attending school		
Yes	3	15.8%
No	16	82.2%
Type of house		
Permanent	1	**5.3%**
Semi permanent	2	10.5%
Rammed earth	16	82.2%
Occupancy per room		
2 persons	**1**	**5.3%**
4 persons	**18**	**94.7%**
Functional ventilators		
Yes	**4**	21.1%
No	**15**	**78.9**
Functional windows		
Yes	**5**	26.3%
No	**14**	**73.7%**
Total	**19**	**100%**

A descriptive retrospective study was conducted to assess the prevalence and the types of Tuberculosis in children less than five years of age attending Virika hospital, Kabarole district, were114 records were reviewed. Out of the 114 child records reviewed, 19(16.7%) had tested positive for TB. Information was got by Children recordsreview and by visiting the households, in cases where information was not obtainable from records.

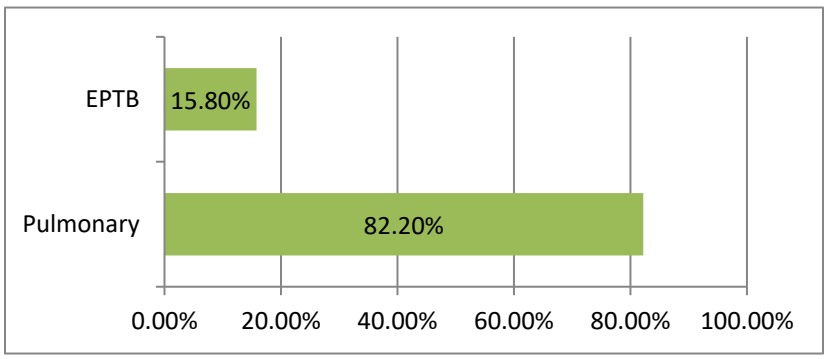
Out of the 114 child records reviewed, 19(16.7%) had TB. Of these, 14 (73.7%) were male, 5(26.3%) were female. 8(42.1%) were less than 1Year of age, 4(21%) 1 year, 4(21%) between 3-4year. 9(47.4%) were clinically examined, while 10(52.6%) were examined with X-ray,17(89.5%) had a BMI below average, only 2(10.5%) had BMI above average.14(73.7%), had contact with TB case, 11(57.9%) were not immunized, 18(94.7%) had nutritional disorders,12(63.2%) had co infections,16(82.2%) were not attending school, 16(82.2%) lived in rammed houses,18(94.7%) had a room occupancy of at least four persons, 14(73.7%) had windows, but these were always closed

4.1 Forms of tuberculosis manifestation in children less than five years attending Virika hospital, Kabarole district

Table 2 Shows Forms of tuberculosis manifestation in children less than five years attending Virika hospital, Kabarole district

Forms of TB		
Pulmonary	16	82.2%
EPTB	3	15.8%
Total	**19**	**100%**

A bar graph 1 Shows Forms of tuberculosis manifestation in children less than five years attending Virika hospital, Kabarole district



The most common form of TB was pulmonary TB 16(82.2%) and only 3(15.8%) had EPTB

CHAPTER FIVE
DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents discussions,interpretations, conclusions and recommendations based on the findings (Results) of the study.

5.1 DISCUSSION

Relationship between demographic factors and prevalence of Tuberculosis in children less than five years attending Virika hospital, Kabarole district

Out of the 114 child records reviewed, 19(16.7%) had tested positive for TB. Out of the 114 child records reviewed, 19(16.7%) had TB, Which is much higher than that as quoted by the WHO, were Childhood TB accounts for 6% to 10% of all TB cases worldwide; 17(89.5%) had a BMI below average, this being an interdependent factor with TB.

The median age was 1, and 14 (73.7%) were male. Findings of this study differ from those as found in a study in Gambia, were the age median age was 2, and 48% were girls, in this study TB in males more than doubled that of females.The findings agree with those by (Grzybowski S, Barnett GD, Styblo K.. 1975), which found out those Children exposed to adults with smear-positive pulmonary TB have a high risk for infection, and this risk increases with the degree of contact.

The distribution of TB positive responses followed a bimodal pattern, with 19(16.7%) children presenting a TB. Random effects logistic regression analysis demonstrated that the risk of positive TB in the child was higher in less than 1 year, those with a low BMI, children who were not immunizedwith BacilleCalmette-Guérin (BCG), those who had nutritional disorders.On multivariate analysis, the effect of geographic proximity to the individual with TB, household size, and duration of cough in the index case persisted, those who leaved in poor housing states, with high occupancy, those that had contact with individual with TB within the household and with the degree of activities shared with the individual with TB.

In the study, the prevalence of TB, was most probably because of contact with TB cases, overcrowding, ill ventilation in the earth rammedhomes, coupled with improper airborne infection control measures, which favor the spread of TB.

Forms of tuberculosis manifestation in children less than five years attending Virika hospital, Kabarole district

Most children had pulmonary TB 16(82.2%) and only 3(15.8%) had EPTB, this finding is in agreement with the roadmap for childhood Tb WHO 2013, which identifies PTB as the most common form of TB among children. this could be attributed to the fact that children are mouth breathers and are thus venerable to many respiratory tract infections, this coupled with exposure to an environment laden with MTB bacteria, will be inhaled in large numbers in to the child's respiratory system.

5.2 CONCLUSIONS

From these study findings, the prevalence of Tuberculosis in children under five years attending Virika hospital, Kabarole district is high. And thus to ensure that all children exposed to TB or suffering from TB are managed and received with uttermost urgency, the individuals, communities, health providers and health plannersought to act onTBnow.

5.3 RECOMMENDATION

- TB programmesshould be included and prioritized, health care providers to integrate childhood TB into their services; revamp TB-HIV coordination structures at the facility, TB case suspicion/linking and follow up visits for suspects or confirmed cases, provide DOTs at community level, comprehensive diagnosis and management of Co-infections, encourage TB and HIV control programmes and involve other stakeholders and local leaders to address the growing problem of childhood TB.
- The WHO to accelerate in-country adoption and use of paediatric TB guidelines and coordinate global efforts to collecting and generating data to improve estimates of the childhood disease burden
- Policy makers to adopt the existing and new WHO recommendations for childhood TB, evaluate implementation, scale-up and assess the impact of implementation strategies.
- Clinicians should routinely assessing children for TB, and linking diagnosed patients to treatment, Improve the quality of TB management to retain and monitor patients more efficiently and to ensure that they complete treatment.

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APPENDICES

APPENDIX 1: DATA EXTRACTION FORM

Location: _____

Investigator: _____ Date of collection: _____

No of Cases._____ Retrospective _____ covering dates _____ to _____

S/NO	Patient No.	Pt. Age (0y-11 month 1, 1y-23 month2, 2y-35 months3, 3y-457moths 4, 4y-59 months 5)	Sex (Male 1, Female 2)	Weight of child (kg)	Height (M)	BMI	Was child Diagnosed with TB? (Yes 1, No 2)	How was TB Diagnosed? (Clinical 1, Sputum 2, X-ray 3, Skin test 4)	Type of TB? (Pulmonary1Extra pulmonary 2)	Didchild have contact with TB case? (Yes 1, No 2)	Was child immunised with BCG? (Yes 1, No 2)	Did child have any nutritional disorder? (Yes 1 No2)	Did child have any other co-infections? (Yes 1 No2)	Attending school? (Yes 1 No2)	What Type of house does child stay? (Permanent 1 Temporary 2 Rammed earth3)	Occupancy per room 2 in room 1, 4 in room 2, 8 in room 3, 10 in room 4, More than 10 in room 5, 1 in a room 6	Does house have functioning Ventilators? (Yes 1 No 2)	Does house have functioning windows? (Yes 1 No 2)	How many windows per room? 1,2,3,4
Total																			

APPENDIX 2: TIME FRAME

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ACTIVITY												
Topic selection												
Topic approval by supervisor												
Proposal development												
Proposal Presentation												
Data collection												
Data analysis												
Report presentation												

APPENDIX 3: BUDGET

	Activity(s)	Description / Justification	Responsible person	Unit cost	No.	Total Cost (Ugshs)
1	**Pre Proposal development**					
	Laptop	Personal laptop will ease literature review, proposal development, data collection and report writing	Principle researcher	**1,300,000/=**	1	**1,300,000/=**
	Purchase of Internet Modem	Internet Modem will be purchased to ease the literature search, data collection and report writing	Principle researcher	**110,000/=**	1	**100,000/=**
2	**Proposal development**					
	Typing and printing	Proposal will be developed to guide the study	Principle researcher	**30,000/=**	2	**60,000/=**
	Internet bundles	Will be required during Literature review	Principle researcher	**100,000/=**		**100,000/=**
3	**Data collection**					
	Transport	Transport to and fro the district	Principle researcher	**60,000/=**	4	**240,000/=**
4	**Data analysis**					
	Statistical analysis			**200,000/=**	1	**200,000/=**
5	**Report writing**					
	Typing and printing	Four copies of the report made	Principle researcher	**110,000/=**	4	**150,000/=**
	Total					**2,150,000**

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EXPLORING THE HEIGHTS

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OFFICE OF THE DEAN,
FACULTY OF CLINICAL MEDICINE & DENTISTRY

18/11/2014

TO WHOM IT MAY CONCERN

RE: MAGEZI JACKSON NYAKOOJO (BMS/0081/102/DU)

The above named is a student of fourth year at Kampala International University pursuing a Bachelor of Medicine, Bachelor of Surgery (MBChB) programme.

He wishes to conduct his research project in your hospital.

Topic: Prevalence of tuberculosis in children under five years attending Virika Hospital, Kabarole District

Any assistance given will be appreciated.

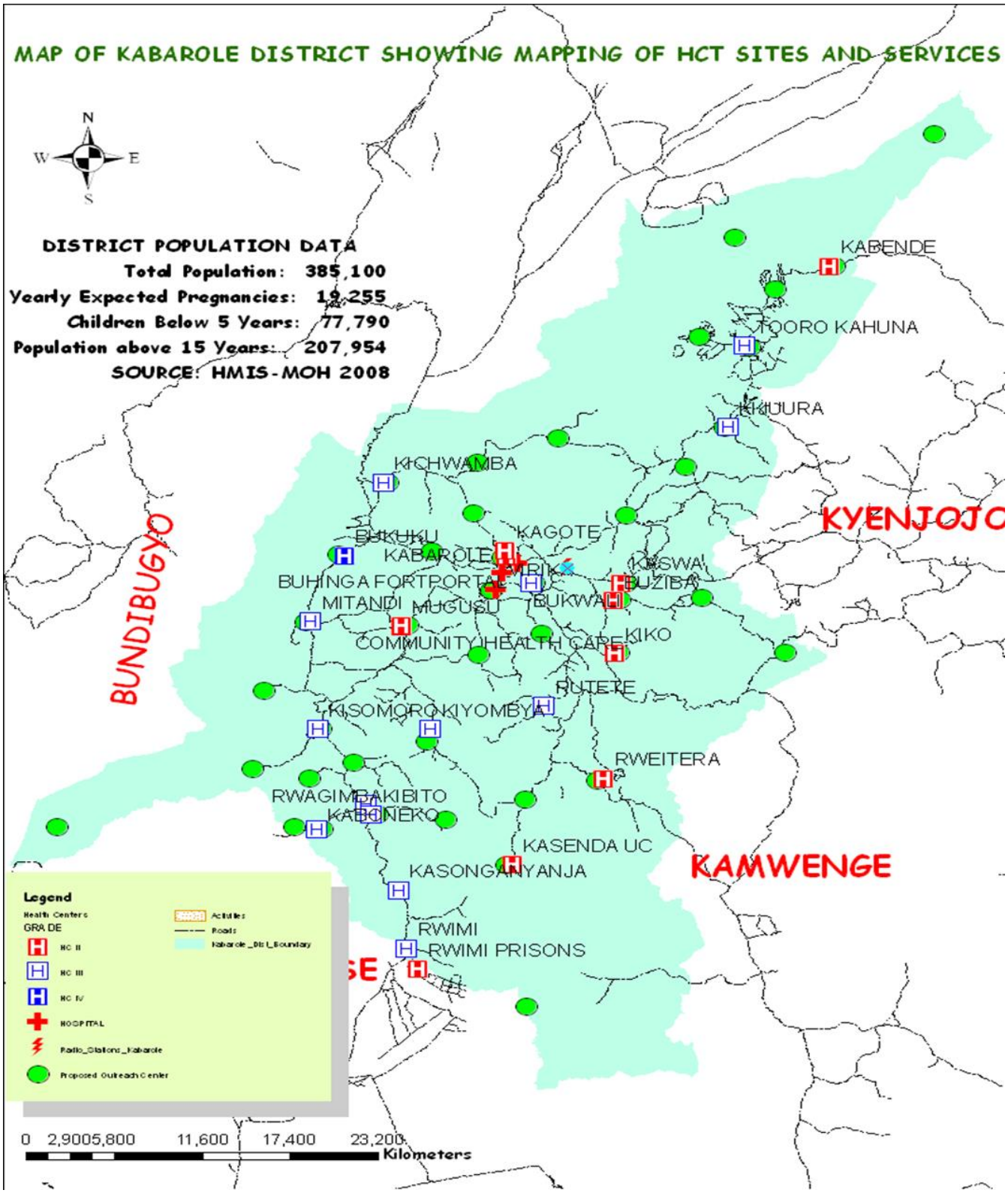
S.O. Aki

Dr. Aki b Surat
Asso. Dean, FCM &D

16 AUG 2014

VIRIKA HOSPITAL
P. O. BOX 233, FORT PORTAL
19 NOV 2014
MEDICAL SUPERINTENDENT

Received
19/11/14
Allowed to proceed
with his research
Mugisa
Dep Med. Director


MAP OF KABAROLE DISTRICT SHOWING MAPPING OF HCT SITES AND SERVICES
N
W
E
S
DISTRICT POPULATION DATA
Total Population: 385,100
Yearly Expected Pregnancies: 19,255
Children Below 5 Years: 77,790
Population above 15 Years: 207,954
SOURCE: HMIS-MOH 2008
KABENDE
TOORO KAHUNA
KIJUURA
KICHWAMBA
BUNDIBUGYO
KYENJOJO
BUKUKU
KABAROLE
KAGOTE
BUHINGA FORTPORTAL
MITANDI
MUGUSU
BUKWA
BUZIBA
KISWA
COMMUNITY HEALTH CARE
KIKO
RUTETE
KISOMORO
KIYOMBYA
RWEITERA
RWAGIMBA
KIBITO
KABONEKO
KASENDA UC
KASONGANYANJA
KAMWENGE
RWIMI
RWIMI PRISONS
Legend
Health Centers
GRADE
HC II
HC III
HC IV
HOSPITAL
Radio_Stations_Kabarole
Proposed Outreach Center
Activities
Roads
Kabarole_Dist_Boundary
0 2,9005,800 11,600 17,400 23,200
Kilometers