

# Tuberculosis Prevalence- A Contemporary Public Health Challenge and the Instituted Barriers in Presbyterian Joint Hospital Uburu, Ohaozara L. G. A. Ebonyi State, Nigeria

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## Abstract

A prevalence study is crucial in assessing the extent of occurrence with regard to an outbreak of a disease. High prevalence of tuberculosis (TB) has been reported in Nigeria. The study aimed at investigating the prevalence of tuberculosis reported cases from 2009-2013 and tuberculosis instituted barriers in Presbyterian Joint Hospital Uburu (PJHU) in Ohaozara Local Government Area, Ebonyi State of Nigeria. Ex-post-facto research design was used for the study. The study population consisted of 675 tuberculosis reported cases from 2009-2013 in PJHU. The same number (675) was the sample size for the study. Data were collected using the researcher's Template which was filled with information from the hospital's records. The template consisted of four items viz: year case was reported, number of cases, gender and TB instituted barriers in PJHU. Analysis of the data showed that the prevalence of tuberculosis reported cases in 2009 was 196 (29.0%), 152 (22.5%), in 2010; 138 (20.4%) in 2011; 110 (16.3%) in 2012 and 79 (11.7%) in 2013. The results showed that the highest prevalence rate 29.0% was recorded in 2009 while the lowest prevalence rate of 11.7% was recorded in 2013. Tuberculosis instituted barriers in PJHU included isolation, safe disposal of sputum, personal hygiene and others as presented in Table 2. The Chi-square analysis of no significant difference in the prevalence of tuberculosis by gender was accepted ( $X^2$  Cal 2.376 <  $X^2$  Tab.3.841, df 1, P= .05). From the findings of the study males were found to be as susceptible to tuberculosis as females. It was recommended among others that teaching of tuberculosis control practices by health workers should be integrated into a wider scheme for health care education and family planning services as well as establishing Directly Observed Home Treatment Short Course (DOHTS) in order to take TB services to the door steps of TB patients.

**Keywords:** Tuberculosis, Prevalence, Control practices, and gender.

## Introduction

The danger tuberculosis has posed to individual and community health is quite alarming. This is based on the report that roughly one out of three in the global population has gotten the infection of Mycobacterium tuberculosis (the micro-organism which causes tuberculosis), and new contaminations occurring at the speed of one per second (Tuberculosis Fact Sheet N'104, 2015). Tuberculosis is the number two highest killer disease due to one infectious causative microorganism worldwide. In 2007, 13.7million people were infected with tuberculosis and in 2010, 8.8 million additional cases were recorded. Deaths recorded also within 2007 were above one million mostly with developing countries, while 0.35 million of these deaths took place among those also having HIV co-infection. In 2012, 1.3million people died from tuberculosis, with 8.6million contracting the disease (Tuberculosis Fact Sheet N'104, 2015). Tuberculosis which most often attacks the lungs, does affect other parts of the body (WHO, 2014). According to Mayo Clinic (2014) two types of tuberculosis disease do exist: active and latent. For active tuberculosis, the agent can bring about symptoms which can lead to others contracting the disease (Mayo Clinic, 2014). Concerning latent type of tuberculosis, the M. tuberculosis stays in the body without causing any harm. The bacteria does not bring about symptoms as well as not being transferrable, however, the microorganisms can turn to becoming active. Meanwhile, the focus of this study is on active tuberculosis.

One out of three in the population of the world has been reported to be infected with the latent type of tuberculosis. There have been a ten percent possibility of latent type of tuberculosis becoming the active type, however, this experience has been found to be more in people who have weak immune system, people living with HIV, malnutrition, or individuals that smoke (WHO, 2014). Tuberculosis many a time attacks the lungs however, it also can attack other body organs. When tuberculosis occurs outside the lungs, symptoms of the disease vary accordingly. Without control and treatment, tuberculosis can also attack other organs of the body through the blood vessels. This could result to tuberculosis disease affecting the bones which may lead to pain in the spine as well as the destruction of the joints; when the brain is infected by tuberculosis, it can lead to meningitis; when the liver and kidney are infected by tuberculosis it affects their function in filtration of waste and this can result to blood mixing with urine. Tuberculosis attacking the heart can adversely affect the ability

of the heart in pumping blood which can lead to death (Mayo Clinic,2014). Every age group can be infected with tuberculosis in the globe. Meanwhile, tuberculosis affects more of young people as well as individuals who live in the third world nations. During the year 2012, eighty percent of documented cases of tuberculosis took place among 22 nations of the world (WHO,2014). Tuberculosis which is caused by Mycobacterium tuberculosis spread through the air from person to person. When people with tuberculosis affecting the lungs cough, sneeze, spit, laugh or talk they spread the disease to others. Tuberculosis is not a hereditary disease but the susceptibility to contact it may be conditioned by heredity.

Studies on tuberculosis in Ebonyi State have been on Directly Observed Treatment Short course (DOT<sub>s</sub>) coverage and trend of tuberculosis notification (Ukwaja et al, 2011). Therefore, there is dearth of literature in the area of tuberculosis prevalence which this study was undertaken to fill the gap.

### **Statement of the Problem**

Tuberculosis has continued to be an important public health challenge which has attracted both local and international attention. The area of concern among tuberculosis patients is the extreme loss of weight and the subsequent death that resulted. Tuberculosis has also been observed through literature as the number two highest destroyer of man as a result of one contagious microorganism in Nigeria and Diaspora (Lucas and Gilles, 2009). Researchers have reported that 1.3million people died from tuberculosis disease, with 8.6million contracting the disease in 2012 (WHO, 2013). WHO (2014) reported that one out of every three in the population of the world has contracted tuberculosis and each second one person was infected with tuberculosis somewhere in the world. The situation has also been compounded by the presence of Human Immunodeficiency Virus (HIV) and Acquired Immunodeficiency Syndrome (AIDS).

Some environmental conditions that encourage the spread of tuberculosis rampant in the society today include: poor sanitation, crowded living conditions, wide spread air, soil and water pollution and increased population, combined with rising poverty. It is an already known fact that tuberculosis has numerous negative outcomes which include huge human and economic loss associated with poor quality of life, low hospital consultations and treatments, as well as low productivity and loss of incomes. Observation has shown that ignorance of sources of tuberculosis infection, late diagnosis and treatment, HIV and tuberculosis co-infection, ineffective control programmes, lack of public awareness of treatment options, health and economic consequences of tuberculosis disease have persistently become problems that aid the spread of tuberculosis in the world over. Presbyterian Joint Hospital Uburu is the only hospital that render's services to tuberculosis patients in Ohaozara L.G.A. therefore the researchers deemed it necessary to investigate tuberculosis prevalence and the barriers instituted in Presbyterian Joint Hospital Uburu of Ebonyi State. It is against the background of health promotion that the researchers were motivated to carry out this study.

### **Purpose of the Study**

The purpose of the study was to investigate tuberculosis prevalence and its barriers instituted in Presbyterian Joint Hospital Uburu in Ohaozara Local Government Area of Ebonyi State,Nigeria. Specifically the study investigated:

1. The total number of tuberculosis reported cases in Presbyterian Joint hospital Uburu within five years- 2009-2013.
2. The tuberculosis instituted barriers in Presbyterian Joint Hospital Uburu.
3. Prevalence of tuberculosis according to gender in Presbyterian Joint Hospital Uburu.

### **Research Questions**

The following research questions guided the study:

1. What is the total number of tuberculosis reported cases in Presbyterian Joint Hospital Uburu from 2009-2013?
2. What tuberculosis instituted barriers existed in Presbyterian Joint Hospital Uburu?
3. What is the prevalence rate of tuberculosis reported cases in Presbyterian Joint Hospital Uburu according to gender?

### **Hypothesis**

This study was guided by the hypothesis that there is no significant difference in the prevalence of tuberculosis reported cases in Presbyterian Joint Hospital Uburu between 2009 and 2013 according to gender.

### **Method**

The design adopted for this study was ex-post facto research design. The design is considered appropriate because Kowalezyk, 2015 stated that ex-post facto design is mostly used in epidemiological studies to retrieve data from records concerning the occurrence of diseases that had occurred in the past. The researchers deemed it

appropriate for the present study.

### Area of the Study

The study was carried out in Presbyterian Joint Hospital Uburu in Ohaozara Local Government Area of Ebonyi State Nigeria. Ohaozara L.G.A. has its headquarters at Obiozara town in Uburu. Ohaozara also has other towns like Ugwulangwu, Uburu and Okposi. It has an area of 312km<sup>2</sup> and a population of 148,626 as of 2008 census (Post Office-with map of L.G.A., 2012). Presbyterian Joint Hospital Uburu is the only hospital that render's services to tuberculosis patients in Ohaozara L.G.A. Ebonyi State is located at the south eastern part of Nigeria, shearing boundaries in the North with Benue state, in the South with Abia state, in the West with Enugu State and in the East, with Cross River State.

### Population for the Study

Population for the study was 674 tuberculosis reported cases in Presbyterian Joint Hospital from 2009-2013.

### Sample and Sampling Technique

The entire population of 674 tuberculosis reported cases were used for the study. Therefore there was no sampling.

### Instrument for Data Collection

The instrument for data collection was the researchers' template which was validated by three experts in the field of health. Their corrections and suggestions were used to produce the final copy of the template. The researcher's template consisted of four (4) items, comprising the year case was reported, number of reported cases, gender and TB barriers instituted in Presbyterian Joint Hospital Uburu. The reliability of the instrument was not established since the instrument took the form of inventory. Moreover, since the variables of the study were fixed and information about tuberculosis disease requires no change or re-modification, no test of reliability was required. The face validity provided enough proof of the instrument's validity and provided the basis for generalization.

### Method of Data Collection

The data was collected by one of the researchers -a medical doctor in the hospital, using the researchers' template. The template was filled with the data from tuberculosis patients' records from 2009-2013 and the hospital's TB instituted barriers' documents.

### Method of Data Analysis

The data collected were analyzed on item-by- item basis to indicate the frequencies, prevalence rates and percentages of the study population. Prevalence rates and percentages were presented in appropriate tables to answer the research questions. The chi-square ( $X^2$ ) statistic was used to test the null hypothesis at .05 level of significance.

### Research Question 1

What is the total number of tuberculosis reported cases in Presbyterian Joint Hospital Uburu from 2009-2013? Data answering this question are contained in Table 1.

Table 1

**The Total number of TB reported cases in PJHU from 2009-2013 (n=675)**

Year	No. of TB reported cases	Percentage (%)
2009	196	29.0
2010	152	22.5
2011	138	20.4
2012	110	16.3
2013	79	11.7
<b>Total</b>	<b>675</b>	<b>100</b>

Data in Table 1 showed that the total number of tuberculosis reported cases in Presbyterian Joint Hospital from 2009-2013 was 675 cases. The Table further showed that the tuberculosis reported cases ranged from 11.7% to 29.0%; the highest number of tuberculosis reported cases 196(29.0%) was in the year 2009, while the lowest number 79(11.7%) was in the year 2013. These imply that tuberculosis prevalence was high in some years and low in some other years.

### Research Question 2

What tuberculosis instituted barriers existed in Presbyterian Joint Hospital Uburu?

**Table 2**  
**Tb Instituted Barriers Existing in PJHU Ohaozara L.G.A. Ebonyi State**

S/N	Tb Instituted Barriers PJHU
1.	Isolation
2.	Safe disposal of sputum
3.	Airy environment
4.	Good ventilation
5.	Personal hygiene
6.	Use of nose and mouth masks

**Source: PJHU TB Control documents, 2013**

Table 2 showed six tuberculosis instituted barriers existing in Presbyterian Joint Hospital Uburu. The barriers ranged from isolation to the use of nose and mouth masks. Safe disposal of sputum, airy environment, good ventilation and personal hygiene were also indicated in the table.

### Research Question 3

What is the prevalence rate of tuberculosis reported cases in Presbyterian Joint Hospital Uburu according to gender? (n=675)

Table 3

**Prevalence rate of tuberculosis reported cases in PJH Uburu according to gender? (n=675)**

Year	Male n=396	(%)	Female n=279	(%)
2009	109	27.5	87	31.2
2010	85	21.5	67	24.0
2011	90	22.7	48	17.2
2012	60	15.2	50	17.9
2013	52	13.1	27	9.7

Data in Table 3 showed that the prevalence rate of tuberculosis reported cases in Presbyterian Joint Hospital Uburu according to gender ranged from 13.1% to 27.5% for males, and 9.7% to 31.2% for females. The highest prevalence rate 27.5% occurred in 2009 for males while the lowest prevalence rate for males 13.1% occurred in 2013. The highest prevalence rate for females 31.2% was recorded in 2009 while the lowest prevalence rate for females 9.7% occurred in 2013.

### Hypothesis

There is no statistically significant difference ( $p < .05$ ) in the prevalence of tuberculosis reported cases in Presbyterian Joint Hospital Uburu between 2009 and 2013 according to gender. Data testing this hypothesis are contained in Table 4.

**Table 4**

**Summary of Chi-square ( $X^2$ ) Analysis of no Significance Difference in Tuberculosis Prevalence between 2009 and 2013 according to gender (n=675)**

Variable	2009	2013	Cal- $X^2$	Tab- $X^2$	df	P	Decision
Male	109(14.7)	52(46.3)	2.376	3.841	1	.05	Accept
Female	87(81.3)	27(32.7)					

The result in Table 4 showed that the calculated chi-square (Cal- $X^2$ ) value of 2.376 is less than table chi (Tab- $X^2$ ) value 3.841 at .05 level of significance and df 1. The null hypothesis of no significant difference in the tuberculosis prevalence between 2009 and 2013 according to gender was therefore accepted.

### Discussion

The findings in Table 1 showed that the total number of tuberculosis reported cases in Presbyterian Joint Hospital Uburu from 2009-2013 was 675. The result also revealed that the highest number of tuberculosis reported cases of 196(29.0%) was reported in 2009 while the lowest 79(11.7%) was recorded in 2013. The high prevalence rate of 29.0% is in line with the assertion of Espinal (2000) that tuberculosis prevalence occurred most in developing countries, which Nigeria is one of them, Ohaozara LGA in Ebonyi State of Nigeria being also affected. Tuberculosis Fact Sheet N'104 (2014) also reported that 13.7 million people contracted tuberculosis and there were 8.8 million new cases within this period of study the world over. However, the remarkable low prevalence rate of 11.7% recorded in 2013 should owe a lot to the tuberculosis barriers instituted in Presbyterian Joint Hospital Uburu, Ohaozara L.G.A of Ebonyi State Nigeria.

Results in Table 2 showed that tuberculosis instituted barriers in Presbyterian Joint Hospital Uburu ranged from isolation to wearing of masks. Barriers such as good ventilation, safe disposal of sputum and airy environment were also recorded. However, the World Health Organization (WHO) had earlier on proposed practical and low-cost intervention strategies to reduce tuberculosis in settings where resources are limited.

These strategies emphasize prompt diagnosis and rapid treatment of tuberculosis rather than expensive technologies, such as isolation rooms and respirators (WHO,2014). That being as it may, still encourages restricting the tuberculosis patient to his crockery which would go a long way serving the purpose of modified non-expensive isolation. In the case of safe disposal of sputum, WHO (2014) also reiterated that effective tuberculosis infection control strategy depends on early identification, isolating infected persons, rapidly and effectively treating persons with tuberculosis. The World Health Organization among other strategies recommended developing an infection control plan, educating healthcare workers, and patients, improving sputum collection practices, performing triage and evaluation of suspected tuberculosis patients in outpatient settings, and reducing exposure in the laboratory (WHO,2014). Other barriers instituted in the hospital under study included good personal hygiene and use of nose and mouth masks. All these measures owe a lot to the low prevalence rate recorded in the recent years of the study (2011,2012 and 2013).

Results in Table 3 showed that highest prevalence rate of tuberculosis for males 27.5% occurred in 2009 while the lowest 13.1% was in 2013. The highest for females 31.2% was recorded in 2009 while the lowest 9.7% was in 2013. This finding was not surprising but was expected especially since it confirms the work of Elegbe, et al. (2013); Lucas and Gilles (2009) who reported that the prevalence of tuberculosis has been known to vary with several factors including gender. However, the Chi-Square statistic ( $X^2$ ) analysis showed that males were as susceptible to tuberculosis as females. This was contrary to Srdhar (2006) who stated that males were more susceptible to tuberculosis than females probably because they were more mobile than females. Why one would not be surprised with the present finding is that the 21<sup>st</sup> century women are as mobile as their male counterparts.

### Conclusion

Based on the results and findings of the study, it would be concluded that tuberculosis prevalence in Presbyterian Joint Hospital was high. However, based on the instituted tuberculosis control practices, there was a gradual progressive low prevalence rate in recent years(2012 and 2013) of the study. Meanwhile, there was no statistically significant difference in the prevalence of tuberculosis reported cases in Presbyterian Joint Hospital Uburu between 2009 and 2013 according to gender; hence tuberculosis prevalence in Presbyterian Joint Hospital Uburu was not dependent on gender.

### Recommendations

Based on findings of the study, the following recommendations aimed at improving tuberculosis control practices in PJHU are proffered:

1. The teaching of tuberculosis control practices by health workers should be integrated into a wider scheme for health care education and family planning services.
2. The medical personnel attending to tuberculosis patients should put on protective attire as in the case of Ebola disease treatment.
3. Hospital administrators should mount Directly Observed Home Treatment Short course (DOHTS) that would take tuberculosis care to the door steps of the tuberculosis patients.

### References

- Elegbe, I.A., Salamu, L., and Ad neyemo, A. O. (2013). Plumunary Tuberculosis in Nigeria. (On-line: [rshsagepub.com/content/106/2/69](http://rshsagepub.com/content/106/2/69)).
- Espinal, M (2000). Infectiousness of Mycobacterium tuberculosis in HIV-1 infected patients with tuberculosis: a prospective study. *Lancet* 355:pp. 275-280.
- Kowalczyk, D. (2015). Definition of Ex-post facto research Design. [studycom/academy/lesson/ex-post-facto](http://studycom/academy/lesson/ex-post-facto). Assessed 21/9/2015.
- Lucas, A. O., and Gilles, H. M. (2009). A short textbook of preventive medicine for the Tropics (4<sup>th</sup> eds). Dutton: ELBS.
- Mayo Clinic, (2014). Tuberculosis Complications. Medical News Today-Knowledge Centre. [www.medicalnewstoday.com/.8856.phb](http://www.medicalnewstoday.com/.8856.phb).
- Mayo Clinic, (2014). Tuberculosis prevention. Medical News Today-Knowledge Centre. [www.medicalnewstoday.com/.8856.phb](http://www.medicalnewstoday.com/.8856.phb) Assessed 08/01/2015.
- Obi, R.K., Amadi, A.N., Idika, I.M. and Nwanebu, F.C. (2008). Studies on the distribution of clinically diagnosed pulmonary tuberculosis in Ebonyi State, Nigeria. *Nigerian Journal of Parasitology* 29, (2), 2008, 106-109.
- Sridahar, B.R. (2006). Community Health Nursing. India. Aitebs publishers.
- Tuberculosis Fact sheet N°104 (2015). World Health Organization. Retrieved November 4, 2014 from [www.who.int/./en/](http://www.who.int/./en/)
- Ukwaja, K.; Alobu, I., Ifebunandu,N., Osakwe, C., & Igwenyi, C. (2011). DOTs coverage and trend of tuberculosis notification in Ebonyi, Southeastern Nigeria, 1998 – 2009. *The Pan*

African Medical Journal ; 200 (11): 9 – 12.  
WHO, (2014). *Tuberculosis Prevalence in the world*. Global Tuberculosis Report 2014. [www.who.int/en/](http://www.who.int/en/).  
WHO, (2013). Global Tuberculosis Control. *WHO/HTM/TB/2013.11*. Geneva.