

# **Prevalence and Control of Tuberculosis in HIV/AIDS Patients attending Kampala International University Teaching Hospital**

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## **ABSTRACT**

Tuberculosis (TB) is one of the world's most common cause of death in the era of human immunodeficiency virus (HIV). TB and HIV are called a "deadly duo" as HIV weakens the immune system and makes them more susceptible for TB infection. Uganda is ranked 20<sup>th</sup> among 22 countries with a high burden of TB. 54% of TB patients are HIV co-infected and about 30% of the HIV related deaths are attributed to TB. TB mortality remains high in Uganda, with about 4,000 people dying of the disease every year, an equivalent of the population in a parish setting. To find out the prevalence of tuberculosis among HIV infected patients reporting to Kampala International University Teaching Hospital. This was a cross sectional study conducted among HIV infected patients within Ishaka and the surrounding villages. The study randomly recruited 76 patients who filled in the questionnaires administered to determine the prevalence and methods of infection control among HIV /TB infected patients. The prevalence of TB among HIV infected patients was still high at 10.5% despite patients having known the status. Analysis of the socio-demographic factors showed that TB incidence was distributed throughout all ages provided one was HIV positive although onset was highest in early adulthood (26-30 years) and had a death rate of 9.1%. Administrative, personal control measures and DOT centres were the modal of control in management and control of tuberculosis at KIUTH. Personal protections and environmental control of infections were affected by administrative decisions and thus poorly implemented. Despite the reduction in the mortality of tuberculosis among HIV infected persons, there is a lot of room for improvement especially in control of infections. To plan for and implement the administrative control of TB Infection control (TIC) among HIV infected clients and also come up with a follow up network for improved patients who are referred to the village DOT centres because of distance and other reasons. Mass education of the community about the factors associated with the high prevalence of TB.

**Keywords:** Tuberculosis, HIV, Infected patients, Personal protections, Disease.

## **INTRODUCTION**

Tuberculosis (TB) is one of the diseases that has survived for centuries globally and is still very common to date with an estimated 8.9million new cases worldwide in 2014 [1-5]. The increase in the number of people living with human immunodeficiency virus (HIV) has dramatically increased the occurrence of TB and it shares about twenty-five of all cases of the deaths [6]. The association between HIV and tuberculosis present an immediate and grave public health and socioeconomic threat in developing countries [7-15]. The World Health Organisation (WHO) has prioritised tuberculosis as a leading killer disease among people living with HIV [16]. TB is caused by the bacterium *Mycobacterium tuberculosis*, which can be present as either latent TB infection or TB disease. Latent TB infection means that TB bacteria are living in the body but not causing any symptoms, and people with latent TB are not sick, have no symptoms, and cannot spread TB bacteria [17]. Persons infected by the bacteria have about a 10% chance of developing tuberculosis during the remainder of their lives: Thus, they have a less than 0.5% chance of developing overt disease annually [18] while 10% of persons infected by both TB and HIV develop tuberculosis disease annually (Enarson DA et al., 2001). The implication of HIV infection is that it activates dormant tuberculosis to rapid disease progression of tuberculosis and death [19-35]. The World Health Organisation (WHO) has prioritised TB as a leading killer disease and the most common opportunistic infection in patients living with HIV

[16]. In resource limited countries at least one in four people living with living with HIV suffer death due to TB [36]. Collaborative TB/HIV activities are essential to decrease mortality of TB among HIV patients and to ensure that HIV positive TB patients are identified and treated appropriately [16]. Fortunately, there are a number of treatment options for people living with HIV [37-45] who also have either latent TB infection or TB disease [46-65].

## METHODOLOGY

### Area of Study

The study on the prevalence and control of TB among HIV infected persons was conducted in the month of April, 2017 at Kampala International University Teaching Hospital (KIU-TH).

### Study Design

A cross-sectional study was used to conduct the study due to the research having been carried out at a specific time without following up the study participants or looking into their past history.

### Study Population

The study targeted all the HIV patients who reported to the CHAI clinic and had ever been diagnosed with TB disease.

### Sample Size Determination

The sample size for the patients attending to the Health Unit was calculated using Fishers' formula (1962), given by:

$$n = \frac{z^2 Pq}{d^2}$$

Equation 1: Fishers Formula for Sample Size determination

Where n= sample size

z= confidence interval

p= total Population of the target population.

Assume p=50% (maximum variability). Furthermore, suppose we desire a 95% confidence level and ±5% precision.

When: p = 0.5, q = 1-p (0.5), and d = 0.62, z = 1.96(constant at 96% Confidence Interval)

$$n = \frac{1.96^2 * 0.5 * 0.5}{0.11^2}$$

$$n = 76$$

Therefore: n= 76 respondents were considered in this study

### Sampling Techniques

The study employed convenience sampling techniques to select respondents. Both patients admitted at the facility and those who come to the health unit for follow up during ARV and TB drug refills, medical check-up were selected to participate on arrival. These sampling techniques enabled efficient data collection within a short time, thus saving time and money, provide the flexibility needed to collect data within a short time and took advantage of those who happened to be there at the time.

### Inclusions and Exclusions Criteria

#### Inclusions

- ❖ All HIV infected patients reporting to KIU-TH aged 15 to 49years. This because the most infected population falls within this age bracket [46].
- ❖ Patients who were mentally sound and were willing to participate.
- ❖ Patients present at time of data collection.

#### Exclusions

- Patients with mental illnesses or altered level of consciousness.
- Patients admitted in the Intensive Care Unit.
- Critically ill patients.

### Data Collection

Document analysis (case files) were used to determine the duration, type and nature of treatment that the patients had received for HIV or TB.

### Ethical Consideration

The researcher obtained permission from the administration of KIU-TH and the faculty of Allied Health Sciences before data collection was commenced. The questionnaires were answered voluntarily and the names of participants were not required. Confidentiality of patients was also maintained by the researcher

### RESULTS

76 respondents who are all HIV positive were used for this study and 25 of them (32.9%) were between 26-30 years, the youngest were 15-20 years and the oldest were 45-49 years. The majority, 41 respondents (53.9%) were females and 32 of all the respondents (42.1%) were Banyankore and 53 respondents (69.7%) were married.

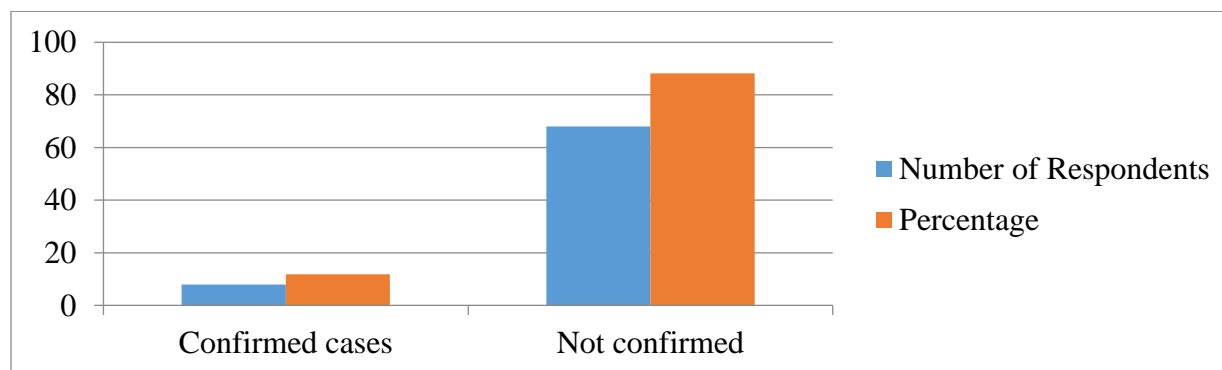
**Table. 1**

Age in years	Frequency	Percentage (%)
15-20	5	6.6
21-25	8	10.5
26-30	25	32.9
31-35	10	13.2
36-40	9	11.8
41-45	7	9.2
46-49	12	15.8
<b>Sex distribution of respondents</b>		
Male	35	46.1
Female	41	53.9
<b>Tribe of Respondents</b>		
Munyankore	32	42.1
Mukiga	24	31.6
Muganda	9	11.8
Other	11	14.5
<b>Marital status</b>		
Married	53	69.7
Unmarried	23	30.3
<b>Totals</b>	<b>76 respondents were used</b>	<b>100%</b>

**Table. 2: Symptoms of TB**

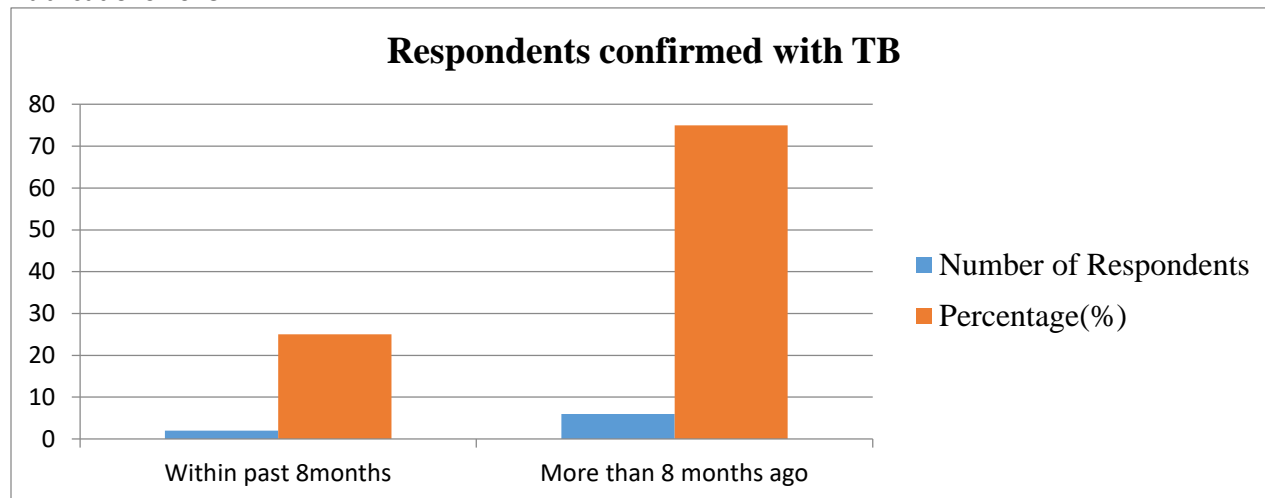
Signs and symptoms	Number of respondents
Cough for > 2 weeks	9
Evening fevers	12
Night sweats	8
Weight loss	15
Tiredness	68
None	2

### Tuberculosis Tests Results



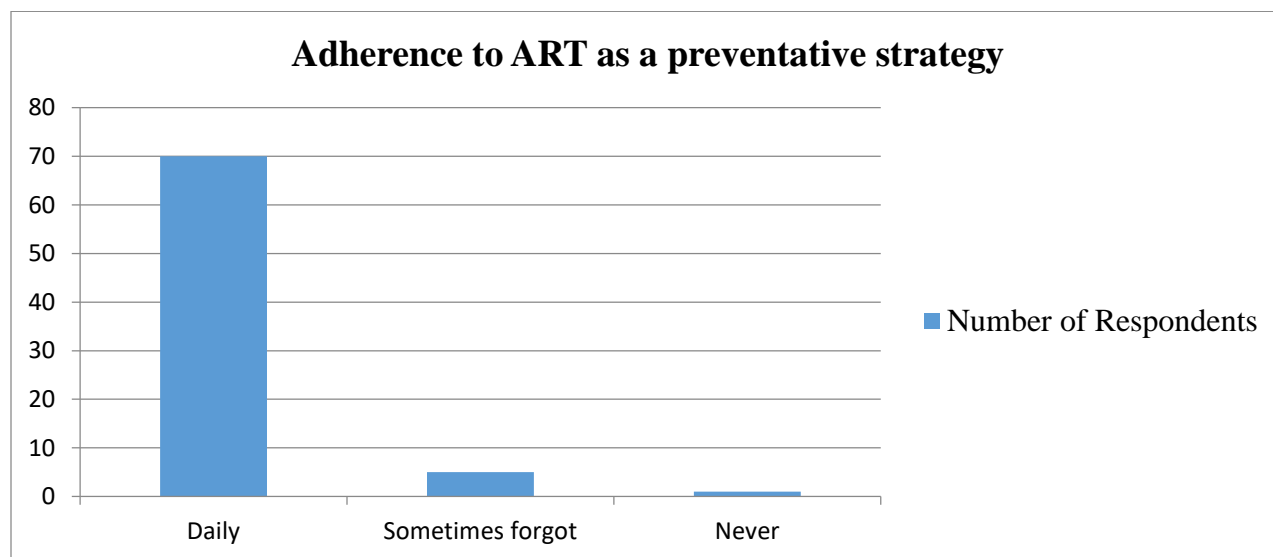
**Figure. 1:** From the figure above, 8 of the respondents (10.5%) were confirmed tuberculosis cases and 68 of the respondents (89.5%) were not confirmed with tuberculosis.

From the figure below, 3 of the respondents (25%) had been confirmed with in the last 8 months while 5 respondents (75%) had been confirmed more than 8 months ago.



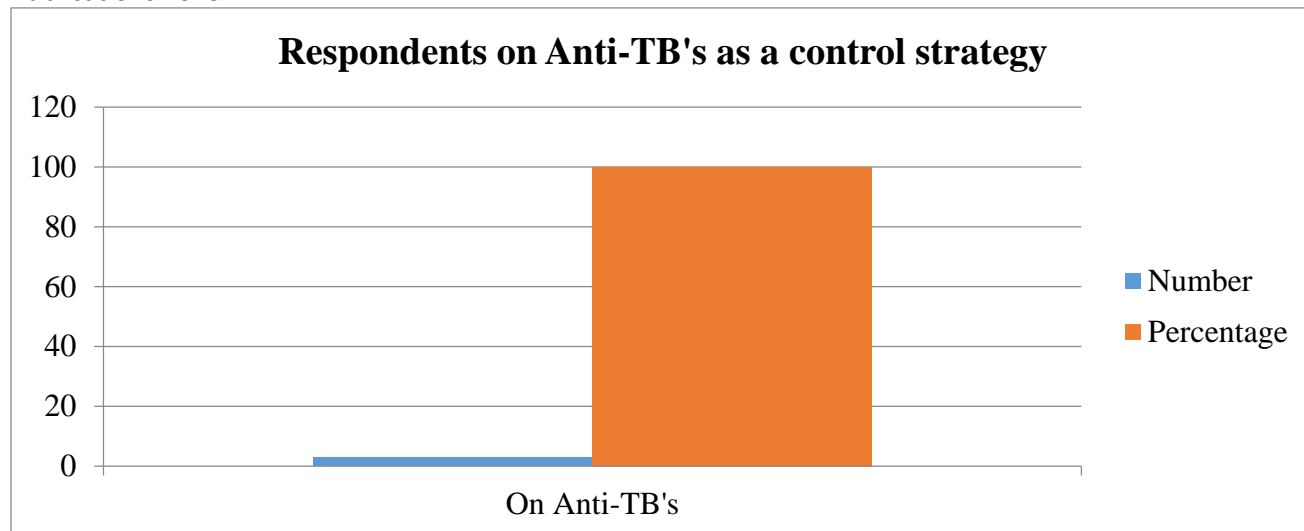
**Figure. 2:** Infection control measures both at personal and personal and health facility level.

Adherence to ART as a preventative strategy. The graph above shows that 70 respondents took their medication on a daily basis while 5 respondents sometimes forgot to take their medication and 1 respondent had never started on ART.



**Figure. 3:** Anti-tuberculosis treatment as a control strategy.

All 3 respondents (100%) who had been diagnosed with tuberculosis within the last eight months were still on anti-tuberculosis medication.



**Figure. 4:** Commonly practiced infection control methods both at personal and health facility level.

As shown on the table below patients reported use of separate houses for TB infected individuals as the most practiced infection control strategy, 38(50.0%) followed by ventilated space 35(46.1%) and the least was use of separate eating utensils 3(3.4%).

**Table 3: Infection Control practices**

Infection Control practice	Responses	
	Number	Percentage
Ventilated Space	35	46.1%
Separate House	38	50.0%
Separate utensils	3	3.9%
<b>Total</b>	<b>76</b>	<b>100.0%</b>

### DISCUSSIONS

HIV/AIDS being a remarkable underlying immune-suppressive disease, it increases risk of infection/activation of latent TB because of immune-suppression with a HIV prevalence in incident TB despite greater than 80% having known their HIV status. This is true owing to the fact that this research was conducted only among confirmed HIV infected people who still reported occurrence tuberculosis disease. The incidence of TB disease among HIV positive persons has reduced although the disease still poses a threat to the health of all HIV positive people. This study showed that all of the patients at KIUTH practised at least one form of infection control strategy. However, the findings also noted that the tuberculosis infection control among HIV patients was lacking especially when it came to Administrative control and comprehensive personal protection. Up to date, very few studies in Uganda have described the effectiveness of implementing a combination of infection control among rural health facilities in Uganda. In this study, majority of the patients (50%) reported the use of separate houses for TB infected individuals as the most practiced infection control strategy and 46.1% used ventilated space in addition to other control measures such as cough etiquette and but only 3.9% used separate utensils and therefore increasing chances of spread especially from sharing drinking cups or glasses. This study noted that available transmission control strategies and technologies, such as early diagnosis, triage and separation, masks on patients, and treatment, need to be implemented.

### CONCLUSIONS

Administrative, personal control measures and DOT centres were the modal in management and control of tuberculosis at KIUTH. Personal protections and environmental control of infections were affected by administrative decisions and thus poorly implemented. Despite the reduction in the mortality of tuberculosis among HIV infected persons, there is a lot of room for improvement especially in control of infections.

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