

**IMPLEMENTATION OF COMMUNITY-BASED TB DOT IN AN URBAN SETTING:
A CASE OF RUBAGA DIVISION, KAMPALA**

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2011-BSCPH-PT-013

**AN UNDERGRADUATE RESEARCH PROJECT REPORT SUBMITTED TO IHPM IN
PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF A
BACHELORS DEGREE OF SCIENCE IN PUBLIC HEALTH OF
INTERNATIONAL HEALTH SCIENCES UNIVERSITY**

DECEMBER, 2014

DECLARATION

To the best of my knowledge, I, SEMPEERA HASSARD, declare that this report is original and a result of my own study, except where otherwise acknowledged; and has never been presented anywhere for any award.

I am therefore presenting it to the institute of International Health Policy and Management in partial fulfillment of the requirement for the award of bachelors of Science in public Health of International Health Sciences University.

Sign: -----Date: -----

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DEDICATION

I dedicate this work to my Mum Edith Nakibuuka for the values she has installed in me. I also dedicate it to my wife Nakanwagi Rashidah and my daughter Raihana for their support throughout my studies.

ACKNOWLEDGEMENTS

I would like to thank my supervisor Mrs. Angella Kawooya for her a guidance and expertise put into this work. I also thank Dr Esther Buregyeya and Dr. Justine Bukenya for their guidance in fine tuning the research topic

Finally I would like to thank Dr. Fredrick Makumbi for his encouragement and guidance throughout my studies and carrier.

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ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
CB-TB DOT	Community Based Tuberculosis Directly Observed Therapy
HCWs	Health Care Workers
HIV	Human Immune Virus
IC	Infection Control
LTBI	Latent Tuberculosis Infection
MDR-TB	Multi-Drug Resistant Tuberculosis
WHO	World Health Organisation
TB	Tuberculosis
TB-HIV	Tuberculosis and Human Immune Virus
TB DOT	Tuberculosis Directly Observed Therapy
WHO	World Health Organisation

ABSTRACT

Background

TB is ranked second among the leading chronic illnesses in causing morbidity and mortality after HIV the human immunodeficiency virus (HIV). Despite the relative success in the implementation of the DOTS in Uganda, challenges still persist that have hindered the required standards. Rubaga division has registered a significant reduction in the proportion of patients completing treatment from 47% to 31% but this marked with increase in the defaulter rate of 4%. This discrepancy raises questions about the implementation of TB DOT in this division that need immediate answers.

Objective

The main objective of the study was to determine the factors affecting the implementation of TB DOT in Rubaga division as to improve patients' adherence to TB treatment.

Results

A total of 201 patients and three TB clinic in-charges participated in the study. Out of the 201 patients, 66% reported their treatment was being observed by someone. The most commonly (82%) used mode of DOT is relative/family member not community-based treatment supporters. More than half, (53%) of the respondents had taken medication without treatment observers. Staying alone (have no relative/family member) in the house was the main reason why patients were not on TB DOT. Patient with positive attitude towards TB DOT and those in union were more likely to be on TB DOT. Follow-up of treatment observers was poor. Lack of treatment

supporters down in the communities and poor facilitation of health workers were the main barriers affecting their practices during the implementation of TB DOT

Conclusion

Implementation of TB DOT is being done in Rubaga, relatives/ family members are the common treatment observers. Lack of community-based treatment supporters and poor facilitation of health worker are the leading barriers to the implementation of TB DOT in Rubaga division.

Recommendation

There is need for vigorous introduction of community-based treatment supporters to supplement the family members/relatives.

OPERATION DEFINITIONS

Community-based TB DOT; for this study we considered supporting and observing patients TB treatment from the day of treatment until the completion of TB treatment at community level.

A treatment supporter or observer; for this study will any person ranging from a sub-county treatment supporter to a relative or close friend who observes and support patients during their course of treatment at community level.

TB clinic in-charges: for this study was any health worker responsible for the daily running of the TB clinic.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

Pulmonary Tuberculosis (PTB) is caused by a bacterium (*Mycobacterium tuberculosis*) that affects the lungs. PTB is spread from person to person through the air. A person needs to inhale only a few of these germs to become infected. However, pulmonary Tuberculosis is curable and preventable (Organization, 2011a). TB symptoms such as cough, fever, night sweats and weight loss most of the time may be mild for a long period of time (Organization, 2009). This makes patients reluctant in seeking health care resulting in the transmission of the disease. Congestion and poor ventilation are the leading facilitators for the spread of TB (Organization, 2011a, Meintjes et al., 2008).

Urbanization has lead to the influx of many people in towns from rural areas. This has contributed to the rapid population growth in towns resulting in slum populations (Cohen, 2006). The later has contributed to the presence of congestion and poor housing which predispose them to poor ventilation (Davis, 2011, Jiang et al., 2009). According to the UN, 64.1% and 85.9% of the developing and developed world respectively will be urbanized (Cohen, 2003). However, in developing countries this has posed many challenges especially towards the health status of people living in these towns (Njoh, 2003). Communicable diseases are prevalent in these communities, and due to due poverty, poor nutrition and low education levels, these diseases are hard to control. This has lead to persistent morbidity and mortality in many of developing towns (Hay et al., 2005, Donnelly et al., 2005).

The prevalence of TB disease is on increase in many urban setting most especially in developing countries. This has been attributed to the congestion, high poverty levels and the high prevalence of HIV/AIDS that has increased the risk of getting TB (Gandy and Zumla, 2002, Sekandi et al., 2009).

Controlling the spread of TB in developing countries is still a challenge despite a number of strategies adopted. WHO introduced the community-based TB DOT strategy which is being adopted by many countries to control the spread of TB by ensuring patients complete their treatment within the recommended treatment period (Raviglione and Uplekar, 2006).

Community-based TB DOT encourages community participation towards the control of TB through the district and the sub-counties. Patients take their medication in the presence of a treatment supporter who observes that the patient is truly taking the medication. It also creates an interaction between the health care centres with the community. Treatment supporters are educated about the treatment and are supposed to follow and report on patient's progress during the treatment period (Okello et al., 2003).

Implementation of the community-based TB DOTs in urban settings is a likely challenge (Tasnim et al., 2012). Despite the short distances to health centres, people are still poor, congested, some lack relatives or friends to take care of them during the illness and also the demanding pressure within towns. Therefore this study seeks to examine the implementation of the community-based TB DOTs in an urban setting like Rubaga division in Kampala city to determine the factors affecting its implementation so as to inform policy makers.

1.2 Background

Tuberculosis (TB) remains a major health problem both in the developing and developed countries (Organization, 2013a). About one third of the world's population is a victim of tuberculosis (TB) (Sreeramareddy et al., 2009) infection although a small proportion of those infected will become sick with TB disease. Individuals with low immunity for example those with poor nutrition, Diabetes and HIV are at a high risk of developing TB disease prior to being infected with TB bacteria. A person living with HIV is about 20 to 30 times more likely to develop active TB (Organization, 2013b).

TB is ranked second among the leading chronic illnesses in causing morbidity and mortality after HIV the human immunodeficiency virus (HIV) (Liu et al., 2012). According to the WHO 2013 report on TB, it is estimated that over, 8.6 million new TB cases and 1.3 million TB deaths occurred in 2012. By gender, the burden of TB is still high among men than females. In 2012, there were an estimated 2.9 million cases and 410 000 TB deaths among women, as well as an estimated 530 000 cases and 74 000 deaths among children. The high burden of HIV has also impacted on the high prevalence of TB. The same report indicates that over 0.3 million people co-infected with both HIV and TB died in 2012 worldwide (Organization, 2013a).

Over 80% TB cases occur in 22 countries with east-Asia and the pacify region responsible for 58% of the world TB cases in 2012 while the African region accounts for a quarter relative to its population. There has been considerable decline in the notified TB cases by 2011 in a number of individual countries; Brazil and China for example, are among the 22 countries that have demonstrated a sustained decline in TB cases over the past 20 years whereas the TB prevalence in Cambodia fell by almost 45% in 2012 (WHO, 2012).

Tuberculosis mostly affects young adults, in their most productive years with over 95% of cases and deaths occur in developing countries. Sub-Saharan Africa carries the greatest proportion of new cases per population; over 260 cases per 100 000 population in 2011 showing a reduction compared to the incidence by the year 2010; 271 case per 100 000 population (Organization, 2013a).

Despite the large numbers of TB case and deaths, there is a worldwide success in the control of TB since World Health Organization (WHO) declaration of TB as a global public health emergency from 1993(Raviglione, 2003). The TB mortality rate has reduced by 45% since 1990 and TB incidence rates (new cases per 100 000 population per year) are falling in most parts of the world (Organization, 2013a). The 2015 MDG target of halting and reversing TB incidence has been realised, with TB incidence falling globally for several years; 2% per year in 2012. Major success had been attributed to the international rollout of the DOTS strategy for about 18 years back with a cumulative total of 56 million people being successfully treated for TB between 1995 and 2012, saving approximately 22 million lives (Organization, 2013a).

In Uganda TB remains a major public health concern. The 2010 Global World Health Organization Report ranks Uganda as the 16th among the 22 TB high burden countries in the world with an annual incidence of 330 cases of all forms of TB. While new smear positive cases per 100,000 people stand at 136 and the expected caseload per year is estimated to be 102,000 (Organization, 2010).

Like any other sub-Saharan country, Uganda also is facing the problem of TB/HIV co-infection in the population where the prevalence of HIV stands at 6.4%. It is further estimated that over 60% of TB patients have HIV/AIDS with TB the leading cause of death in a number of HIV positive patients (Musinguzi et al., 2009).

Uganda is among the WHO member countries implementing the DOT strategy since its roll-up by the WHO in 1999. The TB DOT was adopted as a national strategy in Uganda in 2000 after a pilot study in 3 districts in 1998. TB DOT was later scaled up to other district in 2005. The with the aim of improving access to TB care, reduce health care seeking costs for the patients with TB and the health system, and to enable patients to stay with their families while receiving TB treatment (Floyd et al., 2002).

After its scale, DOTS produced remarkable improvement in the control of TB. By 2007, there was a drastic increase in the treatment success rate among smear positive TB patients of 13% since 1998 (62% in 1998 to 75% in 2007). Currently, according to the NTLP report of FY 2013/2014 more than half (55%) of the total TB patient on TB treatment are under Directly Observed Therapy (DOT) which shows an improvement compare to that of 2011, (47%).

Despite the relative success in the implementation of the DOT and its importance in the control of TB in Uganda, challenges still persist that have hindered the required standards. Results from a survey done in 114 health facilities in Uganda in 2011 revealed that only 57% of the facilities implemented some form of DOT which was mainly done by clinicians, (50%). Among the reasons for not putting patients on DOT health workers reported inadequate facilitation (76.8%) followed by the lack of an assigned SCHW (21.4%) and patients being inaccessible (21.4%).

The burden of TB disease is on rise in urban settings especially in the low income countries. Due to the high rate of rural to urban migration, this has resulted in rapid population growth of urban settings. According to (Bjerregaard-Andersen et al., 2010) in their survey done in Guinea Bissau it was found out that the TB prevalence was high (134/100,000) among the urban setting of the country whereas in Dakha city, Bangladesh, (Banu et al., 2013) revealed a high prevalence of TB (253/100,000) in the slums of the city.

Kampala city holds about 5% of Uganda's population with a population growth rate of 4.1%; higher than the national average. The rapid population growth has been influenced by rural urban migration than natural population increase (Matagi, 2002). This has lead to the rapid multiplication of many slum communities in the city which now accounts for over 60% of the city population. These slums are a pocket of high HIV prevalence (9.3%), the leading drivers of the TB burden (Darj et al., 2010).

Currently Kampala city is responsible of about 15% to 20% of the Uganda's TB burden. In the financial year 2012/2013 only, 8,784 total patients were notified with TB. However, with support from different organizations; With the TB CARE I support the treatment success rate for Kampala increased from 49% for the 2010 cohort to 69.7% during the last quarter in 2011 (Programme, 2014b).

1.3 Background of study area

Rubaga division is one of the five divisions that make up Kampala city, the capital city of Uganda. The division is administratively divided into North and South, bordered by Kawempe Central and Makindye divisions. The division is estimated to have a population of 438,205 people, served by both public and private health facilities that include hospitals and low level

health centres. The division contains 2 KCCA health facilities but for this study, Kisenyi health centre was added due to its close proximity to Rubaga (on the boarder between Rubaga and central divisions).

1.4 Problem Statement

There is considerable improvement in the control of TB in Uganda. This has been marked with a steady reduction of mortality due to TB from 29% in 2009 to 14% in 2012 (Programme, 2014b). However, this improvement is being dragged behind by the unbelievable defaulter rate of 10% despite the countrywide implementation of TB DOT both at facility and community level. Kampala city alone is responsible for about a fifth of the total TB burden in the country (Programme, 2014b).

According to the available data for the two recent analysed quarters of 2012, Kampala registered an overwhelming increase in the number of patients on TB DOT; from 6% to 29% for the April – June and July – September 2012 quarter reports respectively. However, this improvement does not speak for the still high rates of patients defaulting (17%) and the low treatment completion rates of only 45% (Program, 2014).

From the same report Rubaga division reported the highest number of patients on TB DOT, 70%, and of these 69% were under community based TB DOTS. However, this striking achievement seems not to reflect the significant reduction in the proportion of patients completing treatment from 47% to 31% for the April –June and July – September 2012 quarter reports respectively and also increasing defaulter rate of 4% for the same period. This discrepancy raises questions about the implementation of TB DOT in this division that need immediate answers. Therefore, this

study seeks to examine the implementation of TB DOTS in this division so as to improve the control of TB in the country.

1.5 Objectives of the study

1.5.1 Broad objective

To determine the factors affecting implementation of community-based DOT in Rubaga division, Kampala city

1.5.2 Specific objectives

- I. To determine the level of community-based TB DOT implementation in Rubaga division, Kampala city
- II. To establish the patient related factors affecting the implementation of community-based TB DOT in Rubaga division, Kampala city
- III. To determine the health worker practices affecting the implementation of community-based TB DOT in Rubaga division, Kampala city

1.6 Research questions of the study

1.6.1 General research question

What are the factors affecting implementation of community-based DOT in Rubaga division, Kampala city?

1.6.2 Specific research question

- I. What is the level of community-based TB DOT implementation in Rubaga division, Kampala city?
- II. What are the patients related factors affecting the implementation of community-based TB DOT in Rubaga division, Kampala city?
- III. What are the health worker's practices affecting the implementation of community-based TB DOT in Rubaga division, Kampala city

1.7 Significance of study

The study findings will benefit both the patients and the health workers in identifying the possible reasons of why many patients default their TB treatment a sign that probably the TB DOTS is not well implemented. The finds will also help the policy makers of Kampala city authority to iron out the barriers of implementing TB infection control in their health facilities

1.8 Conceptual frame work

Independent variables

Patient factors

- Knowledge on TB DOT
- Attitude towards TB DOT
- Stigma
- Socio-demographic characteristics

Dependent Variable

Implementation of
community-based TB DOT

Health work practices

- Availability of community TB treatment supporter
- Identification of treatment supporters
- Educating treatment supporters
- Follow-up on treatment supporters

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter describes the literature about the study to demonstrate what is already known and how the new research will attempt to address any gaps. The chapter is split into sections for better description of literature; burden of TB, burden of TB in urban setting, TB control, TB control in urban setting, implementation of community-based TB DOT, implementation of community-based TB DOT in urban and Kampala, Who to provide TB DOT, patient's factors affecting implementation of TB DOT and health worker practices during the implementation of TB DOT.

2.2 Burden of TB

TB is ranked second among the leading chronic illnesses in causing morbidity and mortality after HIV the human immunodeficiency virus (HIV). According to the WHO it is estimated that over, 8.6 million new TB cases and 1.3 million TB deaths occurred in 2012. By gender, the burden of TB is still high among men than females, in the same period, there were an estimated 2.9 million cases and 410 000 TB deaths among women, as well as an estimated 530 000 cases and 74 000 deaths among children (Organization, 2013a). The high burden of HIV has also impacted on the high prevalence of TB. The same report indicates that over 0.3 million people co-infected with both HIV and TB died in 2012 worldwide (Organization, 2013a).

Over 80% TB cases occur in 22 countries. Only east-Asia and the pacify region, are responsible for 58% of the world TB cases in 2012 while the African region is over a quarter relative to its population. There has been considerable decline in the notified TB cases by 2011 in a number of

individual countries (Organization, 2011b); Brazil and China for example, are among the 22 countries that have demonstrated a sustained decline in TB cases over the past 20 years whereas the TB prevalence in Cambodia fell by almost 45% (WHO, 2012).

Tuberculosis mostly affects young adults, in their most productive years with over 95% of cases and deaths occur in developing countries. Sub-Saharan Africa carries the greatest proportion of new cases per population; over 260 cases per 100 000 population in 2011 showing a reduction compared to the incidence by the year 2010; 271 case per 100 000 population (World Bank reports 2011 and 2012 on Incidence of TB).

In Uganda TB remains a major public health concern. The 2010 Global World Health Organization Report ranks Uganda as the 16th among the 22 TB high burden countries in the world with an annual incidence of 330 cases of all forms of TB and 136 new smear positive cases per 100,000 people per year and the expected case load per year of 102,000 was estimated (Organization, 2010).

Like any other sub-Saharan country, Uganda also is facing the problem of TB/HIV co-infection in the population where the prevalence of HIV stands at 6.4%. It is further estimated that over 60% of TB patients have HIV/AIDS with TB the leading cause of death for a number of HIV positive patients (National HIV Behavioral Sero-Survey 2005).

2.3 TB in urban setting

The burden of TB disease is on rise in many urban setting especially in the developing countries. Due to the high rate of rural to urban migration, this has resulted in rapid population growth of urban settings fueling the rapid multiplication of slum communities characterized by poverty, poor housing and congestion (Tannerfeldt and Ljung, 2006). According to (Bjerregaard-

Andersen et al., 2010) in their survey done in Guinea Bissau it was found out that the TB prevalence was high (134/100,000) among the urban setting of the country. In Dakha city, (Banu et al., 2013) revealed a high prevalence of TB, (253/100,000) in the slums of the city.

In Uganda, Kampala city holds about 5% of the country's population with a population growth rate of 4.1% higher than the national average. This has led to the rapid growth of many slum communities in the city which now accounts for over 60% of the city population. These slums are a pocket of high HIV prevalence (9.3%), the leading drivers of the TB burden (Sekandi et al., 2009, Guwatudde et al., 2003, Programme, 2014b) .

Currently Kampala city is responsible of about 15% to 20% of the Uganda's TB burden. In the financial year 2012/2013 only, 8,784 total patients were notified with TB (Programme, 2014b). However, with support from different organizations; With the TB CARE I support the treatment success rate for Kampala increased from 49% for the 2010 cohort to 69.7% during the last quarter in 2011(Programme, 2014b).

Despite the increasing burden of TB in urban centres, the level of knowledge about TB is relatively high among urban dwellers compared to the rural counterparts. The high knowledge prevalence has been attributed to the presence of media and increased access to information in urban areas than rural (Minnery et al., 2013).

According to (Tasnim et al., 2012) in their study of the patient's knowledge and attitude towards tuberculosis in an urban setting, revealed knowledge about cause and treatment of tuberculosis among TB patients was quite good in Dhaka metropolitan city, despite the existing misconceptions about transmission of disease like sharing utensils for food or drink. The same findings were revealed by (Obuku et al., 2012) in their study of Socio-demographic

determinants and prevalence of Tuberculosis knowledge in three slum populations of Uganda; over half of the participants knew how TB is transmitted—through air borne with more than a quarter still believing that someone can get TB by sharing dishes.

2.4 Implementation of DOTS

Uganda is among the WHO member countries implementing the DOTS strategy since its roll-up by the WHO in 1999. The DOT was adopted as a national strategy in Uganda in 2000 after a pilot in 3 districts in 1998. TB DOT was later scaled up to other district in 2005. The with the aim of improving access to TB care, reduce health care seeking costs for the patients with TB and the health system, and to enable patients to stay with their families while receiving TB treatment.

After its scale, TB DOT produced remarkable improvement in the control of TB. By 2007, there was a drastic increase in the treatment success rate among smear positive TB patients of 13% since 1998 (62% in 1998 to 75% in 2007) (Uganda, 2010). Currently, according to the NTLP report of FY 2013/2014 more than half (55%) of the total TB patient on TB treatment are under Directly Observed Therapy (DOT) which shows an improvement compare to that of 2011, (47%) (PROGRAMME, 2014a).

Despite the relative success in the implementation of the DOTS and its importance in the control of TB in Uganda, challenges still persist that have hindered the required standards. Results from a survey done in 114 health facilities in Uganda in 2011 revealed that only 57% of the facilities implemented some form of DOTS which was mainly done by clinicians, (50%). Some health facilities lacked Sub-county health workers (SCHW), 22%. Among the reasons for not putting patients on DOTS health workers reported inadequate facilitation (76.8%) followed by the lack

of an assigned SCHW (21.4%) and patients being inaccessible (21.4%) (PROGRAMME, 2014a).

2.5 Implementing CB-TB DOT in urban setting

The management of TB patients in large hospitals and health centres located in urban areas poses special challenges. The advantage of shorter distances from the health facilities is unfortunately counteracted by many factors: i) the higher cost of services, ii) the overcrowding of out-patient departments and hospital wards, iii) the de facto lack of coordination between private and public sector and iv) the frequent absence of an extended family who can support the patients and their closest relatives during the time of sickness (Uganda, 2010).

As a result, patients can hardly afford to be admitted even for a few days. Further, the majority of patients stop the treatment because of the unaffordable prices of anti-TB drugs in private pharmacies (Uganda, 2010, Russell, 2004, Kemp et al., 2007). This poses extremely serious immediate threats to the health of the patients and their families and increases the transmission of TB in an environment that is obviously more populated than the rural areas. Despite all these constraints, the anti-TB treatment must still be observed, completed and evaluated for the sake of curing the patient and controlling TB.

As the social structure and the organization of the health services in large cities are different from that of rural areas, the implementation of DOT must follow different steps.

When implemented in urban settings, DOT improves TB service delivery by involving public and private health care providers in TB control efforts. Specifically, our teams work alongside national TB programs and local stakeholders to train city-based health facility staff to identify

individuals with TB symptoms, provide timely TB testing and treatment, supervise patients' medication intake, and accurately register and report TB-related data.

2.6 Implementing TB DOT in Kampala

There is considerable improvement in the control of TB in Uganda. This has been marked with a steady reduction of mortality due to TB from 29% in 2009 to 14% in 2012 (PROGRAMME, 2014a). However, this improvement is being dragged behind by the unbelievable defaulter rate of 10% despite the countrywide implementation of TB DOT both at facility and community level. Kampala city alone is responsible for about a fifth of the total TB burden in the country (PROGRAMME, 2014a).

According to the available data for the two recent analysed quarters of 2012, Kampala registered an overwhelming increase in the number of patients on TB DOT; from 6% to 29% for the April – June and July – September 2012 quarter reports. However, this improvement does not speak for the still high rates of patients defaulting (17%) and the low treatment completion rates of only 45% (Program, 2014).

From the same report Rubaga division reported the highest number of patients on TB DOT, which is 70%, and of these 69% were under community based TB DOTS. However, this striking achievement seems not to reflect a significant increase in the number of patients completing treatment neither reducing the defaulting rate; Rubaga registered a significant reduction in the proportion of patients completing treatment from 47% to 31% for the April – June and July – September 2012 quarter reports respectively with a marked increase in the defaulter rate of 4% for the same period (Program, 2014).

2.7 Who to provide TB DOT

According to the WHO, supervision of TB treatment must be carried out in a context-specific and patient-sensitive manner that should ensure adherence of both parties (the patient and the treatment supporter) to every detail of DOT and so as to maximize its benefit. Supervision may be done using different approaches depending of on a particular country. It can be at health facility, in the workplace, in the community or at home. Different studies have been carried out to determine the most appropriate approach as to control TB through ensuring that all patients complete their treatment successfully. According to Minnesota Department of Health, TB DOT should be delivered by nurse or supervised outreach under a health facility or home care agencies, correctional facilities, treatment centers, schools, employers, which should be under the guidance of the local health facility. However, Minnesota Department of Health does not recommend family members to deliver DOT as they are likely not to keep it objective.

(Akhtar et al., 2011) in their cohort analysis of directly observed treatment outcomes for tuberculosis patients in urban Pakistan, when comparing the two approaches of treatment observation, they discovered that patients observed by family members had lower cure rates compared to those at clinics.

In other studies, (van den Boogaard et al., 2009) in their study to compare community and facility-based directly observed treatment, they found out that community-based approach was associated with higher treatment success rates than the facility based; Treatment success rates were respectively 81% and 70% in patients under community vs. facility-based DOT ($P < 0.001$).

In a study about directly Observed Therapy and Improved Tuberculosis Treatment Outcomes in Thailand to compare treatment outcomes at the end of two months on treatment, (Anuwatnonthakate et al., 2008) discovered that 98% of patients that received health care worker (HCW) DOT remained on treatment at two months compared with 86% patients that received self administered treatment (SAT) (adjusted OR [aOR] 3.8; 95% confidence interval [CI] 2.4–6.0) and 95% patients that received family DOT (aOR 2.1; CI, 1.4–3.1).

In regard to the cost-effectiveness of these approaches, different studies have shown that some approaches are pocket friendly when compared to others. According to (Tolib N Mirzoev 2008) in a study to compare the cost effectiveness of community and family based TB DOT, the study revealed that The CBD strategy was more cost-effective than the FBD strategy: recurrent costs per successful treatment were US\$91.8 and US\$102.2 respectively with a total recurrent costs per patient using the CBD and FBD strategies were US\$76.2 and US\$84.1 respectively. The team also indicated that the social costs incurred by patients and their supervisors represent more than a third of total recurrent costs under each strategy, 37% and 35% respectively.

2.8 Patient factors affecting the implementation of TB DOT

Patients' factors affecting the implementation of TB DOT can be categorized into Socio-demographic characteristics, Attitude, level of knowledge and stigma.

2.8.1 Socio-demographic characteristics

A number of studies have indentified patients' age as a key factor in determining the level of compliance as well as completion of TB treatment. According to, (Bam et al., 2006) in their study of factors affecting the adherence to TB DOT in the urban setting in Nepal, they discovered that the young patients were more likely to adhere to TB DOT than the older one.

This was attributed to the fact that older patients are of working age that requires them to be mobile than young ones. (Cayla et al., 2004) in their study to determine the current status of treatment completion and fatality among tuberculosis patients in Spain they found out that age was not associated with defaulting on TB treatment.

2.8.2 Attitude towards TB DOT

Patient's attitude has also been indicated in a numbers of studies as a key factor affecting their adherence to TB treatment. (Mweemba et al., 2008) in their study of patients' compliance to TB treatment in Zambia they found out that patients with poor attitude towards TB DOT were more likely to be non-compliant to treatment than those with good attitude. Stigma and patient's perception towards TB treatment have been found to greatly affect their attitude towards TB treatment(Crann et al., 2010).

Patients with high stigma are likely to have poor attitude towards TB DOT. Whereas patients whose perception is poor they are less likely to be on TB DOT. Other studies have pointed out level of knowledge the patient have on TB treatment to affect their attitude towards seeking TB care as well as TB medication. Patients with high level of knowledge are likely to have good attitude towards TB DOT and at the same time good complaints to TB DOT (Mangesho et al., 2007).

2.8.3 Level of knowledge

A number of literatures have revealed that the level of knowledge patients have on TB DOT will determine their compliance to treatment and their adherence to TB DOT. Patients have defaulted on TB treatment because many do not know that taking medication daily is paramount in the curing of TB. (Tachfouti et al., 2011) in their study to describe the impact of knowledge and

attitudes toward TB on treatment adherence in Morocco, they concluded that there was poor level of knowledge about TB among non adherent patients. Patients reported that feeling a sensation of cure was the main reason why they stopped taking medication.

(Muture et al., 2011) in a study to determine the duration tuberculosis patients stay on treatment before defaulting and factors associated with default in Nairobi also revealed that defaulting was associated with inadequate knowledge was associated with defaulting, recommending continuous education of patients on TB treatment.

However, the knowledge of the service provider also affect patient's adherence to TB DOT. According to (Bristow et al., 2013) in a study to describe the knowledge, attitudes, and practices of TB program personnel involved with tracing activities of TB patients, they revealed that only 59% of the tracers new the four components of each DOT visit encounter with the patient.

2.8.4 Stigma

Stigma is one of the leading factors affecting the treatment of TB. Many TB patients have failed to complete their treatment due to the fear to be seen by any other person when they come back for treatment. In the same scenario, many have failed to have treatment observers of the fear that these people will come to know that they TB (Dodor et al., 2008). Different studies have been carried out to determine the effect of stigma on patients' adherence to the different approaches of TB DOT.

According to (Katamba et al., 2005) in a study to determine the patient perceived stigma associated with community-based TB DOT in Uganda, they found out that patients on community-based DOT (CB-DOT) were more likely to believe that neighbours knew they had TB compared to patients on self administered treatment (SAT) (91% vs. 62%, $p < 0.001$). the

study further indicated that although there was a very big difference in the belief, patient in the two groups did not differ in their perception that neighbours thought they have HIV because of TB (46% vs. 46%, $p = 0.954$).

2.9 Health worker practices during implementation of TB DOT

2.9.1 The common TB DOT approaches used

WHO recommends that a treatment observer should be acceptable to the patient and objective to completion of TB treatment. Depending on the locality a decision must be made between the patient and the health worker on which TB DOT approach to be used during treatment. Failures to involve the patient in decision making it will automatically affect the adherence to TB DOT. In the study done in Tanzania to improve patient's adherence to TB treatment by letting them have a choice on which approach of TB DOT (Mkopi et al., 2013) revealed that 25.2% of TB patients were not given a choice about the place of treatment by health workers, and only 13.7% of those given a choice reported that they were given adequate time to make their decision.

2.9.2 Follow-up of treatment observers

According to the MOH and WHO guide lines it is recommend that periodic follow-up on the patient and the treatment observers to monitor the progress of the patient and also to capture more information on the treatment should be done by health workers. It is very important since it helps in correctly them mistakes both the patient and the treatment observer are likely to do as early as possible. It also helps in providing continuous education to the two parties. Studies have been done to determine health worker practices during follow-up visits and according to (Mkopi et al., 2013) in their study to improve patient's adherence to TB treatment by letting them have a choice on which approach of TB DOT, the findings revealed that although health workers

reported to have received patients on follow-up, only 20% of the health workers took an initiative to check patients' cards

2.9.3 Education of treatment observers

Providing information to TB patients is a key factor in improving their attitude and breaking the beliefs that would affect the control of the disease. Educating TB patients and their treatment observers is mainly the responsibility of health workers as it ensures that patients get all the information that would help to keep them on their treatment.

In a study to improve patient's adherence to TB treatment by letting them have a choice on which approach of TB DOT, (Mkopi et al., 2013) revealed that only 24.3% of treatment supporters confirmed that they received information from health workers to complete patients' treatment cards. In the same study although health workers agreed that proper health education was favoring successful completion of TB treatment in over 45.7% on treatment, only 20.0% of health workers reported to have checked patients' treatment cards.

Failures to provide TB information patients are likely not to adhere to their treatment and in the end they become defaulters a source of MDR-TB. In a study about adherence to TB DOT, (Bam et al., 2006) found out that non-adherent patients did not know that they were supposed to take medication daily and this was because they were not educated on how and when to take their medication.

In many settings health workers lack updated information about TB and this affects their confidence in educating patients. In Nigeria, (Ibrahim et al., 2014) in a study to determine the factors that affect adherence to treatment among patients undergoing direct observation of TB treatment, they recommend continuous training of health workers on patient education. The same

recommendation was given by (Wynne et al., 2014) in a study to explore knowledge and stigma around HIV, TB and TB/HIV co-infection in western Uganda.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter describes the methods of how the study was carried out. It includes the study design, population, sample, study area, sources of data, study variables, data tools, how the quality of data was maintained, the plan for analysis ethical considerations and limitations of the study.

3.1 Study design

It was a descriptive and cross-sectional study that included collection of both qualitative and quantitative data.

3.2 Sources of data

Data was gotten primarily by interviewing both TB patients and health workers in the TB clinics as respondents. Data was collected from three health; Kawala, Kitebi and Kisenyi. Kisenyi health centre is not part of Rubaga division but was included in the study due to its close proximity to Rubaga division that many patients from this division seek their health services from this health facility.

3.3 Study population

The study included TB patients on treatment living in Rubaga division and also in-charges working in TB clinics of KCCA health centres of Rubaga division.

3.4 Inclusion and exclusion criteria

3.4.1 Inclusion criteria

Patients diagnosed with pulmonary TB and have been on TB treatment for at least 8 weeks but not more than 20 weeks were eligible for the study. The patient should be receiving TB treatment from the 3 KCCA health centers of Rubaga division.

3.4.2 Exclusion criteria

Patients who were weak and unable to talk and those who could not speak Luganda or English were not included in the study. Incapacitated patients like the deaf and the dumb did not participate in the study. Patients who were on re-treatment were also not included in the study due to the likelihood of behaviour change during the second time of treatment. Patients regarded as transfer in were not included in the study because these were likely to be different from those who started their treatment at that particular clinic.

3.5 Sample size determination

3.5.1 Quantitative data

The sample size was determined using Kish and Leslie formula. This formula was used because according to the last quarter data analyzed (July to September 2012) the proportion of TB patients under CB-TB DOT was known. Then sample size was adjusted to the total number of patients reported to be on TB treatment by June 2014 in Rubaga division.

$$n = \frac{z^2 pq}{e^2} = \frac{1.962 \times 0.69 \times 0.31}{0.05 \times 0.05}$$
$$n = 328$$

Where,

P=69% was the proportion of patients reported to be under community-based TB DOT by September 2012 (KCCCA, quarterly report 2014)

The precision e =0.05

Then the sample size was adjusted according to the total number of patients on TB treatment by June 2014 using the formula.

$$n = \frac{no}{1 + \frac{(no-1)}{N}} = \frac{328}{1 + \frac{(328-1)}{515}}$$

Sample size, n =201

Where,

no= 328, is the calculated sample size by proportional of 69%

N=515, is the current estimated number of TB patients on treatment by June 2014 according to the TB focal person Rubaga division.

The sample size was further calculated proportionate to the reported number of patients expected to be on treatment in the 3 health centres in Rubaga division.

Table 1 showing the expected number of patients to be interviewed from the KCCA health facilities in Rubaga division

Name of facility	Reported number of TB patient on treatment	calculated sample size
Kisenyi	287	112
Kawala	71	28
Kitebi	157	61
Total	515	201

3.5.2 Qualitative data collection

All in-charges of TB clinics in the three KCCA health facilities in Rubaga division were purposively selected for Key informant interviews. This was because they are likely to be more knowledgeable on day to day running of TB treatment in these clinics.

3.6 Sampling procedure

3.6.1 Selection of patients

Selection of patients for interviews was done by use of systematic sampling. In-charges of the TB clinics were requested to give an average number of patients that attend the clinic on a typical clinic day. This total was divided by the sample size from which the sampling interval was calculated. On their way out of the TB clinic, patients were counted and the 4th person was selected for interviews. If the patient selected was not eligible or declined to participate in the study, counting was done again. This was done until the required number of patients in interviewed was gotten.

3.6.2 Selection of health workers for Qualitative data collection

In-charges of the TB clinics were purposively selected. This is because the in-charges were more likely to give the appropriate information about the TB DOT services in these clinics.

3.7 Study variables

3.7.1 Independent variables

Implementation of community-Based TB DOT

3.7.2 Dependent variables

- I. Patient factors
 - Knowledge on TB DOT

- Attitude towards TB DOT
- Stigma
- Socio-demographic characteristics

II. Health work practices

- Availability of community TB treatment supporter
- Identification of treatment supporters
- Educating treatment supporters
- Follow-up on treatment supporters

3.8 Data collection techniques

3.8.1 Quantitative data

Quantitative data was collected using interviewer administered questionnaires. These were chosen because they could help us collect data which could be representative of the TB patients in Rubaga division.

3.8.2 Qualitative data

Qualitative data was collected using key informant interviews. These were chosen due to the fact that the information needed for the study could be provided by one person who is knowledgeable about the day to day activities of the TB clinic; and in this case the in-charge of the clinic or any other person delegated to answer the questions was considered for the interviews.

3.9 Data collection tools

3.9.1 Quantitative data

Quantitative data from patients was collected by use of interviewer administered questionnaire with the assistance of research assistants.

3.9.2 Qualitative data

A key informant interview guide was used in the collection of qualitative data from the in-charges of TB clinics.

3.10 Quality control

Questionnaires were translated in Luganda to avoid false translations that may lead to inconsistent data. The research assistant were trained through the tools and also equipped with data collection skills. Data collection tools were pre-tested to find out any inconsistent or any missed important questions. Study tools were cross-checked and edited by the research assistant immediately after they have been answered by the respondent to ensure no missing data.

3.11 Plan for analysis

3.12.1 Quantitative data

For study objectives one and two, exploratory analysis was done on all variables to detect any missing and any data inconsistencies. Descriptive analysis was also done on all variables to determine the proportions and for continuous data variables, the means and their standard deviations (SD) were calculated. Data was presented in tables and figures as shown in the results section.

For study objective two, the outcome was patient being on TB DOT, measured as binary; on TB DOT or Not. Poisson regression model was used to estimate the incidence risk ratios (IRR) and their 95% confidence interval for being on TB DOT comparing them with the independent variables and robust standard errors were estimated. The Poisson regression model was used because the outcome of interest was more than 10%. All variables in the bi-variate analysis with

$p < 0.05$ or potential confounders were included in the multi-variate analysis. All statistical analyses used Stata version 12.

3.12.2 Qualitative data

For study objective three data collected from key informant interviews was transcribed from the audio recordings. Data was divided into meaningful analytical units and marked with descriptive words merged into larger categories and themes. Content from each coded groups was summarized and illustrated with direct quotes from the discussion.

3.12 Ethical consideration

The study was approved by the IHSU student research review board. Permission was gotten from the Kampala city authority and the in charges of health facilities. Patients were explained to all the details of the study including confidentiality of their information they provided and also signed informed consent before participating in the study.

3.14 Potential limitations of the study

In this study we only collected data from in-charges of the TB clinics and we did not collect from the rest of health workers who may in most cases are operational in the running of the clinic. This may have affected the findings about the health workers practices during the implementation of TB DOT from the time the patient is diagnosed with TB to the time the patient completes treatment.

In this study we stretched the eligibility criteria from 8 weeks to 20 weeks although 8 weeks would have been okay to reduce the recall bias when patients are answering some questions that required recalling. This was done because we had limited time for data collection since patients at 8 months would take us a long time to get them.

Findings for this study do not include views from people like deaf or people with disabilities that affect their cognitive functioning and those who could not speak English or Luganda. This may affect the representativeness of these findings to all TB patients in Rubaga division.

CHAPTER FOUR

RESULTS

4.0 Introduction

This chapter presents the results of the study presented under the following sections; according to the study objective; demographic characteristics of respondents, level of community-based TB DOT implementation in Rubaga division, patient factors affecting the implementation of community-based TB DOT and the health worker practices during the implementation of community-based TB DOT.

4.1 Descriptive analysis

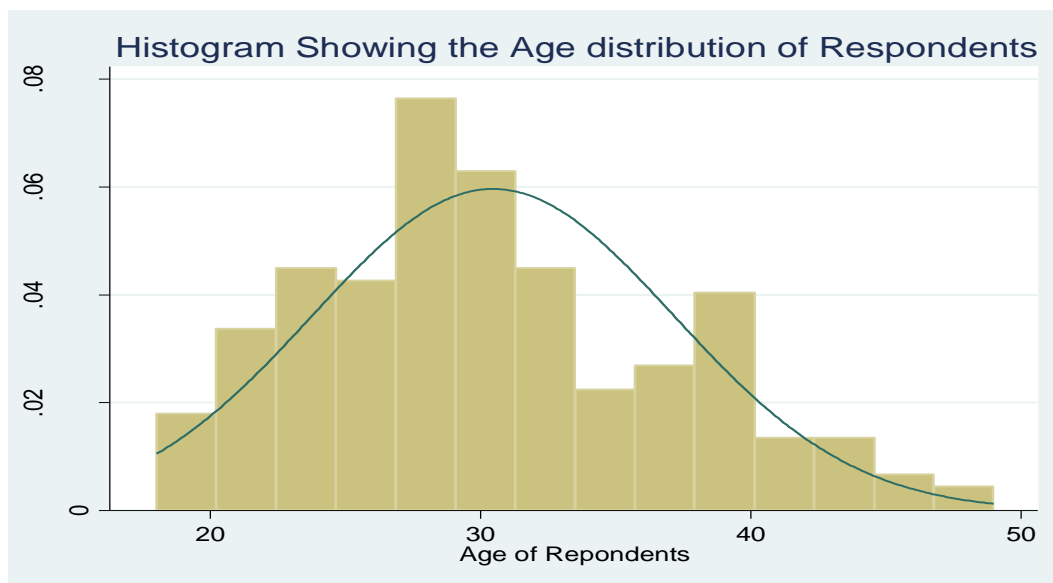
4.1.1 Demographic characteristics of study participants

According to figure 1, the mean age of respondents was 30 years ($SD=7$). From table 2, more than half, (58%) of the participants were males, single (never married, widowed or divorced). The most common level of education was primary and the majority, (34%) of the respondents was earning nothing at the time of the study, meaning they were dependants.

Table 2 showing the demographic characteristics of study participants

Variable	Frequency (n=201)	Percentage (%)
Sex		
Male	116	58
Female	85	42
Age		
18-24	42	21
25-31	57	28
32-38	38	19
39 and above	64	32
Being in union		
Single	116	58
Married	85	42
Education level		
None	17	8
Primary	73	36
Secondary	90	45
Tertiary/university	21	11
Income		
None	67	34
<5000	16	8
50,000-200,000	40	20
200001-500,000	65	33
500,001 and above	9	5

Figure 1 showing the age distribution of respondents



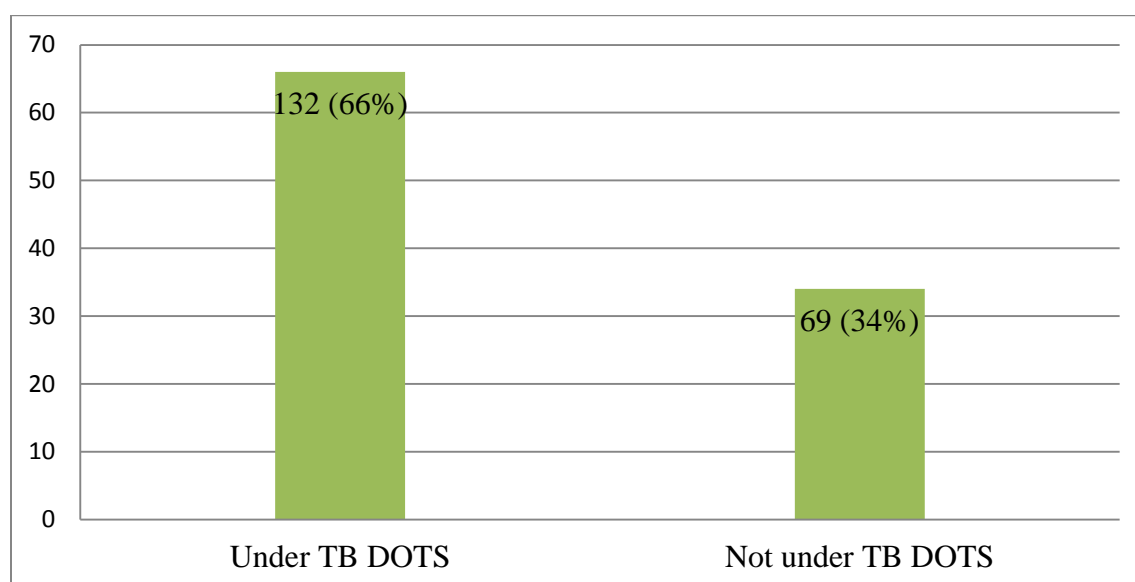
4.1.2 The level of community-based TB DOT implementation in Rubaga division

This was described in terms of; the proportion of patients on TB Dots, the frequency of treatment observation, education of treatment observers, the relationship the patient has to the treatment observer and why some patients are not on TB Dots.

4.1.2.1 Proportional of patients on TB Dots

From figure 2, majority, 66% of the respondents reported that their treatment was being observed.

Figure 2 showing the proportion of patients on TB Dots



4.1.2.2 Frequency of treatment observation, education of treatment observers, their relationship to the patient

From table 3, out of those patients who reported being on TB DOT (figure 2) more than three quarters (86%) of the patients reported that they are observed daily when taking their medication. The most common relationship between the treatment observer and patient was being a relative (brother sister, wife, husband, grand and others).

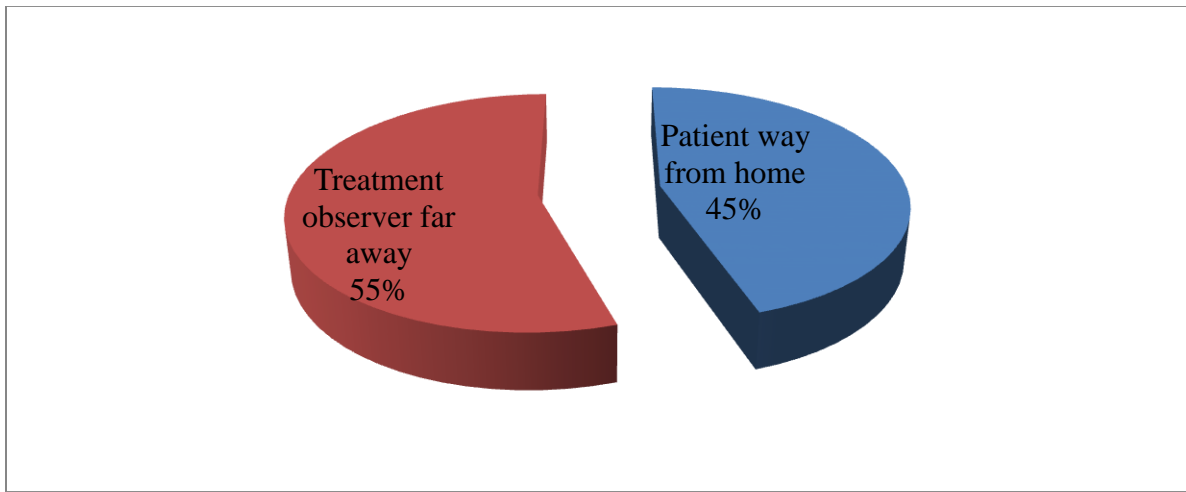
Table 3 showing the frequency of treatment observation, education of treatment observers and their relationship to the patient

Variable	Frequency (n=132)	Percentage (%)
Observing patients daily		
Sometimes	18	14
Always	114	86
Educated treatment observer		
Yes	103	79
No	28	21
Relationship to treatment observer		
Friend	15	11
Relative	108	82
Community Treatment supporter	9	7
Taking medication without observer		
Yes	70	53
No	62	47

4.1.2.3 Reasons why patients take TB medication without treatment observers

From figure 3, out of those participants that agreed to have taken medication without their treatment observers in table 3, more than half, 35 (55)% of respondents reported that at times the observers are far away from their homes, meaning they cannot wait for them.

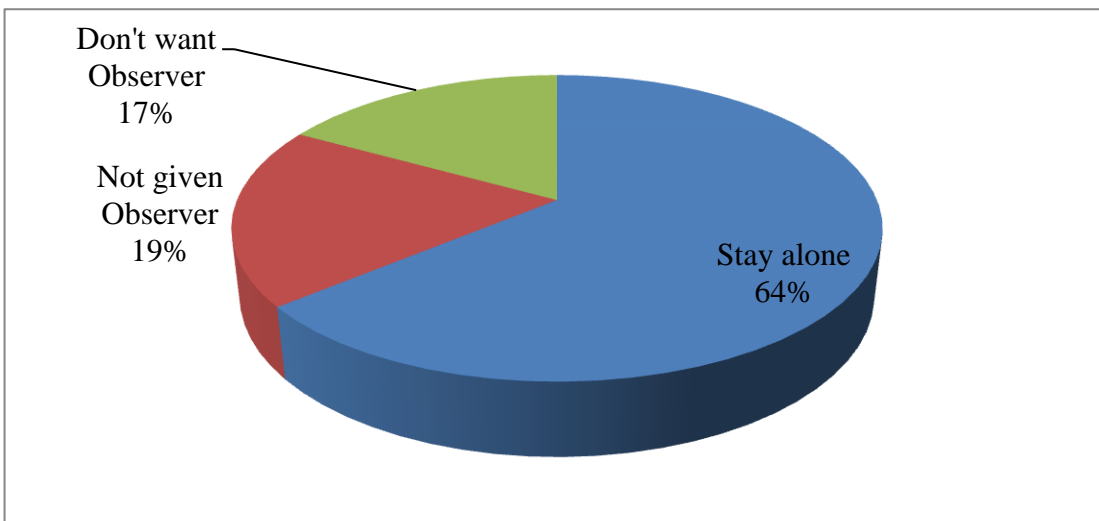
Figure 3 showing the Reasons why patients take TB medication without treatment observers



4.1.2.4 Reasons why patients are not on TB Dots

From figure 4, the most common reason why patients do not have treatment supporter/observers was being that they were alone in their homes. However, surprisingly almost two patients in ten did not want to have a treatment observer.

Figure 4 Showing Reasons why Patients do not have treatment observer



4.1.3 Patient related factors affecting the implementation of community-based TB DOT

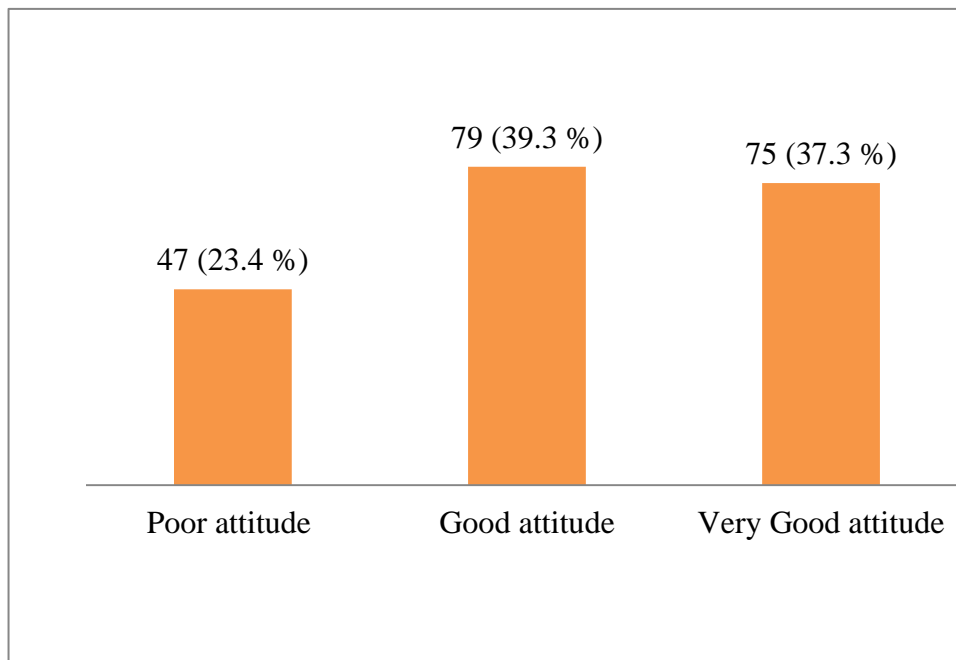
For patient related factors, the study focused on socio-demographic characteristic, the attitude patients have towards TB DOT and the stigma around TB as well as TB DOT.

4.1.3.1 Attitude of patients towards TB DOTs

Attitude was measured on a scale of zero to four. An individual was categorized to be having a very good attitude if he or she scored four, good attitude if scored 2-3 and poor attitude if they score 0-1. Using four statements patients were required to answer in either a positive way or negative way. Scores zero and one were given; zero was given if the interpretation of the respondent's answer was negative and for one, if vice versa.

From figure 5, almost a quarter (24%) of the respondents was found to have poor attitude towards being observed when taking their TB treatment.

Figure 5 showing the Patients' attitude towards TB DOT

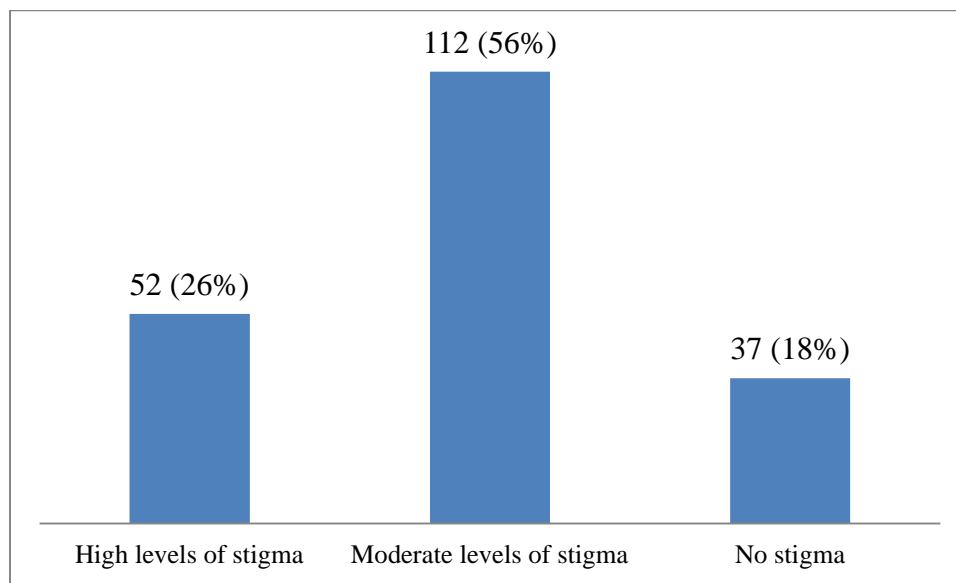


4.1.3.2 Stigma associated TB DOTS

Stigma was measured on a scale of zero to three. An individual was categorized to be having very high levels of stigma if he or she scored zero, moderate levels of stigma if scored 1-2 and no stigma if they scored three. Using three statements patients were required to agree or disagree and scores zero and one were given; zero was given if the respondent agreed to the statements and scored one, if they disagreed.

From figure 6, more than a quarter (26%) of the patients still have stigma associated with TB DOTS.

Figure 6 showing patient's stigma associated with TB DOT



4.1.4 Patient reported health worker practices during the implementation of community-based TB DOT

From table 4, majority of the patients (64%) reported no follow-up by health workers on their treatment observers. However, more than eight out of ten reported that they received information on the importance of TB Dots during the course of TB treatment.

Table 4 showing the patient reported health worker practices during the implementation of community-based TB DOT

Variable	Frequency (n=201)	Percentage (%)
Patient requested to bring treatment observer		
Yes	127	63
No	74	37
Tell Patients the importance of TB DOTS		
Yes	165	82
No	36	18
Follow-up on treatment observers		
Yes	72	36
No	129	64

4.2 Bi-variate analysis

4.2.1 Patient's demographic characteristics factors affecting the implementation of community TB DOTS

From table 5, both age and marital status of the patients affected their being under TB DOTS. Respondents of age ranges, 32-38 and 39 and above were more likely to be under TB DOT than the younger ones. Those in union (married) were 1.4 times more likely to be under TB DOT than the singles.

Table 5 showing the bi-variate analysis of demographic characteristics affecting the implementation of community-based TB DOT

Variable	Patients TB DOT status	P-value
	IRR (Confidence interval)	
Sex		
Male	1	
Female	1.0 (0.8-1.3)	0.722
Age		
18-24	1	
25-31	0.8 (0.7-1.1)	0.152
32-38	0.7 (0.5-0.9)	0.020**
39 and above	0.7 (0.6-0.9)	0.015**
Marital status		
Single	1	
Married	1.4 (1.2-1.7)	0.001**
Education level		
None	1	
Primary	1.0 (0.6-1.6)	0.995
Secondary	1.3 (0.8-2.0)	0.278
Tertiary/university	1.4 (0.8-2.2)	0.230
Income		
None	1	
<5000	0.8 (0.5-1.3)	0.347
50,000-200,000	0.8 (0.6-1.1)	0.138
200001-500,000	1.0 (0.8-1.2)	0.761
500,001 and above	1.3 (1.0-1.7)	0.097

** Statistically significant at 0.05

4.2.2 Patient's attitude stigma and reported Health worker practices

From table 6, patients' attitude and stigma effects their being on TB DOT; being on TB DOT increased with increasing positivity in attitude while for stigma, being on TB DOT increased with reducing stigma. However, patients who reported to have not received information about the importance of TB DOT from health workers were 0.8 times less likely to be on TB DOT than

their counterparts but this was not statistically significant; IRR= 0.8 , CI =0.6-1.1 , p-value= 0.118.

Table 6 showing the bi-variate analysis of Patient’s attitude, stigma and reported Health worker practices

Variable	Patients on TB DOT	p-value
	IRR (confidence interval CI)	
Attitude		
Poor attitude	1	
Good attitude	2.0 (1.3-3.1)	0.003**
Very good attitude	2.8 (1.8-4.3)	0.000**
Stigma		
High levels of stigma	1	
Moderate levels of stigma	1.4 (1.0-1.8)	0.047**
No stigma	1.6 (1.2-2.2)	0.003**
Health worker requested for treatment observer		
Yes	1	
No	0.7 (0.5-0.9)	0.003**
Give Patients information on the importance of TB DOTs		
Yes	1	
No	0.8 (0.6-1.1)	0.118
Follow-up on treatment observers		
Yes	1	
No	0.7 (0.5-0.9)	0.004**

** Statistically significant at 0.05

4.3 Multivariate analysis

4.3.1 Factors affecting the implementation of community –based TB DOTs.

From table 7, patient age, marital status and attitude towards TB DOTs are the factors affecting the implementation of community-based TB DOTs.

Table 7 showing the multivariate analysis of factors affecting the implementation of community –based TB DOTS

Variable	IRR (CI)	p-value
Sex		
Male	1	0.917
female	1.0 (0.8-1.2)	
Age		
18-24	1	
25-31	0.8 (0.6-0.9)	0.014**
32-38	0.7 (0.5-0.9)	0.009**
39 and above	0.7 (0.5-0.9)	0.001**
Marital status		
Single	1	
Married	1.4 (1.1-1.6)	0.001**
Attitude		
Poor attitude	1	
Good attitude	1.7 (1.1-2.6)	0.014**
Very good attitude	2.4 (1.6-3.6)	0.000**
Stigma		
High levels of stigma	1	
Moderate levels of stigma	1.2 (0.9-1.5)	0.275
No stigma	1.2 (0.9-1.6)	0.190
Health worker requested for treatment observer		
Yes	1	
No	0.9 (0.6-1.2)	0.408
Tell Patients the importance of TB DOTS		
Yes	1	
No	1.1 (0.7-1.2)	0.782
Follow-up on treatment observers		
Yes	1	
No	0.9 (0.6-1.4)	0.755

** Statistically significant at 0.05

4.4 Qualitative data

A total of three key informant interviews were conducted from in-charges of TB clinics and these were all females. In-charges were from Kawala, Kisenyi and Kitebi Health centre (all KCCA health facilities). Key informant interviews were carried out to determine health worker

practices during the implementation of TB DOT and challenges and solution to improve community-based TB DOT.

4.4.1 Procedure of putting patients on TB DOT

All in-charges reported that as soon as the patient is diagnosed of TB, he/she is requested to bring a treatment supporter who in most cases is a relative. It is upon the patient to bring one, since the health facility cannot get them one. For those who come, they are educated on how to do the observation. For those who do not come, patients are requested to bring their phone contacts so that at any time they can be contacted about the progress of the patient.

In-charges did not talk about the presence of community treatment supporters to whom they can hand over the TB patients.

“It’s all about the patient to bring someone to help him/her during the treatment course. We cannot do much, we cannot be with them in their houses and there is no other option unless they bring their relatives or close friends. If they do not bring one it’s very hard for us to get them any because we do not know any community treatment supporters down in communities”, one of the in-charges stated.

4.4.2 Follow-up on treatment observers

All in-charges reported that following –up treatment observers is a hard task. They stressed that majority of observers do not have time to come to health facilities especially if they the patients are not too sick. This makes them rely on the patients’ information they tell them when they come for re-fills. In such scenarios, they report that the patient may decide to tell lies about their treatment. They also added that despite the fact that they are the contacts of treatment observers, it is hard to call them because most of the time they do not have airtime to make calls.

“For those patients who have treatment observers it is also another task to have them come to health facility. We are in a very competitive world where people are looking for what to eat. So makes it hard for them to spend hours coming to us for several visits. In the end we trust all what patients are telling us which is very dangerous in most cases”, the in-charge reported.

4.4.3 Challenges face while implementing TB DOT

It was reported by all in-charges that the most challenging factor in the implementation of TB DOT is that many of the TB patients stay alone in their houses. That is, they do not have relatives. This limits their options of getting treatment observers.

“Here in Kampala people come from different areas looking for jobs. Many do not have relatives and they leave in very poor conditions. Unfortunately, people of this category take a very big proportion of our patients. So you find yourself in a fix because no one is there for this patient. However much we try the only option is to trust this patient although in many cases they default the treatment”, the in-charges reported.

The second challenge raised was, lack of treatment supporters down in the community although this has been effort of many programs. This would have been an option to those with no family members.

“Like I already told you, many of our patients are poor, lonely struggling for survival here in Kampala. So when they get sick they lose everything, no one is there for them. They need the care! But we at health facilities we try to play our part but down there the monitoring of the patient is not there. Even if this patient has failed to come to health facility it will take a long time to find out what was the reason until they are able to come to the health facility. If we had

people down in the communities helping in this case, patients mainly those leaving alone would benefit,” the in-charges reported

The poor attitude of fellow health workers towards TB has lead to small number of staff working in the TB clinic. This increases workload to the few staff which in the end affects their performance.

“Many of us here if you tell them to chose where they would work in this health facility; you may be surprised that no one will chose the TB clinic. People do not want to work in TB, this leaves few health workers allocated to the clinic. In the end you find that this compromises on our efficiency,” the in-charge stated.

4.4.4 Solutions to challenges

In-charges reported that facilitation of health workers in terms of airtime to call on patients and their treatment observers will help in proper monitoring and follow-up. This will equip them with updated information on the patients.

The introduction of well facilitated community treatment supporters was mentions as one of the possible solutions to improve community-based TB DOT. They believe if this is worked on, even those patients without relatives will have a chance of getting a treatment observer.

CHAPTER FIVE

DISCUSSION

5.0 Introduction

This chapter presents the discussion of study finding according to the study objective; level of TB DOT implementation in Rubaga Division, patient factors affecting the implementation of TB DOT and health worker practices during the implementation of TB DOT.

5.1 Level of TB DOT implementation in Rubaga Division

The study revealed that majority, (66%) of the respondents was on TB DOT. This is almost consistent with the KCCA report of Rubaga division that indicated 69% of the TB patients are on community-based TB DOT (Program, 2014). The likely cause of the slight difference could be attributed to the fact that in this study we considered self reported views from patients while for the KCCA report are compiled from TB registers filled by health workers. However, these findings put Rubaga above the national average of 55%. Despite this achievements, the study reveals that adherence to TB DOT is still a challenge; more than half (53%) have take their medication without treatment observer calling for immediate action.

The study further revealed that out of the patients who reported to be on TB DOT, treatment observers are mainly relatives. This is consistent with results revealed by (Anongpone Prapanwonge, 2011), in their study about treatment observers, where majority of observers were family members. This was also highlighted by the in-charges in our study who stressed that the one leading challenge faced during the implementation of TB DOT is lack of treatment supporters in communities. Therefore, the only option the health facilities have is the use of relatives as treatment observers. However, using relatives greatly compromise the quality of

DOT due to their low commitment, respectability and high emotional ties with the patient which negatively affects TB DOT (Pungrassami et al., 2002). This was also noted by (Anongpone Prapanwong, 2011), in same study about treatment observers; that using family members as observers was associated with low treatment success rates. (Akhtar et al., 2011) in their cohort analysis of directly observed treatment outcomes for tuberculosis patients in urban Pakistan they indicated low cure rates among patients observed by family members than those supervised by the health facility.

This limitation was also demonstrated in the study findings where the researcher found out that more than half (53%) of the patients had taken their medication without treatment observers in a setting where majority of treatment observers are relatives. When asked why, majority of the patients reported that the treatment observers were away from home. Treatment observers being away at the time of taking medication was also indicated by (Khan et al., 2005) in their study to assess patient's adherence to TB DOT who revealed that despite the fact treatment observers were positive about TB DOT but still observation arrangements suited their programs not the patient so patients were supposed to look for the treatment observers. This in the end may affect patient's adherence to treatment.

5.2 Patient factors affecting the implementation of TB DOT

It was revealed that the age of the patient affected their being on TB DOT in this setting; the young were more likely to have their treatment observed by someone. This is consistent with (Bam et al., 2006) who revealed that the young ones were more likely to adhere to TB DOTs than the older patient. This could be attributed to the fact that young ones in most cases are still with their parents, not employed and abide with what the parents tell them which is different with old persons who are employed and take their own decisions. In this setting treatment

observers are likely to be relatives. Therefore, young children are likely to be on TB DOT because most of their time they are with their parents. This finding is further asserted by the reasons given by patients not on TB DOT where majority revealed that staying alone in their houses made them lack treatment observers.

The study also revealed that attitude of patients towards TB DOT affected their having a treatment observer. The likelihood of being on TB DOT increased with increasing positivity of the attitude. Patients with very good attitude were two times more likely to be on TB DOT than those with poor attitude. This is consistent with (Mweemba et al., 2008) who revealed the same finding in their study of patients' compliance to TB treatment. Patients with poor attitude towards TB DOT were more likely to be non-compliant to treatment than those with good attitude. Patient's attitude has also been indicated in a numbers of studies as a key factor affecting their adherence to TB treatment (Cramm et al., 2010). The poor attitude may be attributed to low knowledge and stigma patients have towards TB down in communities.

The study also revealed that being in union influenced the patient's being on TB DOT. Patients currently in union were 1.4 times more likely to be on TB DOT than those who were single. This is consistent with (Bam et al., 2006) in their study about adherence to TB DOT were they found out that being in union, patients were likely to adhere to TB DOT than the singles. In this setting a treatment observer is more likely to be relatives than community supporter. Singles in most cases do not have companions to support them in their treatment, therefore in such a setting they are likely to miss out the opportunity of observing their treatment. However, this findings are likely to be different in settings were TB DOT is mainly done by treatment supporters.

5.3 Health worker practices during the implementation of TB DOT

The study revealed that health workers mainly depend on the patient's availability of relatives or friends to help in the observation of TB treatment. This was stressed by in-charges who reported that without relatives or friends, patients are less likely to have a treatment supporter. Despite the fact that the WHO recommends that a treatment observer should be acceptable to the patient, over dependence on relatives or friends is likely to negatively affect the implementation of TB DOT as those patients without relatives or friends ready to be their treatment observers will end up with none. According to (Health, 2013), use of family members as treatment observers, is likely to compromise the adherence to treatment. However, over dependence on relatives in this setting is an indication of few community-based treatment observers as revealed by the study findings suggesting only 7% of those patients on DOT were supervised by a community-based treatment supporter.

The study also revealed that health workers rarely follow-up on treatment observers. Follow-up is only done to those patients who endeavor to come back for re-fills. According to the In-charges the main reason why this is not done was that most observers do not want to come to health facilities and even health workers do not have reliable ways to communicate to them. This is contrary to the guide lines that recommend a periodic follow-up on the patient and the treatment observers so as to monitor the progress of the patient and also to capture more information on the treatment which the patient may not tell the health workers. According to in-charges, the low motivation of health workers in TB clinic and the few available community treatment supporters are the leading causes for the low follow-up on the treatment observers. These findings are similar to those of (Khan et al., 2005) who revealed that patients and treatment supporters expressed concerns of transport cost and the need to keep up their

occupation as the leading reasons to why they would not come back to health facilities. This is likely to compromise on the adherence to the treatment and the procedures of how TB DOT is implemented thus creating a gap in the patients' treatment.

Although in-charges reported that all treatment observers are first educated through TB DOT, this was contrary to patients' views that indicated that 18% of the patients did not receive education about TB DOT. Low levels of knowledge of treatment observers affect the patients' adherence to Tb treatment. According to (Bam et al., 2006) in their study about adherence to TB DOT, non-adherent patients did not know that they were supposed to take medication daily. This relatively small proportion of patients lacking knowledge about TB DOT failure may be attributed to the low staffing in these clinics that on a particular day the few health workers available may not do all the necessary procedures as required. This was noted by in-charges as one of the reasons that compromise their performance in regard to proper implementation of TB DOT.

CHAPTER SIX

CONCLUSION AND RECOMMENDATION

5.0 Introduction

This chapter describes the conclusions drawn from the study findings and recommendations so as to improve TB DOT in Rubaga Division

5.1 Conclusion

Community-based TB DOT is being implemented in Rubaga although the most commonly used strategy is “relatives” as treatment observers and not community-based treatment supporters, an indication that there are few community-based treatment supporters.

Using relatives as treatment observers may not be a good strategy to improve treatment adherence as many patients took their medication without treatment supporters and those patients without relatives end up with no one to observe their treatment in this setting. Patient’s attitude, age and union status affect the patient’s being on TB DOT in this setting.

Health worker practices during the implementation of TB DOT are relatively below the required standard most especially in the education and follow-up of treatment observers and patients. Lack of community-based dedicated treatment supporters and the limited facilitation of health workers were the main barriers health workers face during the implementation of TB DOT in this setting.

5.2 Recommendation

There is need for vigorous introduction of community-based treatment supporters to supplement the family members as treatment observers.

Continuous health education on the importance of TB DOT is needed to change the attitude of patients so as to accept the DOT.

Improve the facilitation of health workers and also introduce a better communication strategy which does not affect the patient, treatment supporters and the health workers.

There is need to have a study to investigate the health system factors affecting the implementation of TB DOTs as a whole in detail.

Areas for further studies

There is need to investigate the perception of health workers towards TB DOT in an urban setting reading its applicability in such a setting.

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APPENDICES

Appendix 1: Consent form

My name is a student from International Health Sciences University (IHSU) collecting data to write my research project report titled “**implementation of community-based TB DOT in an urban setting: a case of Rubaga division, Kampala**” as a prerequisite to complete my studies of a bachelors degree in public health. I have been granted permission by my university administration, KCCA and the in-charge of this health centre to go no and collect this information.

You have been selected to participate in this study to give in your views so as to improve the service delivery in the area of TB treatment. However, your participation in this study is voluntary and you can withdraw or stop this interview at any time you feel you should. You are free to decline to answer any of those questions you think you are not read to give us your answer although if you answered all questions this would help in improving the delivery of TB services.

There are no direct benefits to you as an individual but the information provided will help improve services to all TB patients.

There is no risk you will face and all views you will be sharing with us will be kept confidential to only the research team.

Do you have any questions?

Yes No (if yes, answer all questions before the patient can sign the consent)

Signing or putting your thumb print on this document means you have been explained to and understood everything about this study and you have voluntarily accepted to participate

Participant signature/thumb print

interviewer signature

Appendix 2: Patient's questionnaire

Patient' questionnaire for an assessment of the implementation of CB-TB DOTS in Rubaga Division

An assessment of the implementation of TB DOTS in Rubaga Division

Qn	Description	Responses	Skips
Socio-Demographics			
Q1	Sex <i>Oli wakikula ki?</i>	Male1 Female.....2	
Q2	Age (complete yrs) <i>Olina emyaka emijjuvu emeka?</i>	_____	
Qn3	Are you in union? <i>Oli mufumbo?</i>	Single1 Married2 Divorced3 Cohabiting4 Widowed5	
Q4	What is your education level? <i>Okusomako kwenkana ki?</i>	None.....1 Primary2 Secondary3 Tertiary/university.....4	
Q5	How much do you earn in a month? <i>Mu mwezi ofuna sente meka?</i>	None.....1 <50000.....2 50,000-20,000.....3 200001-500,000.....4 500,001 and above.....5	
Community-based TB DOT implementation			
Q7	Do you have someone observing you when taking your TB medication? <i>Oyina omuntu yenna akulabirira kuby'okumira eddagala?</i>	Yes1 No.....2	If NO skip to q14
Q8	How many times has this person observed you taking TB medication in the past one two weeks? <i>Omuntu ono mirindi emeka gyabaddewo nga omira eddagala mu wiii ebbiri eziyise?</i>	_____ All the time.....999	
Q9	Was this person educated by health workers on how to support you during your TB treatment? <i>Omuntu on yasomesebwa abasawo ku ngeri gyanakulabirira mu kumira eddagala lyo?</i>	Yes1 No2	
Q10	How are you related to this person? <i>Omuntu on omuyita otya?</i>	Friend1 Relative2 TB treatment supporter.....3 Community member4	
Q11	Have you ever taken your medication without this person?	Yes1 No2	If No skip to q13

	Wali omizeeko eddagala lyo nga omuntu ono taliwo?		
Q12	If yes, what was the reason? (multiple choice) Oba ye, lwaki?	Away from home.....1 Told me to do so2 Supporter was far away.....3 Do not want the supporter.....4 Supporter was delaying me.....5 Other _____	
Q13	How far is this person from your home? Waliwo bangaki ofuvaw'obera n'omuntu ono?	Stay with me.....999	
Q14	Why don't you have someone to observe you taking your medication? Lwaki tolina muntu akulabirira mukumira eddagala lyo?	Don't stay with any person.....1 I was not given one.....2 I was not requested to come with one.....3	
Attitude			
Q17	There is no need for a treatment observer during my TB treatment. Tekyetagisa kuba n'omuntu akurabirira mukumira eddagala lyo.	Agree1 Disagree2 Do not know.....3	
Q18	No person will ever have time to be a treatment observer. Teli muntu ayina budde obwo nti alabirira mulwadde wa TB.	Agree1 Disagree2 Do not know.....3	
Q19	I like the idea of someone observing your TB treatment? Njagala ekirowoozo ky'okubera n'omuntu akulabirira mu kumira eddagala lya TB.	Yes1 No2	
Q20	Waiting for someone to observe your treatment is time consuming. Okulinda omuntu akulabe nga omira eddagala lya TB kimala obudde.	Agree1 Disagree2 Do not know.....3	
Stigma			
Q21	I do not want any other person to know that I have TB. Sagala muntu yena kumanya nti nina obulwadde bw'afuba	Agree1 Disagree2 Do not know.....3	
Q22	Treatment observers are likely to tell others about my TB status. Abalabirizi mukumira eddagala kyangu nnyo okugamba abantu abalala nti nina obulwadde bw'afuba.	Agree1 Disagree2 Do not know.....3	
Q23	People reject you when they find out that you have TB Abantu bakwesamba singa bakitegera nti oina obulwadde bw'afuba.	Agree1 Disagree2 Do not know.....3	

Health workers' Practice		
Q24	<p>Were you requested by health workers to bring a person who will observe your TB treatment?</p> <p><i>Abasawo bakusaba okuleta omuntu a nakulabirira mu kumiraeddagala lyo?</i></p>	<p>Yes1 No2</p>
Q25	<p>Did you receive information on the importance of someone observing your TB treatment?</p> <p><i>Wasomesebwa abasawo ku misago ejiri munkola y'omuntu akulabirira mukumira eddagala lyo?</i></p>	<p>Yes1 No2</p>
Q26	<p>Has any of the health workers requested you to come with someone observing your treatment on any of your visits?</p> <p><i>Abasowo bali ku gambyeko okuja n'omujanjabi wo?</i></p>	<p>Yes1 No2</p>

Appendix 3: Key informant interview guide for in-charge of TB clinics

An assessment of the implementation of CB-TB DOTS in Rubaga Division

Key informant interview guide for in-charge of TB clinics

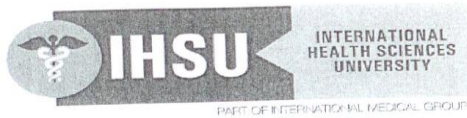
Qn1. What are your responsibilities as far as community-based TB DOT is concerned?

Qn2. How is community-based TB DOT implemented in this facility?

Qn3. What affects the implementation of community-based TB DOT in this facility?

Qn4. How can the implementation of community-based TB DOT in this facility be improved?

Appendix 4: Introduction Letter



Office of the Dean, Institute of Health Policy & Management

Kampala, 25th August 2014

DIRECTOR OF PUBLIC
HEALTH AND ENVIRONMENT
KCCA

Dear Sir/ Madam,

Re: Assistance for Research

Greetings from International Health Sciences University.

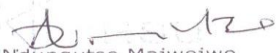
This is to introduce to you **Sempeera Hassard, Reg. No. 2011-BSCPH-PT-013** who is a student of our University. As part of the requirements for the award of a Bachelors Degree of Public Health of our University, the student is required to carry out field research for the submission of a Research Project.

Sempeera would like to carry out research on issues related to: **Implementation of Community Based TB Dot in an Urban Setting; A Case of Rubaga Division, Kampala**

I therefore request you to render the student such assistance as may be necessary for his research

I, and indeed the entire University are thanking you in anticipation for the assistance you will render to the student

Sincerely Yours,


Prof. David Ndungutse Majwejwe
Dean, Institute of Health Policy & Management

MAKING A DIFFERENCE IN HEALTH CARE

International Health Sciences University
P.O. Box 7782 Kampala | Uganda | East Africa
Tel: (+256) 0312 307 400 | E-mail: info@ihsu.ac.ug | web: www.ihsu.ac.ug

Appendix 5: Letter of Correspondence



DIRECTORATE PUBLIC HEALTH AND ENVIRONMENT

Ref: 600/KCCA/210/08

27th August 2014

Mr Sempeera Hassard,
International Health Sciences
University,
P O Box 7782,
Kampala

RE: PERMISSION TO CARRY OUT RESEARCH IN KAWAALA,
KITEBI AND KISENYI HEALTH CENTRE ON ISSUES RELATED
TO IMPLEMENTATION OF COMMUNITY-BASED TB DOT IN
AN URBAN SETTING: ACASE OF RUBAGA DIVISION KAMPALA

Reference is made to your letter dated 25th August, 2014 requesting for permission to conduct a study in KCCA health units.

This is to inform you that permission has been granted to you to collect data from Kisenyi, Kawaala and Kitebi Health Centers from August to September 2014

The above permission is granted to you on the following conditions:-

- 1) Participation in your research is voluntary and the informed consent process should be observed at all times.
- 2) Provision of a report to the office of the Director of Public Health and Environment, Kisenyi.

By copy of this letter, the In-Charges of the Health centers are requested to render you all the necessary support.


Dr. Okello Ayen Daniel
AG. DIRECTOR PUBLIC HEALTH AND ENVIRONMENT

c.c. In-charge Kawaala Health Centre
c.c. In-charge Kitebi Health Centre
c.c. In-charge Kisenyi Health Centre

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