

FACTORS CONTRIBUTING TO DELAY IN SEEKING TREATMENT
AMONG PULMONARY TUBERCULOSIS PATIENTS IN KIBWEZI
DISTRICT, KENYA

REDEMPTA K. MUTISYA B.Ed. (Science)

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Declaration

This thesis is my original work and has not been presented for a degree or any other award in any other university.

Signature

Date

Redempta K. Mutisya, B.Ed (Science)

I57/CE/10518/04

Supervisors' Approval: This thesis has been submitted for examination with our approval as university supervisors.

1. Signature

Date

Dr. Magaret Keraka, PhD., Senior Lecturer,
Department of Public Health, Kenyatta University

2. Signature

Date

Dr. John. J. N. Mbithi, PhD., Senior Lecturer,
Department of Medical Laboratory Science, Kenyatta University

Dedication

To my dear parents from whom I learnt the virtues of hard work and perseverance. To
Pat my husband and Denyi our daughter.

Acknowledgement

I would like to express my profound gratitude to my supervisors Dr Margaret Keraka and Dr John J N Mbithi for their invaluable advice and support. This research would not have been possible without their contribution and encouragement.

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Abstract

Tuberculosis (TB) is a major global public health problem. The disease is a leading cause of morbidity and mortality in Kenya. TB control has remained a major challenge for the National Leprosy and TB Control Programme (NLTP) especially in this HIV/AIDS era and the emergence of multi-drug resistant TB (MDR-TB). Early identification of cases and commencement of effective chemotherapy is an effective method to control the spread of TB. Reliance by NLTP on passive case finding means that patients play a key role in reducing delay to diagnosis and treatment commencement. Patient delay (duration from onset of symptoms to first contact with a health care provider at a public health facility) is a major challenge to TB control and is dependent on several factors which may have an influence on each other. The purpose of this study was to determine the duration from onset of symptoms to seeking appropriate TB treatment among pulmonary TB (PTB) patients and factors associated with patient delay in the high HIV prevalence Kibwezi District in Kenya. A cross sectional survey of 133 PTB patients was carried out at five public health facilities over a period of 8 weeks. Data collected using a semi-structured questionnaire were entered and analyzed using Epi - Info version 3.4. The mean patient delay and associations between length of patient delay and the various independent variables was determined. Multiple logistic regression was performed to determine the factors independently associated with patient delay. The mean patient delay was 54 days (1.8 months) and 65.4% of the study subjects had delayed for more than 30 days. Private clinics were more preferred (45%) to public health facilities (21%) Delay in seeking the appropriate TB treatment among PTB patients in Kibwezi District was associated with poor perception of services in public health facilities (OR = 4.91; CI: 1.6-15.3; p = 0.0061), visiting a private clinic (OR = 4.24; CI: 1.5-11.6; p = 0.0052) and stigma (OR = 2.46; CI: 1.9-12.2; p = 0.0178). Most PTB patients in Kibwezi District present at public health facilities 30 days after the onset of major TB symptoms. Long delay was associated with having a poor perception of the quality of services in public health facilities, prior attendance at a private clinic and stigma. Delay was not found to be associated with the patients' socio-demographic characteristics, knowledge of TB, distance or transport cost to public health facility and perception of TB disease. Neither having a good TB knowledge score nor perceiving TB as a serious disease translated to early care seeking at a public health facility. The findings of this study underscore the need by the Division of Leprosy TB and Lung Disease (DLTLD) to integrate private clinics into the public sector TB control program. The DLTLD supervisory staff can be increased to ensure adherence to standards. Since TB services are integrated in the general health care system, the findings also highlight the need by the Ministry of Public Health and Sanitation (MoPH&S) to improve service delivery in public health facilities so as to correct the poor perception and reduce patient delays. Staff in public health facilities can be trained in communication skills. Educational campaigns should go beyond providing general information about TB to emphasize embracing a positive attitude to prevention of transmission through early treatment.

Acronyms

AIDS	-	Acquired Immune Deficiency Syndrome
CNR	-	Case Notification Rate
DOTS	-	Directly Observed Therapy Short Course
DLTLD	-	Division of Leprosy Tuberculosis and Lung Disease
DTLC	-	District TB and Leprosy Coordinator
EPTB	-	Extra Pulmonary Tuberculosis
HIV	-	Human Immune Deficiency Virus
HSB	-	Health Seeking Behavior
MDRTB	-	Multi- Drug Resistance TB
MoH	-	Ministry of Health
MoPH&S	-	Ministry of Public Health and Sanitation
NLTP	-	National Leprosy and TB Programme
PLWAS	-	People Living With AIDS
PTLC	-	Provincial TB and Leprosy Coordinator
PTB	-	Pulmonary Tuberculosis
TB	-	Tuberculosis
WHO	-	World Health Organization

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CHAPTER I**INTRODUCTION****1.1 Background**

Tuberculosis is an infectious bacterial disease caused by *Mycobacterium tuberculosis* which commonly affects the lungs (WHO, 2007). The disease which is a major global public health problem was declared a global emergency by the World Health Organization (WHO) in 1993. In Africa the WHO Regional Committee for Africa declared the disease an emergency 2005 (WHO, 2005).

The disease is transmitted from an infected person to another through aerosolized droplets which makes coughing the most important mode of transmission (MoH, 2006). The risk of exposure to the bacillus is related to the incidence of infectious TB in the community, the number of cases that a person interacts with over time and the duration of infectiousness of the cases (MoH, 2006). The risk of infection is higher if a person spends long hours with an infectious person who is not on treatment especially if the contact occurs in poorly light and poorly ventilated environments (MoH, 2006). In most cases, the body is able to contain the infection thus majority of individuals do not develop TB disease (WHO, 2007). However in the old and very young children (especially those under one year), the poorly nourished and individuals with poor immune defenses (such as persons infected with HIV), the risk of developing TB disease following an infection is high (MoH, 2006).

The WHO estimates that 9.27 million new cases of TB occurred in 2007 (139 per 100 000 population) globally, compared to 9.24 million cases in 2006. Forty four percent (44%) of the 9.27 million new cases were new smear positive TB cases (WHO, 2009). The rapid global increase in TB incidence has been linked to HIV/AIDS, weak health systems and poverty (WHO, 2005).

Africa accounts for about 2.4 million cases of TB and 540 000 TB deaths occur each year in the continent (WHO, 2005). The continent contributes 31% of all the global TB cases (WHO, 2009). According to WHO (2001), Sub-Saharan Africa has been contributing up to 40% of all the TB cases notified in Africa (WHO, 2001).

Kenya is one of the 22 high TB burdened countries in the world (MoH, 2006). The number of TB cases reported in the country increased ten fold from 11,625 in 1990 to 116,723 in 2006 (MoPH&S, 2007). The incidence of all forms of TB in Kenya (353 new cases per 100 000 population per year) is higher compared to that of Tanzania (297 new cases per 100 000 population per year) and Uganda (330 new cases per 100 000 population per year) (WHO, 2009).

Case finding is an important component in TB control (Auer *et al.*, 2000). In 2005, the National Leprosy and TB Control Program (NLTP) in Kenya introduced the community/household cough monitors in an effort to identify more cases of TB. But case finding in Kenya continues to be largely passive (MoH, 2006). In passive case finding, only those TB patients who present themselves at the health facilities are screened and diagnosed for TB (Auer *et al.*, 2000).

The TB patients' effort to seek health care is therefore of importance for early identification of cases and the consequent reduction in the length of patient delay. Reducing the delay in seeking the appropriate TB treatment remains a challenge for the NLTP in Kenya (MoPH&S, 2007).

The Ministry of Health (MoH) estimates that only 50% of the TB cases are detected in Kenya indicating that the remaining 50% continue to transmit the disease (MoH, 2006). The HIV prevalence in Kibwezi District stands at 5.3% due to the rampant commercial sex trade along the Nairobi – Mombasa highway. And since TB and HIV closely associated and stigmatized, this may have an influence on the health seeking behavior of TB patients (Ngamvithayapong *et al.*, 2001). Studies have revealed that TB patients resort to self medication using traditional medicine (Liefoghe *et al.*, 1997; Godfrey- Faussett *et al.*, 2002), others buy drugs from shops, drug vendors and pharmacies (Hoa *et al.*, 2003; Yimer *et al.*, 2005), while others seek treatment from private clinics which may result to delay in getting the appropriate treatment. Patient delay (Cambanis *et al.*, 2005; Demissie *et al.*, 2002) is a major contributor of the total delay (Odusanya *et al.*, 2004; Demissie *et al.*, 2002).

Although the Ministry of Health (MoH) and that Public Health and Sanitation (MoPH&S) have made tremendous progress in the fight against TB, scanty information on the extent and factors influencing patient delay in rural areas like Kibwezi District pose a challenge to TB control efforts.

1.2 Problem Statement

TB is a major global public health problem and a leading cause of morbidity and mortality in Kenya. Control of the disease in this HIV era has been exacerbated by the emergence of MDR-TB (MoH, 2006). Early case finding, initiation of effective chemotherapy and case holding are cornerstones in TB control. However where TB case finding is largely passive as is the case in Kenya, the patient plays an important role in reducing delay to diagnosis. Delay in seeking appropriate TB treatment is a challenge in TB control (MoPH&S, 2007).

The MoH estimates that about 50% of TB cases in Kenya remain undiagnosed in the population (MoH, 2006). These cases contribute to increase transmission, mortality and morbidity and the effects are severe in TB patients co-infected with HIV. The burden of undiagnosed TB may be attributable to patients' late presentation (Pronynk *et al.*, 2001; Yimer *et al.*, 2005). In spite of its importance in case finding, quantitative information on the extent and factors influencing patient delay in seeking appropriate TB treatment particularly in high HIV prevalence rural settings in Kenya is inadequate.

1.3 Justification

Kibwezi District is in Eastern Province which reported the third highest number (15,766) of TB cases in Kenya in the year 2007. Makueni District from where Kibwezi District was carved reported 2,333 cases of TB (MoH, 2007; NLTP, 2005). The district lies along the Mombasa - Nairobi - Busia transit corridor and commercial sex trade is rampant in all the towns along the highway.

This has contributed to the high HIV prevalence (5.3%) and consequent increase in TB cases in the area. An understanding of the factors which contribute to patient delay in this district can inform strategies aimed at improving case finding.

1.4 General Objective

The general objective was to determine the extent and the factors associated with patient delay in seeking appropriate TB treatment in Kibwezi District in Kenya.

1.5 Specific Objectives

The specific objectives were;

1. To determine the socio-demographic characteristics of PTB patients in Kibwezi District;
2. To determine the duration from onset of major symptoms to time of seeking appropriate TB treatment in PTB patients;
3. To determine the proportion of patients who delay for more than 30 days before seeking the appropriate TB treatment in Kibwezi District;
4. To identify the factors associated with patient delay in seeking appropriate TB treatment in PTB patients in Kibwezi District.

1.6 Research Questions

1. What are the socio-demographic characteristics of the PTB patients in Kibwezi District?
2. What is the duration from onset of major symptoms to time of seeking the appropriate TB treatment in PTB patients?

3. What proportion of PTB patients delay for more than 30 days before seeking the appropriate TB treatment in Kibwezi District?
4. What factors are associated with patient delay in seeking appropriate TB treatment in PTB patients in Kibwezi District?

1.7 Hypothesis

1. The mean and median duration of patient delay among PTB patients in Kibwezi District is ≤ 30 days.
2. There are no factors associated with patient delay in seeking the appropriate TB treatment in Kibwezi District.

1.8 Significance of Study

A good understanding of the predictors of patient delay is important in TB control. Information from this study will be useful to the Ministry of Public Health and Sanitation (MoPH/S) particularly DLTLD in developing interventions aimed at improving early identification of pulmonary TB cases so as to initiate effective chemotherapy and check disease transmission in the population. When PTB cases are identified early and effective treatment is started, the burden of morbidity is greatly lessened in the patient. Mortality due to TB is reduced while the chance of treatment success improves.

1.9 Limitations of Study

A selection bias had been introduced in this study because the sample did not include PTB patients who did not seek treatment at the five public health facilities during the 8 weeks of survey. The findings of this study should therefore be interpreted with caution. The length of patient delay was self reported and thus prone to recall bias. To minimize this bias, only newly diagnosed patients and those in their first two months of TB treatment were included in the survey. The patients were specifically asked about the onset of major symptoms and local calendars and national holidays were used to help patients recall with a degree of accuracy.

1.10 Delimitations of the Study

A sample size of 133 PTB patients aged 15 years and above was identified from five health facilities in Kibwezi District namely; Makindu District Hospital, Kibwezi, Mtitto Andei, Ngwata and Sultan Hamud Health Centres. Four of these facilities have equipment for conducting sputum microscopy which is one of the key methods of diagnosing TB recommended by WHO.

1.11 Assumption

Data was collected over a period of 8 weeks during the months of February and March 2008. It was assumed that the patients included in the survey would not be significantly different from patients seeking TB treatment during any other months of the year.

1.12 Conceptual Framework

The duration from onset of TB symptoms to initiation of effective TB chemotherapy is generally referred to as total delay. This delay is divided in to;

- a) delay due to patient related factors (patient delay)
- b) delay due to health system related factors (health systems delay). Health system delay comprises of diagnostic and treatment delay.

In depth literature search and consultation with NLTP staff established that TB patients may delay in seeking appropriate TB treatment promptly due to factors related to access to health care services, socio-economic and demographic factors, awareness of TB symptoms, stigma and perceptions of disease and health care services. This study conceptualized that patient delay in seeking appropriate TB treatment to be due to factors such as; stigma attached to TB disease owing to its close association with HIV/AIDS, the patients' socio-demographic characteristics, the patient's knowledge of cause, mode of transmission and symptoms of TB disease, health seeking behavior, perception of quality of services in public health facilities and the perceptions on the curability and seriousness of TB disease. There may be interactions between the various factors to result to the varying lengths of patient delay. Figure 1 demonstrates the conceptual framework for the study.

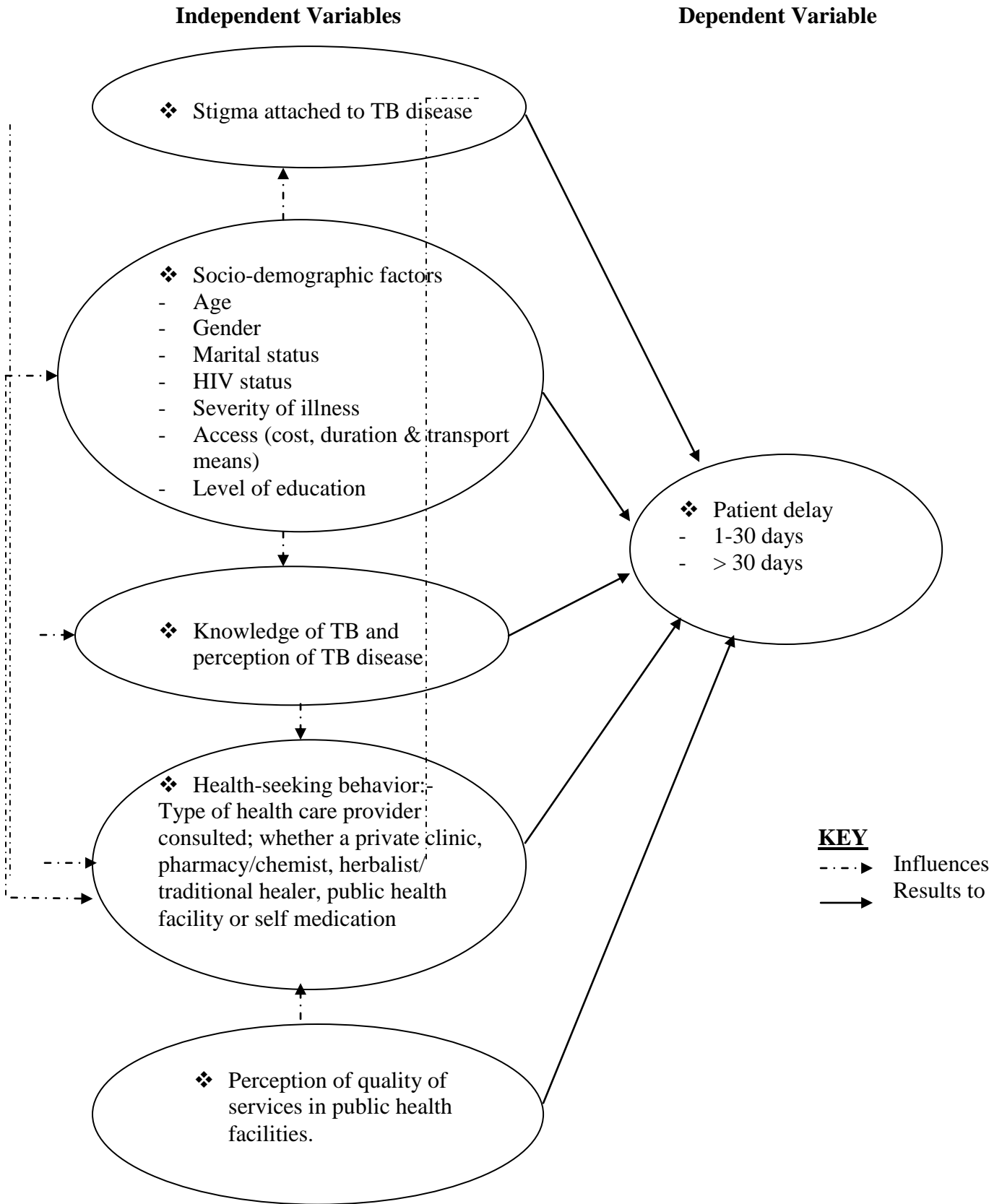


Figure 1 Conceptual Framework

1.13 Operational Definitions

Accessibility - This is the ease with which PTB patients obtain TB care from public health facilities. It was measured in terms of the duration (in hours) in takes from their homes to the nearest public health facility, cost (in Ksh) and mode of transport used.

Appropriate TB treatment - The Directly Observed Therapy Short Course recommended by the WHO and which involves use of multiple drugs in combination. The drugs are; Rifampicin (R), Isoniazid (H), Pyrazinamide (Z) and Ethambutol (E). The DOTS is used in the treatment of TB in Kenya.

Extra-pulmonary TB (EPTB) - TB occurring outside the lungs.

First health care provider - This is any facility or individual visited by the patient for the diagnosis and treatment of their TB.

Gender - The social difference between male and female. It was obtained as categorical data from the patients during the interview.

Government/public health facility - Health facilities under the Ministry of Health (MoH).

Health seeking behavior (HSB) - What people do, individually or collectively to maintain and/or return to health.

In this study the HSB was analyzed in terms of where the patient sought health care first and who influenced their decision to seek appropriate TB treatment.

Knowledge of TB - A measure of how much the PTB patients know on the cause, infectiousness, mode of transmission, symptoms , exact relationship between TB and HIV and treatment of TB.

Multi drug resistance - Resistance of TB bacilli to Rifampicin and Isoniazid.

Patient delay - The duration from on set of TB symptoms to the first visit to a public health facility.

Passive case finding - When healthcare workers rely on the self presentation at the health facilities by persons with symptoms indicative of TB disease.

Perception of TB disease - It is the study subjects' view of TB disease.

Perception of the quality of services in Public health facilities - These are the views of the study subjects concerning the quality of services in public health facilities.

Pulmonary Tuberculosis - TB occurring in the lungs.

Re-treatment cases - Patients being treated for TB for a second or more times because of defaulting, relapse of TB or failure of the previous treatment.

Severity of illness - This was a measure of the degree of illness. A simple scale was used to establish the degree of illness at the time of presentation to government/public health facility.

Stigma - It is a deep rooted belief in the mind and which is related to contextual factors existing in the society towards any particular human behavior.

TB - Tuberculosis is an infectious disease caused by a bacillus called *Mycobacterium tuberculosis*, an acid fast rod shaped bacillus. The most frequent form of TB disease occurs in the lungs and is known as pulmonary TB (PTB). PTB is the most important form of TB from the public health point of view because only this type can be transmitted from person to person.

TB symptoms - The following symptoms were considered as TB symptoms:

Cough of longer than 2 weeks, fever and night sweat, loss of weight, chest pain, shortness of breath, coughing sputum which is blood stained (haemoptysis). Any one of these symptoms was considered when estimating the length of patient delay.

CHAPTER II

LITERATURE REVIEW

2.1 TB/HIV Burden

Although poverty, population growth and HIV/AIDS are major factors contributing to the continued increase in TB incidence in the world today, the many undiagnosed cases of TB pose a significant problem in TB control efforts (WHO, 2003).

An estimated 38 million people are living with HIV worldwide while another 16 million progress to active TB disease and 2 million die every year of TB. About 11 million people are co-infected with TB and HIV (NLTP, 2003; Gerardo de Cosio, 2005). The WHO estimates that 9.27 million new cases of TB occurred in 2007 (139 per 100 000 population) globally, compared to 9.24 million cases in 2006. Forty four percent (44%) of the 9.27 million new cases were new smear positive TB cases (WHO, 2009). The rapid global increase in TB incidence has been linked to HIV/AIDS, weak health systems and poverty (WHO, 2005).

Africa has only 11% of the world's population yet it accounts for about 2.4 million cases of TB and 31% of all the global TB cases. Over 500 000 deaths occur in Africa each year from TB disease (WHO, 2009; WHO, 2005). The dramatic rise in TB rates in many countries is driven by HIV and Sub-Saharan Africa continues to bear the brunt of HIV fuelled TB (Godfrey - Faussett *et al.*, 2002). The region (with approximately 23% of the continent's population) accounts for about 40% of annually notified TB cases in Africa and has some of the highest TB notification rates (700 per 100 000 population) in the world (WHO, 2001).

Eighty percent (80%) of the 9.27 million new TB cases diagnosed globally occur in the 22 high TB burdened countries, which include Kenya (NLTP, 2003; Gerardo de Cosio, 2005). The number of TB cases reported in Kenya has risen ten fold from 11,625 in 1990 to 116,723 in 2006 while case notification rate stands at 111/100 000 population for smear positive TB (MoPH&S, 2006). The HIV prevalence in the country stands at 6.7% and there are cumulatively more HIV infected people in rural areas compared to urban areas (MoH, 2005). TB prevalence in Kenya is estimated to be 30% and the HIV prevalence among TB patients in 2007 was 48% (MoPH&S, 2007). Tuberculosis remains a leading cause of death among people living with AIDS, (PLWA) (MoH, 2005).

Eastern Province reported 15,766 TB cases in 2007, the third highest in the country. Makueni District reported 2,333 TB cases in 2005 and over 700 of these were in Southern Makueni District, currently Kibwezi District (MoH, 2007; NLPT, 2005).

2.2 Patient Delay

Early case finding and treatment compliance are cornerstones in TB control (Liefoghe *et al.*, 1997). But Prompt diagnosis and initiation of effective treatment is uncommon (Jaramillo, 1998). Greater proportion of the total delay (time between onset of symptoms and initiation of effective treatment) is due to patients' late presentation (Pronyk *et al.*, 2001; Demissie *et al.*, 2002). According to Yimer *et al.*, (2005) the burden of undiagnosed TB could be due to the patients' delay in seeking appropriate health care.

Delay in seeking appropriate treatment makes the disease more severe, increases transmission, (Godfrey – Faussett *et al.*, 2002; Demissie *et al.*, 2002), increases the risk of death (Lienhardt *et al.*, 2001), and may result to the development of drug resistance (Auer *et al.*, 2000). These risks are more severe for those co infected with HIV (Lawn *et al.*, 1997).

2.3 Factors Influencing Patient Delay

Patient related delays have been found to be influenced by various factors. These include socio-demographic factors (age, gender, level of education, physical access to health facilities, degree of illness, ethnicity and economic status), Health Seeking Behavior (HSB), perception of TB disease and knowledge of symptoms and stigma attached to TB disease among others.

2.3.1 Socio-Demographic Factors

A study in Thailand found patient delay to be longer in patients who had to borrow money for a hospital visit (Ngamvithayapong *et al.*, 2001) a finding similar to another in Ethiopia where rural residence was associated with delay of over 4 weeks due to the high costs of transportation required by patients to travel to the health centre (Cambanis *et al.*, 2005). The same study linked rural poverty to patient delay which contrasts findings in Zambia (Godfrey – Faussett *et al.*, 2002) that there is no association between patient delay and socioeconomic status.

Old age was associated with patient delay (Yimer *et al.*, 2005), probably because older people are more likely to visit traditional healers, pharmacies and drug stores

(Kasse *et al.*, 2006) and private clinics (Godfrey- Faussett *et al.*, 2002). Older people also rely on other persons which makes it difficult for them to visit health facilities at the preferred time (Yimer *et al.*, 2005).

Although greater delays have been reported in women by some studies, gender was not associated with patient delay in Zambia (Godfrey – Faussett *et al.*, 2002).

The association of patient delay of over 4 weeks and rural residence (Cambanis *et al.*, 2005) underscores the importance of physical access to health care services.

In another study (Hooi, 1994) longer delay was reported in people with less education, a contrast to the lack of association between patient delay and education levels in similar study carried out in Zambia (Godfrey – Faussett *et al.*, 2002).

Severely ill patients (bed ridden or house- bound) delay in seeking treatment for cough probably because carrying them to the health facility can be expensive or undignified (Godfrey – Faussett *et al.*, 2002).

2.3.2 Knowledge of TB, Perceptions and Health Seeking Behavior (HSB)

The National Leprosy and TB Program relies on passive case finding to identify a TB case which means that the health workers wait for people with symptoms indicative of TB to present themselves at the health facilities (NLTP, 2003). This method of identifying TB cases depends on when people decide to present themselves at the health facilities for help (Cambanis *et al.*, 2005), and makes the HSB an important factor in the early identification of TB cases.

Studies show that individuals with symptoms indicative of TB consult private clinics (Godfrey-Faussett *et al.*, 2002), take home-made remedies, buy drugs from pharmacies or shops, visit folk healers (Jaramillo, 1998; Kasse *et al.*, 2006), or even result to self medication using herbs (Liefoghe *et al.*, 1997) as first health care action. However private clinics, traditional healers, herbalists and pharmacies are less qualified to offer TB treatment (Hoa *et al.*, 2003). This may be the reason why some studies found patient delay to be associated with visiting private clinics (Godfrey–Faussett *et al* 2002), traditional health sector (Liefoghe *et al.*, 1997; Cambanis *et al.*, 2005), pharmacies, drug stores and open market drug sellers (Yimer *et al.*, 2005).

Traditional healers are consulted because the community accepts them as alternative providers of health care. Their TB treatment is less cumbersome and payment for services can be made after the patient recovers (Liefoghe *et al.*, 1997).

Visiting traditional healers occurs frequently because most communities have their local explanatory models (which may differ from the biomedical ones) and these define the type of care sought (Liefoghe *et al.*, 1997).

Decisions to seek health care are based on indigenous concepts of particular illnesses and appropriate remedies (Cambanis *et al.*, 2005) thus a community's beliefs concerning the cause of a disease is an important determinant of the HSB (Liefoghe *et al.*, 1997). Perceiving TB as a folk illness or a curse may lead to failure to seek medical treatment.

Similarly the perception of TB disease as highly contagious, difficult to diagnose and treat and as a disease which should be treated in a hospital by a doctor may make patients shun seeking treatment from health centres and dispensaries (Liefoghe *et al.*, 1997).

Studies in Kenya (Liefoghe *et al.*, 1997) and Uganda (Kiwuwa *et al.*, 2005) revealed that patient delays among TB patients who were smokers were caused by the perception that prolonged cough was caused by smoking. Persistent cough was not found to be a cause of worry (Liefoghe *et al.*, 1997) unless it is accompanied by other severe symptoms (Hoa *et al.*, 2003; Cambanis *et al.*, 2005; Demissie *et al.*, 2002; Liefoghe *et al.*, 1997).

Studies found that initial cough symptoms of TB may be misinterpreted as flu or common cold (Jaramillo, 1998; Liefoghe *et al.*, 1997) while the fever is seen as a sign of Malaria (Liefoghe *et al.*, 1997). This can cause delays because individuals result to self treatment or get wrong prescriptions. While some studies have linked the lack of TB knowledge and patient delay and/ or consultation of less qualified health providers (Hoa *et al.*, 2003), others (Godfrey–Faussett *et al.*, 2002) did not. ‘Shopping’ for health care was however found to result to delays in diagnosis (Auer *et al.*, 2000).

2.3.3 Perception of the Quality of Health Services

Among the factors that influence whether or not patients seek treatment and with the appropriate providers is the perception of the quality of health services (Tipping *et al.*, 1997). Poor quality of health care services was found to be an important barrier to early diagnosis (Jaramillo, 1998).

Patient delays were associated with poor perception of health services in Zambia (Godfrey-Faussett *et al.*, 2002) where role plays by TB patients depicted health staff as rude to the patients. The finding is similar to that of another study done in Colombia (Jaramillo, 1998), where impolite health care personnel were an important reason for consulting private doctors who were more likely to give a diagnosis on the spot. But often diagnosis and management of TB is inadequate in private clinics (Godfrey-Faussett *et al.*, 2002).

A study in Kenya (Liefoghe *et al.*, 1997) found that the community felt that peripheral health facilities (health centres and dispensaries) were ill equipped and lacked the personnel to diagnose TB satisfactorily. Following the decentralization of TB services and the aggressive efforts by the NLTP to increase the number of facilities offering smear microscopy services (MoH, 2006) it is important to determine whether this feeling may have changed and whether it influences the HSB and patient delay.

2.3.4 Stigma

Tuberculosis patients are stigmatized by the community and family members may be because of the close association between TB and HIV/AIDS (Godfrey-Faussett *et al.*, 2002) and this may alter the HSB of TB patients (Ngamvithayapong *et al.*, 2000). Stigma attached to TB may also be due to doubts about its curability or its contagious nature (Liefoghe *et al.*, 1997). Even family members were found to become afraid of sharing rooms, utensils, beddings, food and in some cases talking to the patient (Liefoghe *et al.*, 1997).

Such experiences make the patients feel ostracized because of their TB. A study in Colombia (Jaramillo, 1998), identified stigma attached to TB disease was identified as a barrier to early diagnosis. Patients who felt ostracized because of their TB delayed in seeking treatment.

In Kenya Liefoghe *et al.* (1997) linked patient delay to the social stigma attached to TB disease. Fear of being diagnosed with TB (a positive diagnosis leads to isolation) makes individuals to result to self medication. The perception of TB as a 'dirty' incurable disease negatively affects the HSB in undiagnosed patients (Hoa *et al.*, 2003). But in spite of the stigma attached to TB some studies found no association between stigma and patient delay (Godfrey- Faussett *et al.*, 2002), while Ngamvithayapong *et al.* (2001) found patient delays to be shorter among HIV positive TB patients.

CHAPTER III

METHODOLOGY

3.1 Study Design

A cross sectional survey was conducted in which questionnaires were administered to PTB patients seeking treatment from the Makindu District Hospital, Kibwezi, Mtitto Andei, Ngwata and Sultan Hamud Health Centres in Kibwezi District during the 8 week period of survey.

3.2 Study Variables

The study variables were:

a) Dependent Variable

The dependent variable was patient delay. It was measured in terms of number of days. In the absence of a scientifically agreed on criteria for defining patient delay, an extensive literature search on related researches, MoH and NLTP publications and consultations with DTLCs was done. A period of 30 days was taken as the ‘maximum acceptable’ patient delay. Patient delay was dichotomized in to lesser and longer delay using 30 days as the cut-off point. Therefore in this study,

- patient delay of 30 days or less = Lesser delay;
- patient delay of more than 30 days = Longer delay.

b) Independent Variables

i) Socio-demographic characteristics: These included age, gender, marital status, HIV status, duration, cost and means of transport to the public facility, level of education and the severity of illness.

A simple scale was used to establish the severity/degree of illness at the time of presentation to government/public health facility:

- Patient could still do a full days work meant that he/she was not hampered by the TB;
- Patient could only do light chores outside the house meant that the patient was moderately ill;
- Patient was housebound/bedridden meant that the patient was severely ill.

ii) Choice of first health care provider - The study subjects were asked where they sought treatment first for their TB.

iii) Knowledge of TB - Knowledge was measured using a scoring method adapted from Karki (2004). Seven questions were asked. A score of 1 was awarded for each correct response while an incorrect response was awarded a score of 0. A summary indicator for knowledge was calculated as follows:

- ≥ 3 correct responses ($> 50\%$) = Poor knowledge;
- 4- 5 correct responses (50% - 79%) = Average knowledge;
- 6 - 7 correct responses ($\leq 80\%$ - 100%) = Good knowledge.

iv) Perception of TB disease - This was established by asking the study subjects questions related to the seriousness TB disease and whether TB is curable.

v) Stigma - Eight statements which sought establish the existence (or non existence) of fear of isolation by family and community and fear of having HIV were used.

The patients' responses were 'yes' or 'no'. An answer which implied stigma was awarded 1 and 0 was awarded for response which did not imply stigma (Karki, 2004).

A summary indicator for stigma was obtained as follows:

- ≥ 2 ($> 30\%$) = Low level of stigma;
- 3 - 4 (30% -59%) = Average level of stigma;
- 5 - 8 ($\leq 60\%$ - 100%) = High level of stigma.

vi) Perception of quality of services in government/public health facilities - This was measured by asking the study subjects how they felt about the competence of the health staff, waiting time, sensitivity of staff to patient, corruption and drugs availability. A response which implied a negative perception was awarded -1, neutral response was awarded 0 and a statement which implied a positive perception was awarded +1 (Karki, 2004). A summary indicator for the perception of the quality of service was obtained as follows:

- 0 - 3 Positive ($> 50\%$) = Poor perception;
- 4 - 5 Positive (50% – 70%) = Average perception;
- 6 -7 Positive ($\geq 80\%$ - 100%) = Good perception.

3.3 Study Area

The study was carried out in Kibwezi District which lies approximately 197 kilometers east of Nairobi. The district has four divisions and over 450,180 inhabitants. Kibwezi District is in the Eastern Province of Kenya and was recently carved out from Makueni district. The district experiences droughts and famine with the most recent one lasting 4 years (from 2002-2006).

Majority of the population are poor and depend on rain-fed subsistence agriculture. A good number of men work outside the study area, some in cities and major towns leaving behind their wives and children. The area lies along the Mombasa - Nairobi - Busia transit corridor and commercial sex trade is rampant in all the towns along the highway. This has contributed to the high HIV prevalence and consequent increase in TB cases in the area.

The district is served by one district hospital at Makindu, six health centres, one sub-health centre and thirteen dispensaries. This number of health facilities is far much less than the demand for health care facilities in this region. Only four out of these health facilities are both diagnostic and treatment centres of TB. Tuberculosis diagnosis and treatment is free in all public health facilities under the Ministry of Health (MoH) but often patients have to commute over long distances to the health facilities using mainly bicycles or sometimes vehicles. There are a good number of private clinics run by personnel without any formal training in TB. Private clinics do not have the anti-TB drugs recommended by the Ministry of Health.

The area lacks electricity (except in towns along the highway) and adequate clean water supply. This study area was identified for its typical rural setting characteristic high HIV/AIDS prevalence.

3.4 Target Population

The study targeted PTB patients aged 15 years and above in high HIV prevalence rural areas in Kenya such as Kibwezi District.

3.5 Study Population

The study population consisted of newly diagnosed PTB patients and PTB patients in the intensive phase of TB treatment aged ≥ 15 years who sought treatment from the five public health facilities in Kibwezi District during the 8 week period of survey.

3.6 Inclusion and Exclusion Criteria

Inclusion Criteria

This study included:

- a) All the newly diagnosed PTB patients and PTB patients in the intensive phase of TB treatment who sought treatment at the Makindu District Hospital, Kibwezi, Mtitto Andei, Ngwata and Sultan Hamud Health Centres in Kibwezi District.
- b) PTB patients aged 15 years and above;
- c) PTB patients who met inclusion criteria (a) and (b) and consented to participate in the study.

Exclusion criteria

- a) Re-treatment and EPTB were excluded because of the possibility of not being able to remember with a fair degree of accuracy the length of delay before they sought the first treatment;
- b) PTB patients who had been on TB treatment for a period of over 2 months;
- c) PTB patients who declined to participate in the study;
- d) PTB patients aged below 15 years.

3.7 Sampling Techniques and Sample Size

3.7.1 Sampling Techniques

Purposive sampling was used to identify five government/public health facilities in Kibwezi District namely; Makindu District Hospital, Kibwezi, Mtitto Andei, Ngwata and Sultan Hamud Health Centres. These were selected as study sites because they reported high TB case loads in 2005 and also because all except Ngwata had sputum microscopy equipment. Since sputum microscopy is the method of TB diagnosis used by the Ministry of Health, purposively identifying these facilities made it possible to capture newly diagnosed PTB patients thus minimizing recall bias. The inclusion of Makindu District Hospital served to ensure that the sample was more representative since the hospital serves patients from the entire Kibwezi District.

The patient sample in each health facility was a convenience sample. Consecutive patients who gave an informed verbal consent to participate were interviewed by the researcher and a trained research assistant.

3.7.2 Sample Size Determination

The sample size of 128 was calculated using the formula by Fisher *et al* (1988) for determining the sample size when the population is less than 10,000. The confidence interval was set at 95% and a margin error of 5%. Previous related studies in Ethiopia (Yimer *et al.*, 2005; Demissie *et al.*, 2002) showed 58% and 50% respectively as the proportion of TB patients who delay for more than one month before seeking treatment. It was assumed that 50% of TB patients in Kibwezi District delay for more than one month.

The study used 30 days as the cut-off point to dichotomize the patient sample into those with lesser and longer delay.

‘N’ was the estimate population of PTB patients in the intensive phase of TB treatment aged 15 years and above in Kibwezi District. In the last quarter of 2007, ‘N’ was 128 PTB patients. The sample size was computed as follows;

$$nf = \frac{n}{(1 + n)/ N}$$

Where

nf = desired sample size (when the target population is less than 10 000).

n = desired sample size (when the target population is more than 10,000)

N = the estimate of the population size and

$$n = \frac{Z^2 pq}{d^2}$$

Z = the standard normal deviate at the required confidence level (1.96)

P = Proportion in the target population estimated to have the characteristics being measured (proportion of TB patients who delay for more than one month is assumed to be 50%)

q = 1-p

d = Level of statistical significance set (0.05)

$$\begin{aligned} n &= \frac{(1.96)^2 (0.5) (0.5)}{(0.05)^2} \\ &= \frac{0.9604}{0.0025} = 384 \text{ patients} \end{aligned}$$

Therefore,

$$nf = \frac{384}{(1+384) / 128} = 128 \text{ patients}$$

However at the data collection stage, the researcher administered the questionnaires to 133 PTB patients.

3.8 Instrumentation

An in-depth review of literature on related research was undertaken before and during the development of the questionnaire. Several items were developed for each of the complex variables (knowledge of TB, stigma and perception of quality of services in public health facilities). Data was collected using a semi-structured questionnaire administered by the researcher and a trained research assistant (a nurse).

3.8.1 Reliability

An adequate number of questionnaires were pre- tested and ambiguities clarified. The research assistant underwent thorough training in enumeration before and after pre-testing.

3.8.2 Validity

For complex variables like knowledge of TB, perception of quality of services in public health facilities and stigma, a series of questions addressing each variable was incorporated in the questionnaire and a summary indicator determined from the responses. Also in-depth literature review was done and opinions sought from experts in NLTP and research supervisors.

3.9 Pilot Study

The questionnaire was translated in to Kiswahili and Kikamba and transcribed to check accuracy then pre-tested on 20 PTB patients in two other health facilities namely; Masongaleni and Nthongoni Dispensaries in Kibwezi District. The questionnaire was administered in English, Kiswahili or Kikamba depending on the patient's preference. Ambiguities in translations were clarified and appropriate modifications done on affected items.

3.10 Data Collection Techniques

The researcher and research assistant visited each health facility at least three times during the 8 week period of the survey. Each visit was planned to coincide with a clinic day (usually a week day) when all the newly diagnosed patients and those in the intensive phase of treatment went for a review and to collect drugs for the next week. The questionnaire was administered in a private room in English, Kiswahili or Kikamba according to the patient's preference after the patients had been seen by the clinician. Consecutive patients were invited to participate and informed verbal consent obtained before administering the questionnaire. It took 20-30 minutes to administer the questionnaire to each respondent.

3.11 Data Analysis

Data were entered and analyzed using Epi Info version 3.4.3. Descriptive statistics performed included determining the means, medians, standard deviations (SD) and range.

Delay of more than 30 days was considered as a long delay because NLTP guidelines suggest that patients coughing for more than 2 weeks/ 14 days should seek specialized treatment (MoH, 2006). Patient delay was dichotomized in to; lesser delay (≤ 30 days) and longer delay (> 30 days). The univariate analysis involved comparing each independent variable with longer patient delay. The significance of the associations was tested using Chi Square and an association was statistically significant when the p- value was less than 0.05 ($p < 0.05$). The variables with a p- value < 0.05 in the univariate analysis were included in the Multiple Logistic Regression analysis where odds ratio (OR) and associated confidence interval (95% CI) was used to measure the strength of association between the independent variables and longer patient delay.

3.12 Ethical Considerations

The study was approved by Board of Postgraduate Studies of Kenyatta University and the Ministry of Education Science and Technology. Clearance to collect data was obtained from the District Commissioner Kibwezi District, who is the representative of Office of the President in the district. Clearance was also sought from the Medical Officer of Health (MOH) in charge of all the public health facilities in the district. Participants were requested to a give an informed verbal consent to be interviewed. All the information was treated with a high degree of confidentiality.

CHAPTER IV

RESULTS AND DISCUSSION

4.1 Socio-demographic Characteristics of the Study Subjects

One hundred and thirty three (133) study subjects were interviewed in five public health facilities in Kibwezi District representing 104% of the sample size. The proportion of study subjects interviewed in each health facility is shown in Figure 2.

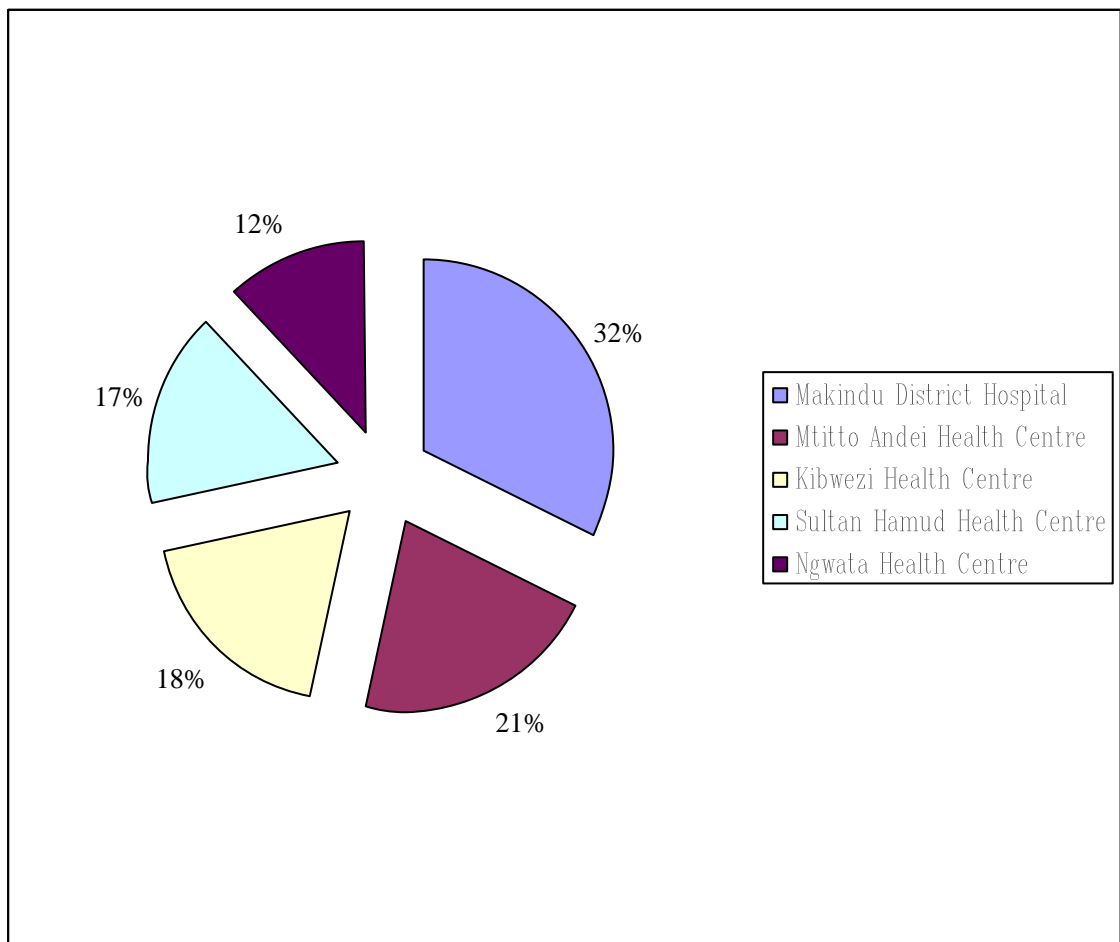


Figure 2: Proportion of study subjects interviewed in the five public health facilities (n = 133)

The sample consisted of approximately 53% males and 47% females. The mean and median age was 35 and 33 years respectively. Fifty two (39%) of the study subjects were aged between 25-34 years (Figure 3).

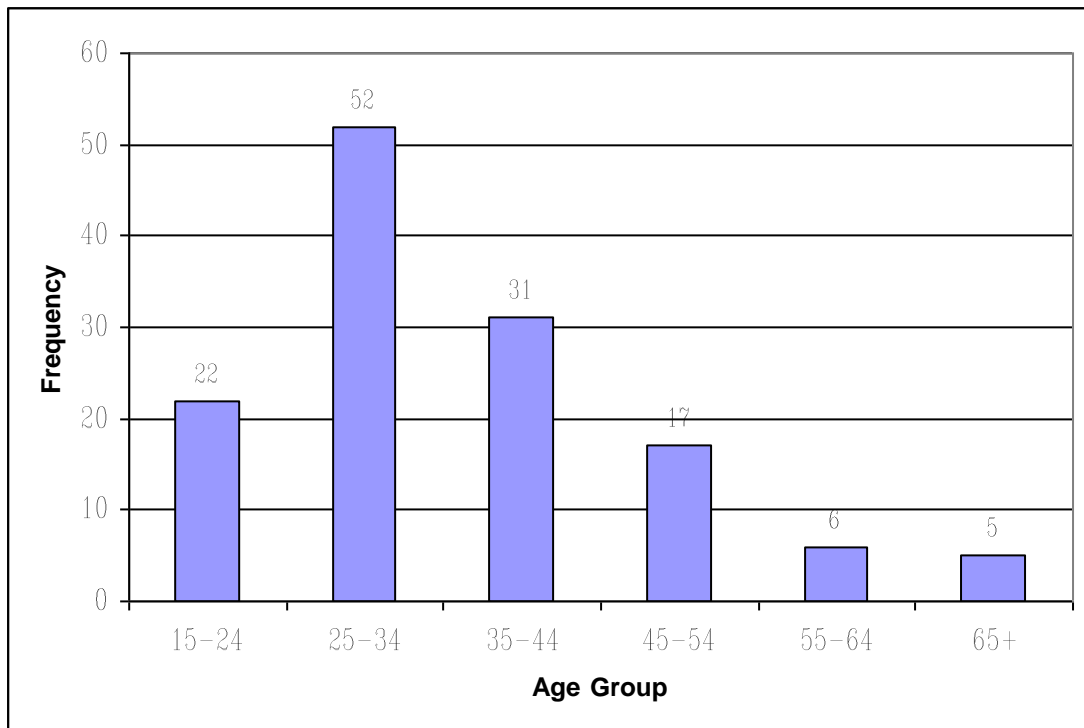


Figure 3: Age distribution of study subjects (n = 133)

Seventy seven (57.9%) were married and 60 (45.1%) of the patients were HIV positive. Eighty three (62.4%) of the study subjects had either primary education or had no formal education. Sixty one (45.9%) could only perform light chores in their homes (were moderately ill) by the time of seeking TB treatment from a government/public health facility while 50 (37.6%) were severely ill (house bound or bed ridden) and 22 (16.5%) were not hampered by the TB (could still do a full days work) by the time of first visit to a public health facility (Table 1).

Table 1: Socio-demographic characteristics of study subjects (n = 133)

Variable	Frequency	Percentage (%)
Gender		
Male	70	52.6
Female	63	47.4
Level of Education		
None	10	7.5
Primary	73	54.9
Secondary	41	30.8
College graduate	9	6.8
Marital status		
Single	42	31.6
Married	77	57.9
Widow/Widower	14	10.5
HIV status		
Positive	60	45.1
Negative	55	41.4
Do not know	18	13.5
Severity of illness		
Not hampered	22	16.5
Moderate	61	45.9
Severe	50	37.6

Fifty seven (42.1%) of the patients took 2-3 hours to reach the nearest public health facility and 33 (24.8%) took over 4 hours. Seventy seven (57.9%) spent more than Kenya Shillings (Ksh) 100 (US\$1.3) as transport to and from the public health facility. *Matatus* (public transport vehicles) were the most frequently used means of transport used by 68 (51.1%), followed by *Boda Boda* (bicycle taxi) which were used by 40 (30.1%) of the patients (Table 2).

Table 2: Distribution of study subjects by duration, cost and means of transport used to access a Government/public health facility (n = 133)

Variable	Number	Percentage (%)
Duration		
0-1hr	43	33.1
2-3hrs	57	42.1
Over 4hrs	33	24.8
Means of transport		
Walk	25	18.8
Boda Boda	40	30.1
Matatu	68	51.1
Cost of transport		
Less than Ksh 100	56	42.1
Ksh 101 and above	77	57.9

4.2 Patient Delay

The mean patient delay was 54.1 days (SD = 14; median = 53.5) and a range of 7- 120 days. Eighty seven (65.4%) of the PTB patients had delayed for more than 30 days before seeking treatment from a government/public health facility.

4.2.1 Patient Delay and Socio-demographic Factors

Age and Gender

The mean age of males was 40 years (SD = 13; median = 39) and that of females was 29 years (SD = 7; median = 28). Forty nine (67.1%) of the males compared to 38 (63.3%) of the females had delayed for more than 30 days (Table 3).

Males had a mean patient delay of 51.2 days (SD= 9; median= 51), while females had a mean patient delay of 57.6 days (SD= 11.6; median 56).

Table 3: Proportion of PTB patients with longer delay according to age and gender (n = 133)

Variable	Lesser delay (≤ 30 days) n (%)	Longer delay (> 30 days) n (%)	Total	OR {Long delay (95% CI)}	p-value
Total Interviews	46(34.6)	87 (65.4)	133	-	-
Age					
15-44	34 (32.4)	71 (67.6)	105	0.70 (0.3-1.6)	0.5422
45-65+	12 (42.9)	16 (57.1)	28	2.2 (0.2-20.3)	0.4268
Gender					
Male	24 (32.9)	49 (67.1)	73	0.65 (0.4-2.6)	0.5321
Female	22 (36.7)	38 (63.3)	60	0.78 (0.5-3.8)	0.6426

No significant association was established between age and longer patient delay {delay of more than 30 days}, (p = 0.4268). Similarly the role of gender in patient delay was not significant (p = 0.5321) (Table 3 above).

Marital Status

The number of widows/widowers who had a longer delay was smaller 7 (50%), than that of single 29 (69.0%) and married 51 (63.6%) patients. About four (57.0%) of the widows/widowers were HIV positive. The role of marital status in patient delay was not found to be significant by this study {(p = 0.1015) (Table 4)}.

HIV Status

Forty one (68.3%) of the HIV positive PTB patients reported longer delays compared to 34 (61.8%) of the HIV negative and 12 (66.7%) of the patients who did not know their status (Table 4). The role of HIV status in patient delay was not statistically significant (p = 0.0950).

Table 4: Proportion of PTB patients with longer delay according to marital and HIV status (n = 133)

Variable	Lesser delay (≤ 30 days) n (%)	Longer delay (> 30 days) n (%)	Total	OR{Long delay (95% CI)}	p-value
Total Interviews	46 (34.6)	87 (65.4)	133	-	-
Marital status					
Single	13 (31.0)	29 (69.0)	42	0.85 (0.4-1.9)	0.8309
Married	26 (33.8)	51 (62.6)	77	0.80 (0.4-1.7)	0.7028
Widow/Widower	7 (50.0)	7 (50.0)	14	3.25 (0.7-15.0)	0.1015
HIV status					
Positive	19 (31.7)	41 (68.3)	60	2.03 (1.0-4.3)	0.0982
Negative	21 (38.7)	34 (61.8)	55	0.55 (0.3-1.2)	0.1600
Do not know	6 (33.3)	12 (66.7)	18	0.73 (0.3-2.1)	0.7579

Level of Education

Sixty percent (60.0%) of those with no formal education had a longer delay compared to 57.5% of those who had primary level of education, 61.0% of those with secondary level of education and 55.6% of the college graduates (Figure 4). The level of education was however not found to be significantly associated with longer patient delay ($p = 0.5332$).

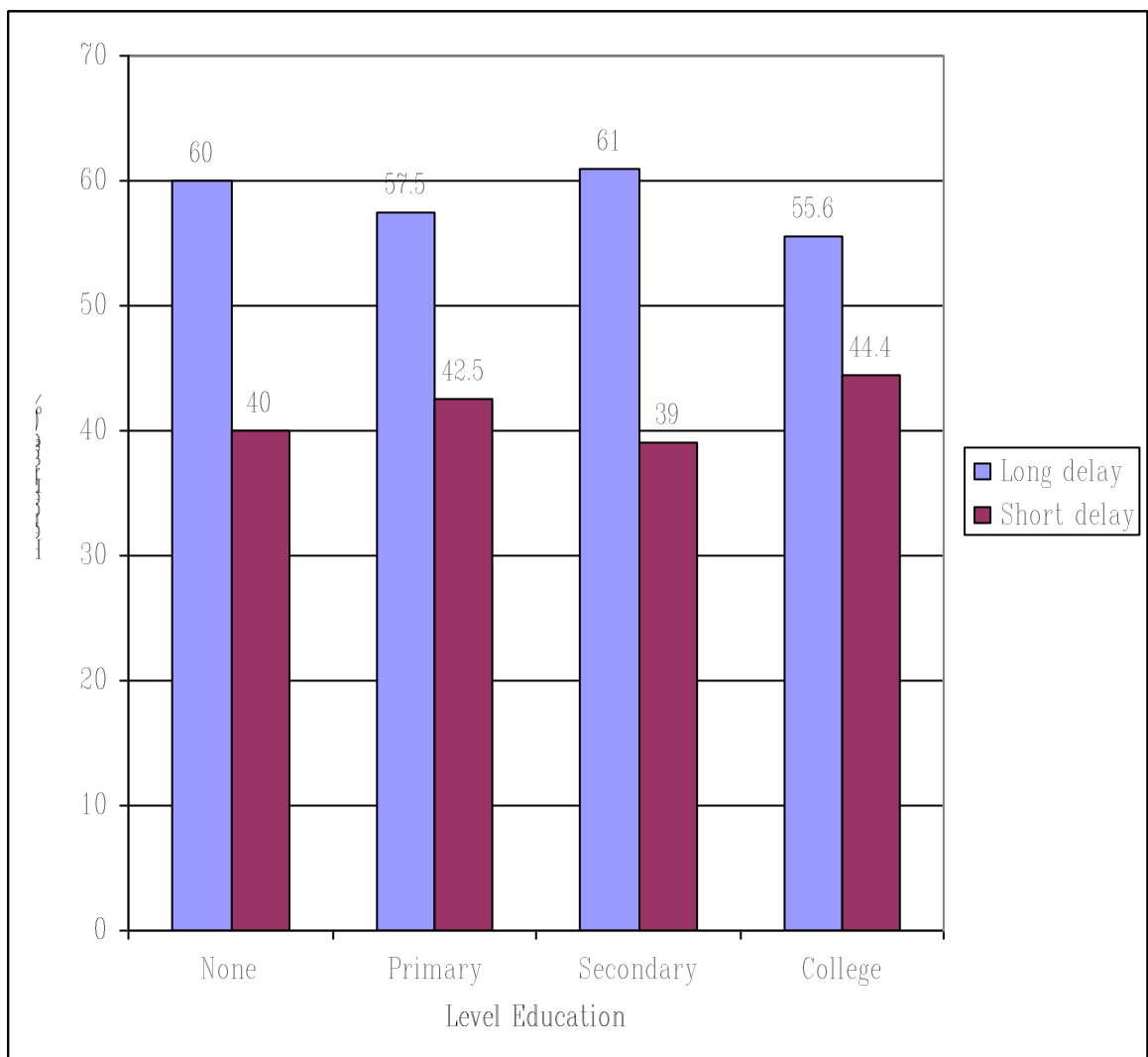


Figure 4: Patients with long and short delay according to education level (n = 133)

Severity of Illness

Forty five (90.0%) of the severely ill patients reported a longer delay compared to 8 (36.4%) of the patients who were not hampered and 33 (54.1%) of those who were moderately ill (Figure 5).

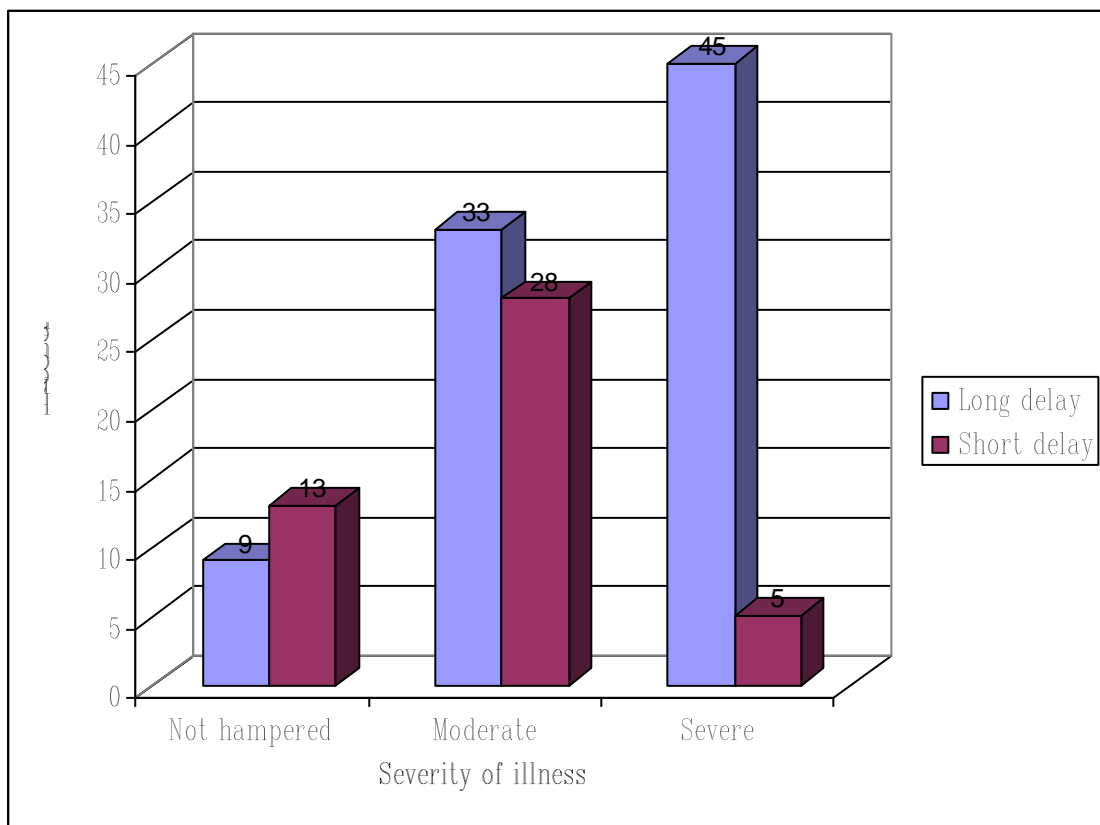


Figure 5: Patients with long and short delay according to severity of illness (n = 133)

A significant association was established between longer patient delay and the severity of illness at the time of first visit to public health facility in the univariate analysis ($p= 0.00001$). This association did not remain significant in the Multiple Logistic Regression Analysis (Table 10).

Duration to the Health Facility, Cost and Means of Transport

The PTB patients who took more than 2 hours to get to a public health facility tended to delay longer. Thirty five (61.4%) of those who lived 2-3 hours away and 29 (87.9%) of the patients who took over 4 hours reported delay of more than 30 days (Table 5).

Fifteen (60.0%) of the PTB patients who had to walk to the public health facility, 26 (65.0%) of those patients who used a *Boda Boda* and 46 (67.6%) of those who used a *Matatu* reported longer delay (Table 5).

The proportion of patients with longer delay among those who spent less than Ksh100 (<US\$1.3) and those who spent more than Ksh 100 (>US\$ 1.3) was over 60.0%. Forty six (67.6%) of patients who used *Matatus* to access the health facility reported longer delay. Using a *Matatu* to access the health facility was significantly associated with having to commute a distance of over 4 hours (OR = 2.37; CI: 0.95-5.25; p = 0.0132) and spending over Ksh 100 (>US\$1.3) on transport costs (OR = 20.75; CI: 7.69-56.0; p = 0.00001). In the univariate analysis, the means of transport used to get to the health facility (p = 0.1445) and the amount of money spent on transport (p = 0.0580) were not significantly associated with longer delay (Table 5).

However the association between longer patient delay and having to commute for over 4 hours to the health facility found to be significant in the univariate analysis (p= 0.0003) (Table 5), did not remain so in the Multiple Logistic Regression Analysis (Table 10).

Table 5: Proportion of PTB patients with longer delay according to duration to the health facility, cost and means of transport (n = 133)

Variable	Lesser delay (≤ 30 days) n (%)	Longer delay (> 30 days) n (%)	Total	OR {Long delay (95% CI)}	p-value
Total Interviews	46 (34.6)	87 (65.4)	133	-	-
Duration					
0-1hr	20 (46.5)	23 (53.5)	43	0.44 (0.2-0.9)	0.0553
2-3hrs	22 (38.6)	35 (61.4)	57	0.61 (0.3-1.3)	0.2574
Over 4hrs	4 (12.1)	29 (87.9)	33	11.5 (2.6- 50.9)	0.0003
Transport means					
Walk	10 (40.0)	15 (60.0)	25	0.64 (0.3-1.6)	0.4775
Boda Boda	14 (35.0)	26 (65.0)	40	0.67 (0.3-1.5)	0.4250
Matatu	22 (32.4)	46 (67.6)	68	1.86 (0.9-3.9)	0.1444
Cost of transport					
<Ksh100	21 (37.5)	35 (62.5)	56	0.44 (0.2-1.0)	0.0580
>Ksh101	25 (32.5)	52 (67.5)	77	0.57 (1.0-2.9)	0.1679

4.2.2 Patient Delay and the Choice of First Health Care Provider

Sixty (45.1%) of the patients sought treatment from a private clinic first, 42 (31.6%) sought treatment from chemists/pharmacy, 16 (12.0%) went to a public hospital first, 12 (9.0%) went to a public health centre or dispensary, and 3 (2.3%) consulted a herbalist/traditional healer (Figure 6).

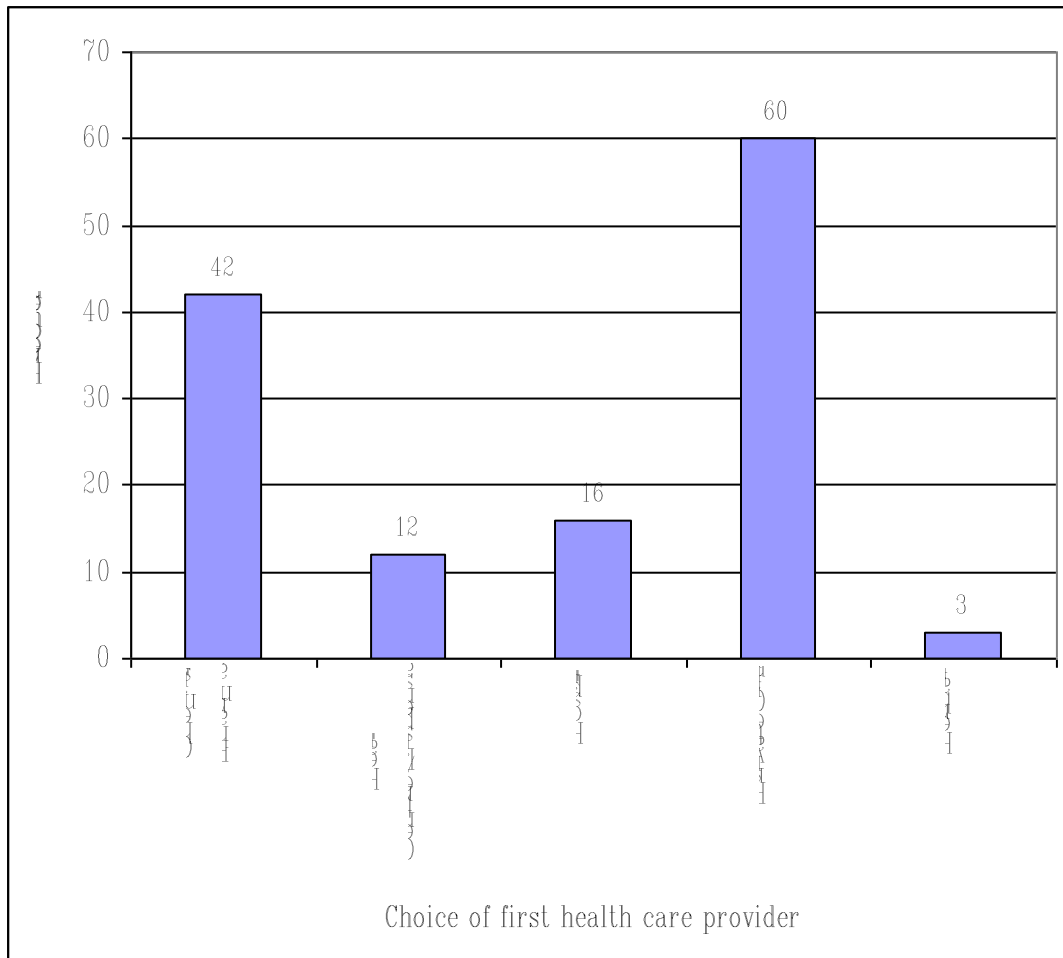


Figure 6: Choice of first health care provider (n = 133)

Forty nine (81.7%) of the patients who visited a private clinic, 27 (64.3%) of those who visited chemist/pharmacy and 2 (66.7%) of those who visited an herbalist reported longer delay (Table 6). A significant association was found between the choice of first health care provider and longer delay. Seeking treatment from a private clinic first was significantly associated with longer patient delay in the univariate analysis ($p= 0.00001$) whereas visiting a health centre/dispensary (OR = 5.85; CI: 1.47-23.4; $p = 0.0090$) or a government hospital (OR = 9.88; CI: 2.61-37.3; $p = 0.0003$) first were significantly associated with lesser patient delay (Table 6).

Table 6: Proportion of PTB patients with longer delay according to the choice of first health care provider

Variable	Lesser delay (≤ 30 days) n (%)	Longer delay (> 30 days) n (%)	Total	OR {Long delay (95% CI)}	p-value
Total Interviews	46 (34.6)	87 (65.4)	133	-	-
Health provider					
Chemist/ Pharmacy	15 (35.7)	27 (64.3)	42	0.99 (0.5-2.2)	0.8509
Health Centre/ Dispensary	9 (75.0)	3 (25.0)	12	0.17 (0.04-0.7)	0.0090
Government Hospital	10 (62.5)	6 (37.5)	16	0.10 (0.03-0.4)	0.0003
Private Clinic	11 (18.3)	49 (81.7)	60	5.31 (2.3-12.0)	0.0001
Herbalist	1 (33.3)	2 (66.7)	3	-	0.4217

Patients were more likely to visit a private clinic if they had to commute for 2 or more hours to get to the nearest public health facility (OR = 11.5; CI: 2.6-50.9; p = 0.0003).

4.2.3 Patient Delay and Knowledge and Perception of TB disease

Fifty five (41.4%) of the patients had an average score on TB knowledge, 42 (31.6%) had a good knowledge score and 36 (27.0%) had a poor knowledge score (Figure 7). Eighty one (60.9%) knew that there is a relationship between TB and HIV. Fifty two (39.1%) believed that TB is a very serious disease, 60 (45.1%) believed that it is serious, 10 (7.5%) said TB was slightly serious and 11 (8.3%) believed that TB disease was not serious (Table 7).

Most (94.0%) of the 133 patients reported that TB can be transmitted from person to person and 96.2% said that TB was curable.

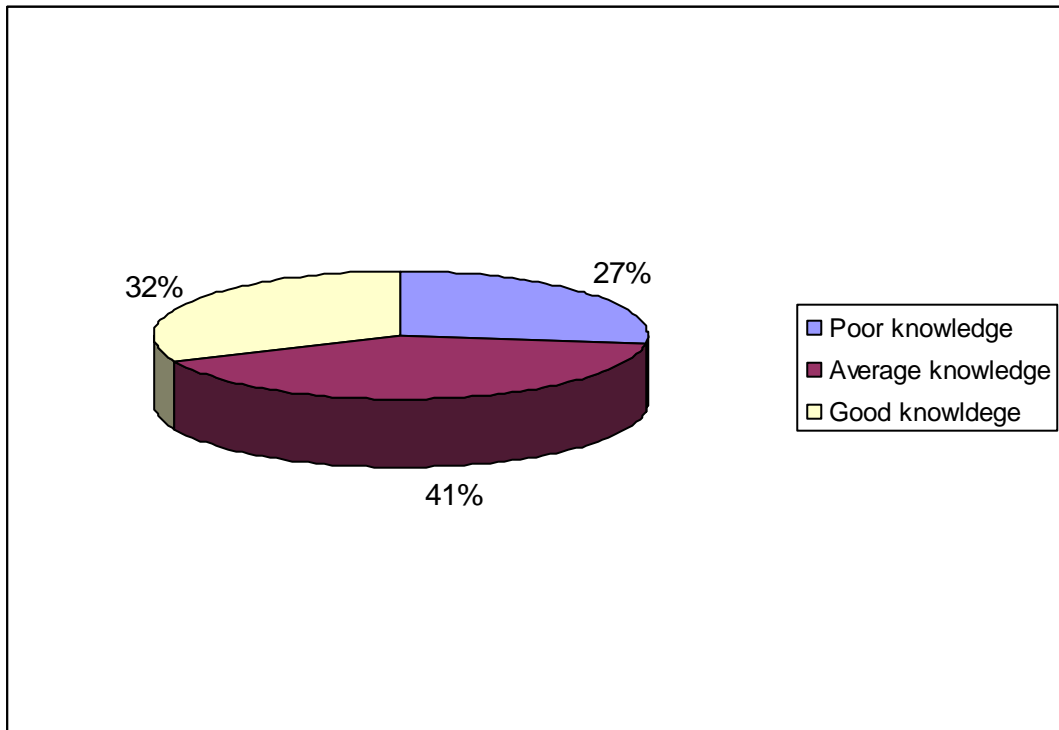


Figure 7 TB patients' knowledge score (n = 133)

There was no significant difference between the proportion of patients who delayed longer among those with poor TB knowledge score (69.4%) and those with an average TB knowledge score (67.3%), (Table 7). The contribution of this factor to patient delay was not statistically significant in this study (OR = 0.39; CI: 0.2-0.8; $p = 0.0264$). Similarly the proportion of PTB patients who delayed longer among those who perceived TB to be a 'very serious disease' (63.5%) and those who perceived the disease as 'not serious' (63.6%) was not significant. The perceived seriousness of TB disease was not found to have significant influence on patient delay in this study ($p = 0.5005$).

Table 7: Proportion of PTB patients with longer delay according to level of TB knowledge and perception of TB disease (n = 133)

Variable	Lesser delay (≤ 30 days) n (%)	Longer delay (> 30 days) n (%)	Total	OR {Long delay (95% CI)}	p-value
Total Interviews	46 (34.6)	87 (65.4)	133	-	-
Knowledge of TB					
Poor	11 (30.6)	25 (69.4)	36	1.86 (0.6-4.6)	0.2509
Average	18 (34.5)	37 (67.3)	55	1.51 (0.7-3.2)	0.3734
Good	17 (40.5)	25 (59.5)	42	0.39 (0.2-0.8)	0.0264
Perception of TB					
Very serious	16 (30.8)	36 (69.2)	52	1.44 (0.7-3.1)	0.4472
Serious	21 (35.0)	39 (65.0)	60	0.61 (0.3-1.3)	0.2681
Slightly serious	5 (50.0)	5 (50.0)	10	1.08 (0.1-12.2)	0.7210
Not serious	4 (36.4)	7 (63.6)	11	1.23 (0.4-4.3)	0.5005

4.2.4 Patient Delay and Stigma

Fifty seven (42.9%) of the patients reported low stigma, 56 (42.1%) reported average stigma and 20 (15.0%) reported high stigma. The proportion of patients with longer delay was large among PTB patients who reported ‘average stigma’ (78.6%) and ‘high’ stigma (80.0%) and both levels of stigma were associated with delay in the univariate analysis (Table 8).

Table 8: Proportion of PTB patients with longer delay according to stigma (n = 133)

Variable	Lesser delay (≤ 30 days) n (%)	Longer delay (> 30 days) n (%)	Total	OR {Long delay (95% CI)}	p-value
Total Interviews	46 (34.6)	87 (65.4)	133	-	-
Stigma					
Low	30(52.6)	27 (47.4)	57	0.30 (0.1-0.6)	0.0028
Average	12(21.4)	44 (78.6)	56	1.54 (1.2-4.6)	0.0076
High	4 (25.5)	16 (80.0)	20	6.10 (0.6-15.7)	0.0004

4.2.5 Patient Delay and Perception of the Quality of Health Services

Fifty two (39.1%) patients had a poor perception of the quality of services offered in public health facilities, 44 (33.1%) perceived services as average and 37 (27.8%) perceived the services as being of good quality. Although 94.7% of the sample size felt that staff in public health facilities were qualified to diagnose and treat TB, 68% felt that the waiting time was long, 72% felt that the staff did not enquire about the patients' progress and 82% felt that the staff did not give patients time to ask questions where they needed clarification. Shortage of drugs was also reported by 53% of the patients.

Most 46 (88.5%) of the patients who had a poor perception of the quality of health services in public health facilities reported a longer delay compared to 18 (48.8%) of those who had a good perception (Table 9).

Indeed a significant association was found between poor perception of the quality of services and longer delay in both univariate ($p = 0.0005$), (Table 9) and Multiple Logistic Regression Analysis ($p = 0.0061$) while good perception was associated with lesser patient delay (OR = 2.86; CI: 1.3-6.4; $p = 0.01784$).

Table 9: Proportion of PTB patients with longer delay according to perception of the quality of services in government/public health facilities (n = 133)

Variable	Lesser delay (≤ 30 days) n (%)	Longer delay (> 30 days) n (%)	Total	OR {Long delay (95% CI)}	p-value
Total Interviews	46 (34.6)	87 (65.4)	133	-	-
Perception of services					
Poor	6 (11.5)	46 (88.5)	52	6.99 (2.7-18.3)	0.00005
Average	21 (47.7)	23 (52.3)	44	0.47 (0.2-1.0)	0.07717
Good	19 (51.4)	18 (48.6)	37	0.35 (0.2-0.8)	0.01784

4.3 Multiple Logistic Regression Analysis

The factors found to be significantly associated with longer patient delay in the univariate analysis were; having visited a private clinic ($p = 0.0001$), poor perception of the quality of services in public health facilities ($p = 0.00005$), being severely ill at the time of first visit to a public health facility ($p = 0.00001$) and having to commute for over 4 hours to get to a public health facility ($p = 0.0003$) and experiencing 'Average' ($p = 0.0076$) and 'High' ($p = 0.0004$) levels of stigma.

The results of Logistic Regression Analysis showed that poor perception of the quality of services in public health facilities ($p = 0.0061$), visiting a private clinics ($p = 0.0052$) and experiencing 'High' ($p = 0.0178$) stigma remained independent predictors of longer patient delay (delay of more than 30 days), {Table 10}.

Table 10 Predictors of longer patient delay (n = 133)

Risk factor	Odds Ratio (95% CI)	p - value
Duration of over 4hrs	2.126(0.364-12.438)	0.4026
Severely ill	3.006(0.805-11.229)	0.1016
Visiting private clinic	4.238(1.539-11.673)	0.0052
Poor perception of quality of services	4.918(1.576-15.348)	0.0061
Stigma		
Average	0.786(0.894- 2.316)	0.6082
High	2.456(1.919- 12.24)	0.0178

4.4 Discussion

The study sample consisted of more males than females. Similar trends have been established in other related studies (Demissie *et al.*, 2002; Cambanis *et al.*, 2005; Kiwuwa *et al.*, 2005). This may imply gender bias in passive case finding (Needham *et al.*, 2001; Kasse *et al.*, 2006; Cassels *et al.*, 1982) or that more men than women are indeed affected by TB in Kibwezi District. The Ministry of Health (2006) reported that men are 1.4 times more likely to have TB than women.

Tuberculosis affects the economically productive age of 15-45 years and the most affected age group is 25-35 years (NLTP, 2005). In this study 78.9% of the PTB patients were aged 15-44 years and those aged 25-35 years constituted 39.1% of the sample size. Twenty eight (54%) of patients in this age group were HIV positive, the highest among the all age groups. This finding is in line with the NLTP 2007 report that the same age group had the highest sero-prevalence (NLTP, 2007).

4.4.1 Mean Patient Delay and Proportion of PTB Patients with Longer Delay

Patient delay was long (mean = 54.1 days; median = 53.5 days) and majority (65.4%) of the patients presented at a public health facility more than 30 days after the onset of the symptoms. Demissie *et al.*, (2002) and Cambanis *et al.*, (2005) reported similar proportions of 58.4% and 65.0% respectively in Ethiopia. The mean patient delay for this study was however found to be shorter compared to 78.2 days and 272 days in Ethiopia (Demissie *et al.*, 2002 and Cambanis *et al.*, 2005) respectively, 89.6 days in Ghana (Lawn *et al.*, 1997) and 161.7 days in Tanzania (Wandwalo *et al.*, 2000).

This may be a reflection of improved awareness of health problems and better access to health care in the study population.

4.4.2 Age, Gender and Marital Status

The mean patient delay was slightly shorter for males (51 days) than for females (54 days) although a larger proportion of the males delayed longer than the females. The slight difference may be because the women may have had to depend on their husbands or other family members to raise money for transport. Women are also the primary care givers in homes and lack of time may be a contributor to the slightly longer delay. Long patient delays have been reported in women by Needham *et al.*, (2001).

Although the role of gender, age and marital status in longer patient delay was not statistically significant, this study revealed that male PTB patients were older (mean age = 40) than female patients (mean age = 29), a finding similar to that of a study in Uganda (Kiwuwa *et al.*, 2005). This may be attributed to the high HIV prevalence in TB patients. Females infected with HIV tend to be younger than the males because of early sexual debut in girls. Rampant poverty makes young girls in Kibwezi District tend to have male sexual partners who are older and have a source of income. Some of these males may already have been exposed to HIV/AIDS.

4.4.3 HIV Status

Eighty four (63.2%) of the patients of the patients knew that there is an association between TB and HIV. A study in Thailand (Ngamvothayapong *et al.*, 2001) found patient delays to be shorter in HIV positive PTB patients because these suffered more symptoms.

This study did not find the role of HIV status significant in patient delay. However slightly more of the HIV positive PTB patients delayed longer than the HIV negative patients. There is a possibility that HIV positive PTB patients may have been aware of their HIV status and this may have made them loose hope of recovery hence hesitating to seek treatment. The observed difference, albeit small, may be also due depletion of financial resources in the course of seeking treatment for their HIV.

4.4.4 Level of Education

Educated people may have a better awareness of health problems such as TB and therefore seek treatment promptly. But studies in Zambia (Godfrey-Faussett *et al.*, 2002), Uganda (Kiwuwa *et al.*, 2005) and Nigeria (Odusanya *et al.*, 2004) found no association between education level and patient delay. In this study, PTB patients with low levels of education (lack formal education or have primary level of education) tended to have longer patient delay. However no association was established between the level of education and longer patient delay.

4.4.5 Severity of Illness

Majority (90.0%) of the patients who were severely ill at the time of first visit to a public health facility had delayed for more than 30 days. This may be because the patients had to be carried to the health facility which is expensive but it could also be that those who delay longer develop more severe symptoms (Madebo and Lindtjorn, 1999). This study did not find the association between the severity of illness and longer patient delay significant; a finding similar to that of a study in Uganda (Kiwuwa *et al.*, 2005).

The significant association observed between haemoptysis and longer patient delay may be because the patients may not perceive the prolonged cough as serious unless it is accompanied by other severe symptoms like coughing blood.

4.4.6 Duration, Cost and Means of Transport

The duration, cost and means of transport used to get to the public health facility was used to get an indication of how accessible these facilities were. Although most (66.9%) of the PTB patients of the patients had to commute for 2 or more hours to the nearest public health facility and 57.9% spent over Ksh 100 (US\$1.3) in transport, this study did not find the role of these factors in longer patient delay statistically significant. Some studies carried out in urban Ethiopia (Demissie *et al.*, 2002) and Zambia (Godfrey-Faussett *et al.*, 2002) reported a significant association between duration taken to reach the centre and longer patient delay. It must be noted that this study was done in a rural setting and therefore the study population may have been significantly different from those in Addis Ababa and Lusaka.

4.4.7 Choice of Health Care Provider

The increasing population poses the challenge of providing quality health care services in Kenya. Private clinics and chemists/pharmacies have mushroomed to take advantage of the increasing health care needs. This study found that private clinics were most frequently visited first, followed by the chemists/pharmacies. Kiwuwa *et al.*, (2005) also reported that PTB patients sought treatment from private clinics and pharmacies/drug stores more commonly than from government health units. Most of these are however run by personnel who do not have formal training in the medical field particularly TB and lung diseases which makes diagnosis and management of TB inadequate (Godfrey- Faussett *et al.*, 2002). A recent study in Oman (Al- Maniri *et al.*, 2008) established that private practitioners had significantly lower TB knowledge scores and TB suspicion compared to public practitioners. The significant association between visiting a private clinic and longer delay observed in this study may therefore be due to the repeated administration of doses of non-specific antibiotics when the patients returned due to failure of symptoms to disappear.

Repeated visits to the private clinics also depletes the patients limited financial resources needed for the TB diagnostic process and this may cause delay (Needham *et al.*, 1998; Gibson *et al.*, 1998; Lawn *et al.*, 1998). Significant associations were also established between being severely ill and visiting a private clinic (OR = 2.84; CI: 1.3 – 6.0; p = 0.0087) and also having to commute for two and more hours and visiting a private clinic (OR = 2.50; CI: 1.1 – 5.8; p= 0.02163).

Visiting private clinics by patients who had to commute for two and more hours to get to the nearest health facility may be an indicator of constrained access to appropriate TB treatment in this group. Several other studies found significant association between visiting a private clinic and prolonged patient delay (Rojpibulstit *et al.*, 2006; Godfrey - Faussett *et al.*, 2002; Lawn *et al.*, 1998; Needham *et al.*, 2001; Odusanya and Babafemi, 2004).

This study also established that of all the PTB patients who sought treatment from the private clinics, only 8.3% reported having been influenced to seek the appropriate TB treatment by the personnel at the private clinic. This finding concurs with findings by Tesena *et al.*, (1991) who found progression towards specialized TB services to be poor among patients who sought treatment from a private clinic. This may be because health personnel's knowledge on TB symptoms is inadequate hence low suspicion index or that the private clinics may be more interested in profit making and thus try to 'hold' the patients as long as possible.

4.4.8 Knowledge and Perception of TB Disease

Knowledge is an important component of self-care and many studies and literature advocate increasing awareness of TB as a means to shorten patient delay (Lewis *et al.*, 2003; Madebo and Lindtjorn, 1999; Rajeswari *et al.*, 2002; Steen and Mazonde, 1999; Kiwuwa *et al.*, 2005; MoH, 2006).

Majority of the patients in this study had average knowledge of TB and the number of patients with good knowledge of TB increased with the increasing levels of education. Most (85.7%) of the patients in this study said that TB was a “very serious” or “serious” disease while the minority (13.0%) did not think that TB was serious.

Almost all the patients believed that TB is curable a probable indication that campaigns by NLTP emphasizing the curability of TB in print and electronic media are changing the past perception that the disease is incurable (Liefoghe *et al.*, 1997).

This study did not find the perceived seriousness of TB to have a role in patient delay. This may mean that there may be other factors like health, economic and social impacts of TB disease (Karki, 2004) which influence decisions to seek effective treatment.

In this study, having a good score in TB knowledge and perceiving TB as a serious disease did not translate to early seeking of care. Experience in HIV/AIDS control programs has shown that knowledge of HIV/AIDS and of risks does not translate to appropriate behavioral change. This finding may have the implication that strategies aimed at controlling TB through improving awareness on TB symptoms and mode of transmission of the disease may not be successful unless emphasis is made on developing positive attitudes towards prevention and early treatment (Santos *et al.*, 2005). Like similar studies by Odusanya *et al.* (2004); Santos *et al.* (2004); Godfrey-Faussett *et al.* (2002), the role of TB knowledge and the perceived seriousness of TB disease in patient delay could not be established in this study.

4.4.9 Stigma

The stigma attached to TB due its close association with HIV (Ngamvithayapong *et al.*, 2000) or the perceived incurability and contagiousness of the disease have been linked to patient delay (Liefoghe *et al.*, 1997; Jaramillo, 1998).

Studies (Johansson *et al.*, 2000; Steen *et al.*, 1999; Long *et al.*, 2001; Lonnroth *et al.*, 2001) have recommended the importance of information on stigma to help understand how it influences health-seeking behavior. In this study most of the patients who reported experiencing ‘average’ and ‘high’ stigma sought treatment at a public health facility 30 days after the onset of symptoms. This study established a significant association between longer delay and stigma. Stigma attached to TB in many cultures may make people want to conceal their illness thus increasing the risk of transmission and also delaying health-seeking (Karki, 2004). Studies in different socio-cultural contexts (Johansson *et al.*, 2000; Liefoghe *et al.*, 1995; Steen *et al.*, 1999) have shown evidence that stigmatization of TB results in delayed health care seeking and in Kenya Liefoghe *et al.*, (1997) and the Ministry of Public Health and Sanitation reported stigma as a challenge in TB control (MoPH/S, 2007). However a study in Zambia (Godfrey-Faussett *et al.*, 2002) did not find stigmatizing attitudes to be associated with patient delay.

4.4.10 Perception of Quality of Services

The study found that a large proportion (88.5%) of patients who had a poor perception of the quality of services delayed longer. The study also established that poor perception of the quality of services in public health facilities to be associated with

longer patient delay, a finding similar to that by Godfrey- Fausett *et al.*, (2002) in a study on patient delay in Zambia, and Jaramillo (1998) in a Colombian study.

Although poor perception of health services has been found to be a risk factor for long delay among TB patients by studies outside Africa (Asch *et al.*, 1998; Jaramillo, 1998), the role of this factor in patient delay has been given little attention in Africa (Godfrey-Faussett *et al.*, 2002). And this is in spite of the challenges faced by many public health care systems in the continent like drug shortages and inadequate health care personnel. Since TB services are integrated in the general health care system in Kenya, the findings of this study underscore the need to improve the quality of public health care services as a means to promote early care seeking.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Implications of Findings

Promoting early care seeking through increasing awareness of TB in the population is still an effective way to ensure that TB cases are identified early and treated using effective chemotherapy. But such efforts are unlikely to be successful if the public have a poor perception of the quality of services in the public health facilities which almost exclusively offer TB diagnostic and treatment (DOTs) recommended by WHO in Kibwezi District. The role of private clinics in health care provision in Kibwezi District can no longer be overlooked. These are widely accepted and frequently used health care providers even though many are run by personnel without any formal training in management of TB. Stigma attached to TB is a constraint to seeking effective treatment early.

5.2 Conclusion

The mean patient delay among PTB patients in Kibwezi District is long and majority of the PTB patients had delayed for more than 30 days before seeking treatment from a public health facility. The factors associated with patient delay were found to be related to perception of quality of health care in public health facilities, prior attendance at private clinics and stigma. This study also established that good knowledge of TB and perception of TB as a serious disease did not translate to early care seeking.

5.3 Recommendations

- The particular aspects of health care services in public health facilities that most patients reported being most dissatisfied with were: the long waiting time, lack of encouragement and support in the course of recovery and failure of staff to give patients time to ask questions where they needed clarification and drug shortages. There is need for the Ministry of Medical Services to ensure that public health facilities have adequate staff and essential drugs. Addressing these issues vigorously can contribute towards changing the poor perception and promoting early care seeking. Communication skills training for health care workers in public health facilities can help change how the staff relate to patients hence improve the poor perception.
- PTB patients frequently visited private clinics when they developed initial TB symptoms. Very few if any private clinics in Kibwezi District have the equipment for TB diagnosis or offer the TB DOTS, independently or in collaboration with the MoPH&S. Visiting a private clinic first was significantly associated with longer delay in this study. This finding highlights the need to integrate the private clinics in rural areas into the National TB control programme. Personnel running private clinics need to be trained on signs and symptoms (to enhance their suspicion index), diagnosis and management of TB. Private clinics can also be allowed access to sputum microscopy and culture services in addition to availing TB drugs to them. A referral system can be developed to ensure rapid referral of patients from private clinics for more specialized services at the public hospitals.

Since strict adherence to the guidelines on TB diagnosis and treatment is critical in prevention of MDR-TB, the MoPH/S can consider strengthening the ability of DLTLD to supervise, monitor and evaluate activities in private clinics in order to promote adherence to set standards. Active case finding with the help of community workers can also be explored as an option to improve early case detection.

- Educational programmes aimed at reducing stigma need to be conducted.
- Since good knowledge of TB and perception of TB as a serious disease did not translate to seeking effective treatment early, health awareness campaigns should go beyond providing general information about TB to emphasize embracing a positive attitude to prevention of transmission through early treatment.

5.4 Further Research

Financial constraints limited this study to public health facilities in Kibwezi District. Similar studies can be done to determine the extent and contribution of various health care providers to patient delays at a national level. Delays to diagnosis and commencement of effective chemotherapy attributable to the health system factors can also be investigated.

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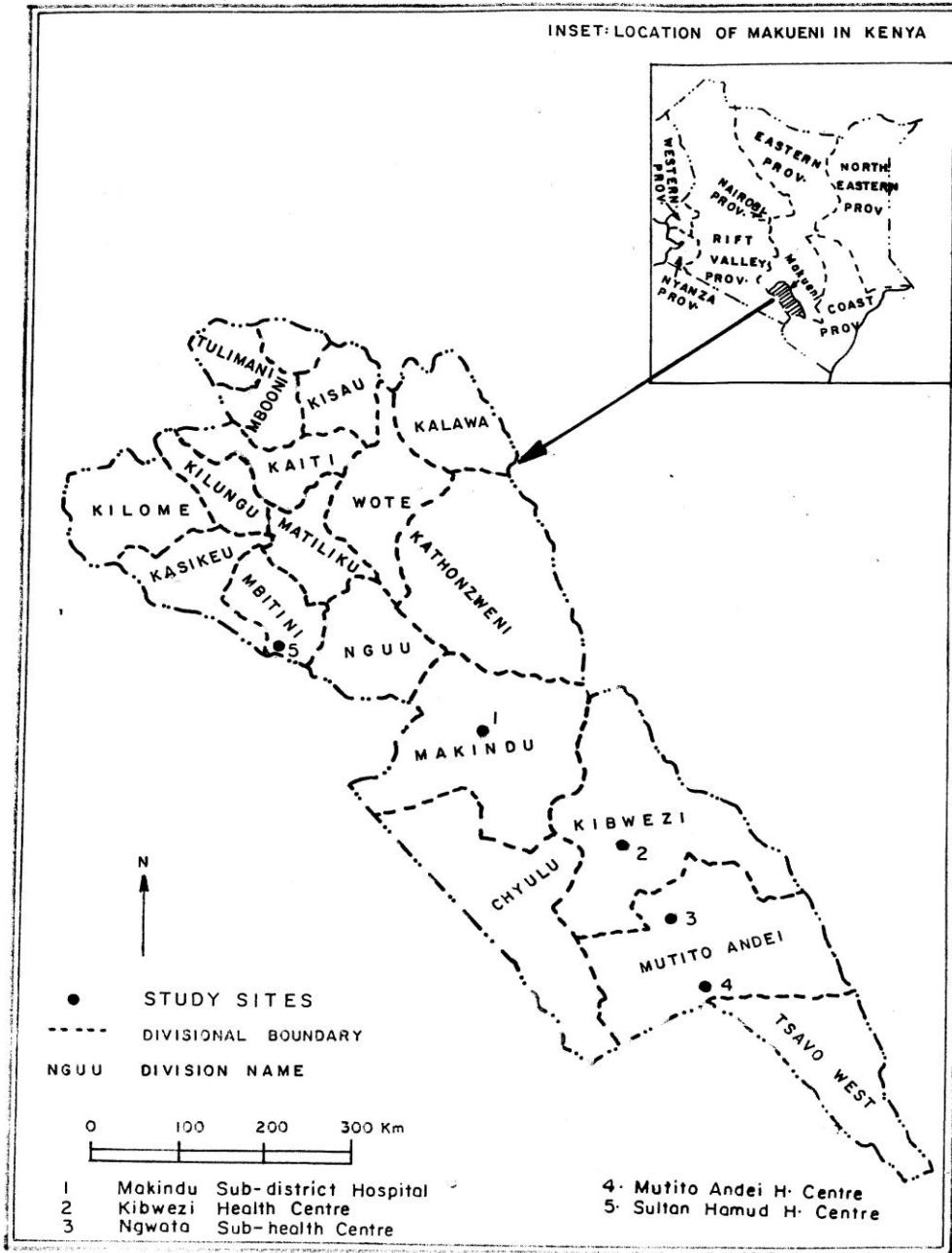
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Appendix 1- Map of Study Area



Appendix 2 – QUESTIONNAIRE

HEALTH FACILITY _____ **NAME** _____

PART 1 –SOCIO- DEMOGRAPHIC DATA

1. Age in Years

2. Sex

Male Female

3. Level of Education

None Primary Secondary College graduate

4. Marital status

Single Married Widow Widower

5. Type of PTB

Smear positive Smear negative

6. Duration it takes from home to the health facilities

0 – 1 hr 2 – 3 hrs Over 4 hrs

7. Means of transport used to get to health facilities

Bicycle Walk Vehicle (matatu)

8. Total cost incurred to and from the govt/public health facility

Less than Ksh 100 Ksh 101 and above

9. Severity of illness during the first visit to the health facility

- Could still do a full days work
 Could do only light chores outside the house
 Housebound / bed ridden

PART 3 – KNOWLEDGE AND PERCEPTION OF TB DISEASE, STIGMA & PERCEPTION OF SERVICES IN PUBLIC HEALTH FACILITIES

A. Knowledge of TB

16. TB is caused by

- A bacterium Dust Cold Hard work
 Witchcraft Smoking and/or alcohol

17. Can TB be transmitted from one person to another?

- Yes No

18. How is TB transmitted?

- Through infectious droplets don't know

19. What are the symptoms of TB?

- Persistent Cough
 Night Sweats
 Fever
 Chest pain
 Shortness of breath
 Weight loss
 Fatigue / Malaise
 Haemoptysis/coughing blood

20. Do you think there is a relationship between TB and HIV?

- Yes No

21. If yes, what is the relationship?

- HIV destroys body immunity making a person prone to getting TB
 Do not know

22. Where can free TB treatment be obtained?

- Government and mission health facilities
 Don't know

B. Perceptions of TB disease

23. Can TB be transmitted from one person to another?

Yes No

24. Do you consider TB disease

Very dangerous Not dangerous
 Dangerous Slightly dangerous

25. Do you believe that you can be completely cured of TB?

Yes No

26. Where in your opinion can proper TB treatment be obtained?

Dispensary Private Clinic
 Health Centre Traditional Healer
 Hospital Herbalist

C. Stigma

27. Did you think that family members would share a room with you without fear of getting infected with TB?

Yes No

28. Did you think that family members and other people would feel free to share plates, spoons and basins with you if they found out about your TB?

Yes No

29. Did you think that community members would still shake hands freely with you?

Yes No

30. Would you still remain friends with if you found that your friend has been diagnosed with TB?

Yes No

32. Do you know of friend's family members or any other people were sacked from their jobs because their employers discovered that they have TB?

Yes No

33. Did you think that your brother/sister/friend/spouse would share a bed with you if they found out that you had TB?

Yes No

34. Did you think that other people would ostracize you because of your TB?

Yes No

35. Did you think that you had HIV when you started experiencing the TB symptoms?

Yes No

C. Perception of services in government/public health facilities

*Please tick the number that best describes the patients feeling
The numbers represent the following responses*

1= Agree

2= Disagree

3= Neutral

36. Staff is qualified to diagnose and treat TB?

1 2 3

37. The health centre / hospital experiences drugs shortage

1 2 3

38. The staff is kind to the patients

1 2 3

39. The waiting time is short

1 2 3

40. The staff asks for bribes

1 2 3

41. The medical staff enquires about your progress and encourages you throughout the recovery period

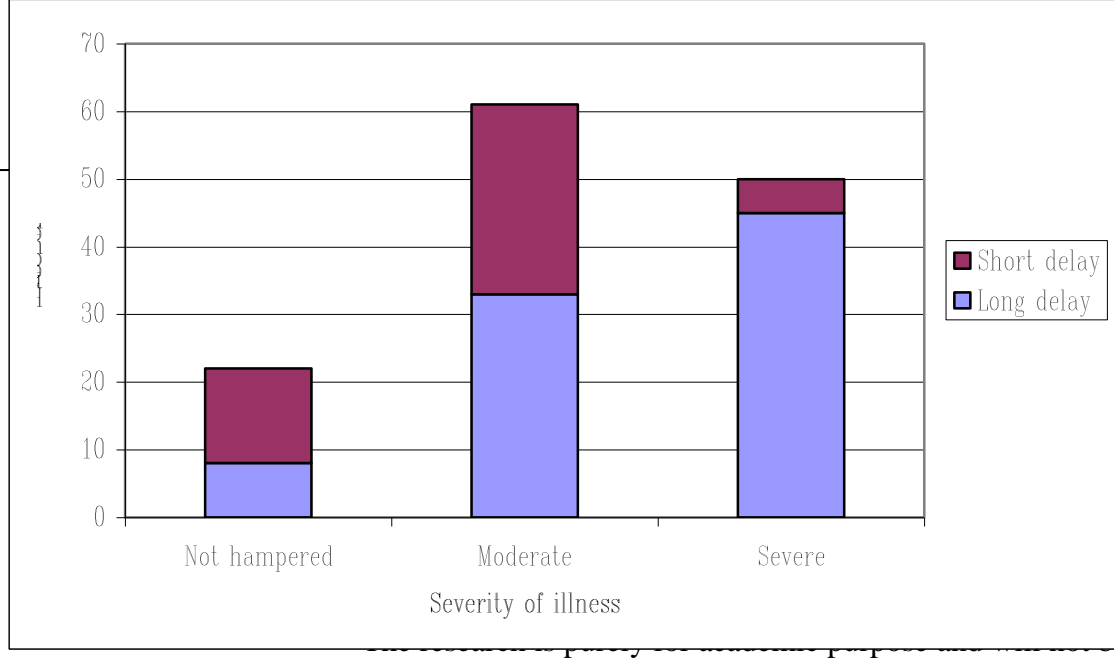
1 2 3

42. The medical staff gives patients time to ask questions whenever they need clarification

1 2 3

44. What is your HIV status?

Positive Negative do not know



, a student of
 , School of Health
 e used for any

monetary gain.

- All the information you give will be strictly confidential. Your name or address is not required and will not appear anywhere on the questionnaire.
- No reward/ token will be given to you for participating in this study.