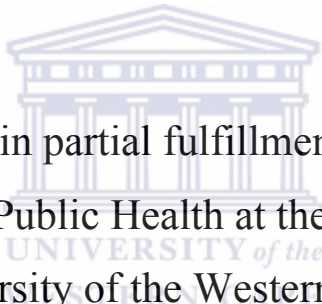# FACTORS INFLUENCING DELAY IN SEEKING TUBERCULOSIS TREATMENT IN BELET-WEYNE DISTRICT, SOMALIA

ABUKAR YUSUF NUR

Student Number: 2438577

A mini-thesis submitted in partial fulfillment of the requirements for the degree of Masters in Public Health at the School of Public Health, University of the Western Cape

Supervisor: Jon Rohde, MD,

Professor of Public Health, School of Public Health, University of the Western Cape

Co-Supervisor: Harry Hausler, MD,

Associate Professor, School of Public Health, University of the Western Cape

December, 2008

TABLE OF CONTENTS

TABLES & CHARTS

Charts

ABBREVIATION

DALY: Disability Adjusted Life Year

CI: Confidence Interval

DOTS: Directly Observed Treatment Short-course

GFATM: Global Fund for Tuberculosis and Malaria

HIV/AIDS: Human Immunodeficiency Virus / Acquired Immunodeficiency Symptoms

 MDR: Multiple drugs resistant

NGOs: Non Governmental Organizations

NRITLD: National Research institute of tuberculosis and lung disease

OR: Odds Ratio

P: Probability

PT: Pulmonary Tuberculosis

RHA: Regional Health Authority

SACB: Somali Aid Coordination Body

TB: Tuberculosis

UWC: University of the Western Cape

WHO: World Health Organization

ACKNOWLEDGEMENT

ABSTRACT

Delays in seeking effective treatment for tuberculosis increase the level of disease morbidity and mortality rate as well as the risk of its transmission in the community (WHO, 2006b). In Somalia, Tuberculosis (TB) remains one of the greatest health threats as it is the leading cause of death in the economically active age groups and in people living with HIV/AIDS (WHO, 2004). This study was carried out with the aim of determining factors influencing delays in seeking TB treatment in Belet-Weyne district.

A cross-sectional study of 132 newly diagnosed smear-positive tuberculosis patients who were within the first two months of their intensive phase of treatment ,was conducted in the Zamzam Directly Observed Treatment (DOT) Centre in Belet-Weyne town, from June 1, 2007 to August 15, 2007. Data was collected using a pre-tested interview guideline with semi-structured questions. Data entry and analysis was done using SPSS 11.5 for Windows and EPI Info 6. Results were compared using chi- square (χ^2) test, Fisher's Exact test, linear regression analysis and multivariate logistic regression analysis.

The study found that 53.8% of the new smear positive pulmonary TB cases in Zamzam TB centre of Belet-Weyne delayed in seeking TB treatment by 60 or more days. The median time interval between the onset of symptoms and treatment initiation was 68.0 days. The study found that the TB patients had average levels of knowledge and perceptions about TB. However, it was also noted that overall knowledge regarding transmission, prevention and recovery among respondents was quite low. Despite the respondents' average knowledge on TB, the study found patients had some misconceptions about the causes of TB, which included the belief that symptoms were the result of a   bad cold, smoking, or being overworked**;** others falsely believed the condition was hereditary, or caused by witchcraft, or the evil eye, or caused from trauma or shaking hands and other forms of physical contact.

This study found that age, distance to treatment centre, level of perception and stigma were associated with delay in seeking TB treatment. However, level of perception and stigmatization were the only factors found to be significantly associated with delay in TB treatment after controlling for confounding factors. Patients that were highly stigmatized were 2.6 times more likely to delay in seeking treatment than those with low stigmatization (p= 0.03; OR = 2.624, CI: 1.101–6.254). Patients with a high perception regarding TB were found to be 0.368 times less likely to delay in seeking treatment than those with a low perception (p= 0.047; OR = 0.368, CI: 0.137– 0.988). Age of patient, stigma scores and distance to the treatment centre were significantly associated with treatment delay when linear regression analyses were conducted. However, they were not significant after controlling for other factors, when logistic regression analysis was performed.

The findings of this study suggest that establishing TB education programs for the public and focusing on reducing stigma will encourage population to seek appropriate medical consultation, improving case detection and subsequently reducing delay of treatment.

Private health practitioners (e.g. traditional healers, pharmacists, etc.) should be trained in handling TB cases, especially in early diagnoses. There is also need for public health facilities to increase accessibility to TB treatment, especially targeting patients with high potential for delay in seeking treatment for the effective control of TB in Belet-Weyne district.

1. INTRODUCTION

1.1 Background

Tuberculosis (TB) is an infectious disease that spreads through the air from person to person. It is caused by Mycobacterium TB. When a person with TB of the lung coughs, sneezes, talks or even sings, the bacteria are sprayed out into the air as infectious droplets. These droplets dry up rapidly but the smallest of the droplets remain suspended in the air for several hours. Not all infected individuals develop TB - approximately 10% develop the disease (Kim, 2002). TB is a major public health concern globally; and is rated second only to HIV/AIDS as a cause of morbidity and adult mortality, accounting for nearly nine million cases of active disease and two million deaths in 2004 (WHO, 2005).

In 1993, the World Health Organization (WHO) declared a state of global emergency for TB due to the steady increase of the disease worldwide. In 1995 Directly Observed Treatment Short-course (DOTS) strategy was established as the key intervention to achieve TB control worldwide. The global targets of this strategy were to achieve 70% case detection and 85% cure rates by 2005 (WHO, 2002). In 2003, DOTS programmes successfully treated 84% of all registered new smear positive patients, but detected only 28% of the estimated tuberculosis cases in the world (WHO, 2002). Early diagnosis and prompt effective therapy form the key elements of the tuberculosis control programme. Delay in diagnosis results in increased infectivity in the community and it is estimated that an untreated smear-positive patient can infect, on average, 10 contacts annually and over 20 during the natural history of the disease until death. (WHO, 2006b). Delay in tuberculosis diagnosis may also lead to a more advanced disease state at presentation, which contributes to late sequelae and overall mortality. Smear-positive cases are more likely to infect other individuals (Styblo, 1991).

Case detection was estimated at 53% globally in 2004 (WHO, 2005). The number of TB cases has, however, been growing in Africa where the TB epidemic is still driven by the spread of HIV. More than 80% of all TB patients live in sub-Saharan Africa and Asia (WHO, 2005). In Somalia, TB remains one of the greatest health threats and is a leading cause of death in the economically active age groups, especially due to the risk of dual HIV/AIDS and TB infection (WHO, 2004). By 2001, Somalia had a high tuberculosis burden with an estimated incidence rate of all forms of tuberculosis of 352/100 000, a smear positive case detection rate of 32% and a close to the target treatment success rate of 83%. With 100% DOTS coverage reached at the end of 2001, the smear positive case detection slightly increased to 37% by 2003 (WHO, 2003, WHO, 2006b).

1.2 Problem Statement

Somalia is among the countries with the highest TB incidences in the world (about 372 per 100,000 populations), with approximately 25,000 expected TB cases per year. The number of estimated smear positive cases is 11,000 per year (162 per 100,000 people) with 80% of the cases occurring in the productive age group of 15-44 years. Tuberculosis is thus a major public health problem in Somalia. As in many other resource-constrained settings, treatment outcomes for TB have not been satisfactory in southern and central Somalia, mainly due to poor treatment compliance, low case detection and low coverage of DOT centers. Barriers such as poverty, lack of knowledge /information, Stigmatization, lack of family support and complexity of the health care system in Somalia could delay seeking care or contacting a health care provider (SACAB, 2003).

In Belet-Weyne District, a community based organization called Zamzam Foundation started a TB program in 2003. Zamzam TB centre is the first specialized TB treatment facility to begin operations in the region after the outbreak of civil war in Somalia in 1990.

The TB centre utilizes the most effective TB treatment strategy, the Directly Observed Treatment Short-course (DOTS) method. Since 2003, WHO has been providing the TB centre with TB medicines free-of-charge. In 2005, the cure rate among the TB patient in Belet-Weyne town was 65% and the defaulter rate decreased from 23.8 % in 2004 to 15.8 % in 2005.

Reports from Zamzam indicate that the percentage of patients coming to the centre with positive smear sputum decreased from 21 % in 2004 to 15 % in 2005 and 12.3% in 2006, while the multi-drug resistance among the defaulters increased from 1.2% to 2.9 % from December'05 to December'06. Clinic data however indicated that nearly half of TB patients had symptoms for two months or more before seeking TB treatment (Zamzam, 2004-2006). Delay in seeking care for TB may be detrimental not only to the individual, whose illness may be more severe, but also to the community, as ongoing transmission will continue until effective chemotherapy is instituted (Meursing, 1997)

There is growing evidence that access to treatment remains difficult for a high number of tuberculosis patients in Somalia. The challenge posed by the low case detection rate in the Belet-Weyne district can be addressed by studying the delay in case finding. Understanding the causes behind the delay in seeking TB treatment is essential for all partners involved in tuberculosis control in Somalia and particularly in Belet-Weyne district, in order to improve the quality and effectiveness of the tuberculosis control programme.

1.3 Purpose

The purpose of this study is to understand the reasons for the delay in seeking TB treatment, in order to effectively modify the Zamzam TB program to reduce the delay. The study will provide evidence for improving policies and programmes that will help enhance early case detection and treatment.

2.0   LITERATURE REVIEW

2.1 Global Epidemiology of TB

TB is one of the major causes of death from a curable infectious disease (WHO, 2004). Findings from results of surveys, surveillance systems and death registrations estimated that 8·9 million new cases of TB were reported in 2004, less than half of which were reported to public-health authorities and WHO. About 3·9 million cases were sputum-smear positive, the most infectious form of the disease. The report further maintains that countries in Africa have the highest estimated incidence rate (356 per 100000 persons per year), but the majority of patients with TB live in the most populous countries of Asia. Bangladesh, China, India, Indonesia, and Pakistan together account for nearly half (48%) of the new cases that arise every year (WHO, 2004). According to Dye (2006), TB is first and foremost a disease of men. Where the transmission of Mycobacterium TB has been rising for many years, the disease is common in young adults with most TB cases are new infections in this case of rising incidence. Reservoirs for high levels of TB transmission rest predominantly in those with undiagnosed pulmonary disease. The contagion parameter suggests that where TB is endemic, each infectious case will result in between 20 and 28 secondary infections (Jochem, 1999). The review by Harries et al, (2001) stated that in many African countries, the time between onset of symptoms and diagnosis of smear-positive pulmonary TB is about 3–4 months, thereby increasing the spread of disease. If detection occurred far closer to the onset of symptoms, secondary cases would automatically fall.

2.2 TB situation in Somalia

The actual scope of the tuberculosis problem in Somalia was first examined in the early fifties, when a tuberculin survey led to an estimation of the annual risk of infection (ARI) at a level of 8% in 1956. Another study conducted in 1986 estimated the ARI to be 3.7% (WHO,

2006 a). In March 2006, WHO carried out a new tuberculin surveys throughout Somalia funded by Global fund for HIV/AIDS, TB and Malaria (GFATM).The surveys revealed that the ARI was at 2.26%. Assuming the Stýblo ratio of 50 new smear positives for each 1% ARI, the incidence of new sputum smear positive was 111/100,000, which assuming a total population of 8.495 million, yields 9430 new cases of smear positive TB and about 11316 smear negative and extra pulmonary (WHO, 2006 a).

In Somalia, TB mostly affects people of reproductive age, with about 56% of notified cases from the age group 15-34 years. It is also noted that men are more affected than women. In Somalia, TB is strongly correlated with poor economic conditions where many patients are refugees or returnees from neighboring countries and many others have lived for more than a decade in war zones. Malnutrition is also common among TB patients and HIV co-infection is rapidly increasing. (SACB, 2003).

The TB Program achieved the regional target of DOTS in all parts of Somalia in 2000, by establishing at least one TB centre in each of the 18 regions. However, the vast regions with the nomadic lifestyle of Somalis contribute to the inaccessibility of these centers. The WHO increased the case detection rate through the expansion of the TB centers In 2006, 11,945 cases were reported in health facilities in Somalia working under DOTS, of which 6,895 were new smear positive cases with DOTS case detection rate of 71 % (WHO, 2006a)

Case detection rates are lower in the North East Zone (34%) than in Central and South Somalia (29% and 63% respectively) where instability and limited number of TB hospitals have affected the provision of services to the population. The treatment success rate was 80% in 2000, with no significant regional differences (SACB, 2003).

2.3 Patient's Delay of TB Treatment

The starting point from which the delays in seeking treatment are measured is uncertain and there is no agreed definition as to what constitutes an acceptable delay. The cutoff point in studies of risk factors for an acceptable delay has been defined in two ways: either a panel of experts agrees on a reasonable period of time or, alternatively, the median delay in observed data is used. Panels of expert have agreed on an acceptable total delay of 30 days [Wandwalo ER, Morkve, 2000, pp-133-138) or 60 days (Pirkis, et al, 1996, pp. 389-390 and Martinho et. al. 2005)

Knowledge and understanding of the delay behaviour is very important for every TB programme as an individual may live with one or more potentially serious symptoms for a month or more and not seek help. This is called delay behavior. Patient delay is defined as the time between when a person first suspects his own symptoms may be of TB and when he actually seeks treatment (Kawathana, 1998). A delayer is likely to be poorly educated and low class in the society (Yusuf, 2004). Older people delay longer than younger people and this situation is common to people with no regular contact with a health provider (Yusuf, 2004).

Study results from rural Ethiopia, indicate that patients' delay was found to average 30 days (Solomon et al, 2005). This is in accordance with other studies conducted in Ghana, by Lawn, S., Afful, B.& Acheampong J (1998), which showed a median patients' delay of 3 – 4 weeks.

A multi-country study from seven countries of the WHO Eastern Mediterranean Region was conducted during 2003–2004 in order to study the extent of delay in the diagnosis and treatment of tuberculosis patients, and its determinants. The results showed that the mean duration of delay between onset of symptoms until treatment with anti-tuberculosis drugs,

ranged from one month and a half to 4 months in the different countries. The mean delay was 46 days in Iraq, 57 in Egypt, 59.2 in Yemen, 79.5 in Somalia, 80.4 in Syrian Arab Republic, 100 in Pakistan, and 127 in Islamic Republic of Iran. The main determinants of delay were: socio-demographic (illiteracy, suburban residence); economic; stigma; time to reach the health facility; seeking care from non-specialized individuals; and visiting more than one health care provider before diagnosis(WHO, 2006b).

2.4 Knowledge and Perceptions of TB

An individual's knowledge, attitudes, and perceptions with respect to health in general and with a specific illness, such as TB influence his/her behavior.

Good general knowledge of TB is important for both health care seeking and adherence to treatment. Studies from Malaysia (Lim et al., 1999).and Vietnam (Xu B et al. 2004) have shown that treatment is often delayed due to poor knowledge, particularly in lower socioeconomic groups. Many in these groups are not aware of the risks associated with long-standing cough, they are not reached by national programmes, and they do not recognize the need for prompt case detection, follow-up and treatment. Weintraub (1975) reported that the significant reason for the increasing prevalence of TB is poor patient compliance with treatment regimens. Although some patients may have sufficient knowledge of their disease or treatment objectives, there is a poor correlation between having such knowledge and adherence to treatment and follow-up. Weintraub concluded that TB control programs that use incentives to improve adherence to a medication regimen or the direct observed therapy method, in which the taking of medication is directly observed have the potential to increase TB cure rates.

A study done in Mankweng in Limpopo province, South Africa among community members, revealed that majority of the respondents perceived the cause of TB as smoking.

7

The perceived cause of cigarette smoking may be associated with TB because many other lung diseases such as emphysema and lung cancer are caused by smoking. Symptoms are the same – cough, phlegm etc. Moreover, smoking reduces appetite among some, but not all and that can cause them to become thin. Similarly, people infected with TB may become thin. This study also mentioned other misconceptions, such as TB being transmitted through dust, dirty air, and chemicals, eating unclean food, using dirty dishes, drinking unclean water and drinking alcohol (Supa & Peltzer, 2005, pp.74-81).

With reference to health care, in the Lusaka urban health centres study, delay was associated with older age, severe underlying illness, poor perception of health services, distance from the clinic and prior attendance at a private clinic. There was no relationship between patient delay and knowledge about tuberculosis or with education, socio-economic level or gender (NRITLD, 2002). Patient delay was also found not significantly associated with patients' socio-demographic characteristics such as age, gender and educational level in a study carried out in Nigeria (Olumuyiwa et al., 2004).

In another study conducted in Kenya, TB was perceived to be contagious, sensitive, and difficult to diagnose and treat. According to the study, community members believe that TB should be diagnosed and treated in a hospital or by a medical doctor and not at the peripheral level. Many participants also believed TB to be hereditary. Prolonged incidences of self-treatment and consultation with the traditional health sector as well as the social stigma attached to the disease increase patients' delay (Liefooghe, et al, 1997). According to a review (Brown, 1999), individual perception of the disease threat is composed of a personal perception of susceptibility to and severity of a certain disease. Personal perception of severity of a disease refers to feeling concerned about the seriousness of contracting an illness as an evaluation of the medical consequences e.g. death, disability and possible social

consequences. When individuals feel that they are at risk of contracting a certain disease, they may or may not act to protect themselves from that situation. This means that the two factors combined, perceived susceptibility and perceived severity of certain diseases bring about the individual psychological readiness to take proposed action (Brown, 1999).

In a study conducted in Ethiopia aimed to determine the length of delay between the onset of symptoms and patient first visit to health care (patient delay) and length of delay between health care visit and diagnosis of tuberculosis, the time before diagnosis in TB patients was long and appeared to be associated with patient inadequate knowledge of TB treatment and distance to the health centre (Madebo T, Lindtjørn B. 1999).

2.5 Stigma and TB

Evidenced both in research and in practice, stigma associated with TB appears to be universal. The consequences of stigma can be seen affecting care-seeking behaviors, as persons have been known to hesitate or choose not to disclose their TB status to family, friends, and co-workers out of fear of being socially ostracized (Auer et al. 2000). TB and HIV are closely linked in people's minds in Lusaka and probably throughout the Southern African region, where as many as two thirds of TB patients may also be infected with HIV. Even patients who have been declared cured from TB are still socially disadvantaged (Meursing, 1997). Other studies have highlighted the silence and discrimination that surround people suffering from HIV and TB, that may deter people from seeking care (Meursing, 1997) and (Liefooghe, 1997). It is possible that those with more severe symptoms may have underlying HIV disease and be less inclined to visit the clinic, fearing stigmatization (Liefooghe, 1997).

9

2.6 Study Aims

Identify factors influencing delay in seeking TB treatment among patients utilizing the TB treatment at Zamzam centre, Belet-Weyne District

2.6.1 Study Objectives

1. To assess delay in seeking TB treatment, from onset of symptoms to initiation of treatment, among patients utilizing the TB treatment centre in Zamzam.

2. To examine the relationship between socio-demographic factors and delay in seeking TB treatment among TB patients.

3. To compare level of knowledge on TB amongst TB patients, who have delayed seeking TB treatment with patients who have not delayed treatment.

4. To compare patient's perceptions related to TB about the susceptibility, severity, benefits, and barriers among the TB patients who have delayed seeking TB treatment with patients who have not delayed treatment

5. To compare accessibility to TB treatment among TB patients who have delayed seeking TB treatment with patients who have not delayed treatment.

3. METHODOLOGY

This chapter presents the methodology adopted to investigate the delays in seeking TB treatment. The chapter describes operational definitions; study area, study population, sampling methods techniques and tools administered for documenting information, reliability and validity, data management and analysis and concludes with ethical aspects of this study.

3.1 Study design

This was a cross-sectional study to investigate factors influencing delays in seeking TB treatment in Belet-Weyne district in Somalia.

3.2 Operational definitions

i) **TB symptoms:** The following symptoms experienced by the patients are considered as TB symptoms in this study:

- Cough for three or more weeks

- Recurring fever in the evening and night

- Chest pain

- Weight loss

- Haemoptysis (coughing of blood stained sputum)

Any one of these symptoms was taken into consideration for estimating the date of onset of symptoms for study subjects (new smear positive pulmonary TB cases)

ii) **Delay for Pulmonary TB treatment**: This is the time between onset of symptoms and initiation of pulmonary TB treatment. This study has defined a delay of two months in seeking treatment as excessive, as no scientifically agreed criteria could be found in the

literature upon which to base a definition of delay. This definition was chosen only after having seen the distribution of delay times in our clinic patients.

iii) ***Knowledge of TB***: It is the understanding about the disease by research subjects. It was assessed by asking a few fundamental questions about cause, important symptoms, mode of transmission, diagnosis, and treatment of TB.

iv) ***Perception related to TB***: This is the patient's recognition and interpretation of his feelings or emotions based on past experiences. It is the perception made by the study subjects, and was assessed by asking study subjects to respond to some fundamental statements about perceived susceptibility, perceived severity and perceived benefits of TB.

v) ***Perceived Severity***: Refers to the degree of seriousness and limitation imposed on life style, which an individual perceives.

vi) ***Perceived treatment benefits***: Refers to the degree to which an individual perceives his/her medication to be effective in controlling and preventing adverse consequences.

vii) ***Perceived barriers***: Refers to the degree to which an individual perceives there are barriers associated with use of the TB drug s for long period and unpleasantness, quality of hospital services in terms of health care provider manner.

viii) ***Type of the first contact health care provider/worker***: It is the type of health care provider consulted by the study subjects (TB patients) in the course of health care seeking for treatment of TB.

ix) ***Accessibility (distance):*** It is the distance from the original residence /home of the study subjects to the current DOTS centre. It will be measured by asking study subjects about the Distance in KM taken from home to the treatment centre for the first time when they started the TB treatment.

3.3 Study area

The study has covered the Belet-Weyne town in the Belet-Weyne district. There are two DOTS centers managed by local NGOs, with support from WHO. The study covered one of the DOTs centre named Zamzam clinic. The clinic was purposively selected due to ease in access and familiarity by the researcher.

Study population

All the new smear positive pulmonary TB patients registered in the Zamzam TB Treatment centre in Belet - Weyne district during their first two months of intensive phase of treatment were considered as the study population. This was matched with the exclusion criteria (see exclusion criteria below 3.9).

3.4 Sampling and Sample size

A cross-sectional survey was conducted among the study population, who were within the first two months of their intensive phase of treatment under DOTS. For this study, all subjects registered within the period of June 1, 2007 and August 15, 2007 in the Zamzam DOT centre in Belet-Weyne district were included. There were 157 new cases of smear positive pulmonary TB found registered in the centre in the study period. Out of this, only 132 cases were accessed for information in this study. Among the rest, 4 cases were transferred out, 5 defaulted, 2 died, 3 refused and 11 were excluded because they were below 15 years of age.

The sample size planned was calculated using a 2 tailed test. The sample size was determined by the use of a previous descriptive comparative cross-sectional study done in Thailand (Yusuf, 2004): which has shown that 50% of TB patients who delay in seeking treatment

have adequate knowledge on TB as compared to 34% of TB patients who do not delay in seeking treatment have adequate knowledge.

Primary outcome variable = in this study, the outcome of interest used for sample size determination was 'overall level of knowledge on Tuberculosis'.

The following formula for the sample size for comparison of 2 proportions (two-sided) was applied: -

$$n = [A + B]^2 * [(p_1*(1-p_1)) + (p_2 * (1-p_2))]/[p_1-p_2]^2$$

where n = the sample size required in each group.

p_1 = first proportion with adequate knowledge for patients delayed (= 0.50)

p_2 = second proportion with adequate knowledge for patients not delayed (= 0.34)

p_1-p_2 = required size of difference (= 0.16)

A = standard normal deviate for desired 95% significance level (= 1.96)

B = Is the table value for the desired 80% power (= 0.84)

Substituting the values in the above formula, the sample size per group is:

$$n = [1.96 + 0.84]^2 * [(0.50*0.50) + (0.34* 0.66)] / [0.16]^2 = 146$$

Therefore, the total the number of patients required in each group is 146. Given that the total number of TB patients in the study area was less than the determined sample size, all patients that satisfied the inclusion criteria were recruited in the study.

.Inclusion criteria

New smear positive Pulmonary TB patients above 15 years of age, during their first two months of intensive phase of treatment were included in the study. This was done to minimize recall bias of patients and access more patients.

Exclusion criteria

The study excluded the research subjects based on the following conditions:

- Patients below the age of 15 years at the date treatment started. This was confirmed by looking at the TB registers at the DOTS centre and patients' treatment cards before the interview.

- Patients who defaulted before the date of data collection.

- Smear negatives and relapsed or failed treatment were excluded from the study. This was based on the fact that if a patient is sputum negative, he/she may not have TB at all.

- Patients with other complications together with TB e.g. heart disease, renal diseases or patients unwilling to participate in the study were excluded.

3.5 Data collection Methods

Before interviewing the patients, the numbers of eligible study subjects in the treatment centres were recorded by reviewing the TB registered at the clinic. With the permission of health workers at the DOTS clinic, patients coming to the centers for their treatment under DOTS were requested for consent and then interviewed for the required information. Information like date treatment started was recorded from the TB registers and TB treatment cards. To assure confidentiality, no permanent record of the study patients' names and other information were made and patients were asked to participate in the study voluntarily. Data collected was used only for the purposes of the study and all information obtained during interviews was treated confidentially. Careful attention was paid to maintain the patient's comfort during the interview. It took approximately 35 to 45 minutes for a single interview.

Pre-tested anonymous interview guidelines in the form of semi-structured questionnaire in Somali language were introduced to the study subjects by well-trained research assistants to

collect the information required. (Annex 3). There were two research assistants and the researcher participated in this study for information documentation. (Annex 1). Study subjects were asked TB treatment seeking history and their understanding about the disease, perception, stigma and some socio-economic issues such as family income, level of education, gender, resident status etc.

3.6 Validity and Reliability

A two days training of enumerators was conducted covering interview techniques, sampling procedure inclusion and exclusion criteria, identification of date of onset of symptoms of TB and the general courtesy during the study.

The tools were pre-tested in one of the facilities offering DOTS services not selected for the main study prior to the start of study, with modifications incorporated in the final version. During piloting, the questionnaires were independently pre-tested using 5 volunteer patients by two different enumerators to assess their validity. After the pre-testing, views were exchanged to address the difficulties identified, appropriateness of the questions reviewed and appropriate changes made. Quality of data collection was given first priority throughout the study period. This included: close monitoring of patients, interviews by supervisors, cross-checking of completed questionnaires on daily basis, and daily reviews conducted with the survey teams to address any difficulties encountered. To ensure the external validity of the study was maintained, relevant literature was reviewed and opinions from the experts in the concerned field of TB research were obtained.

3.7 Data management and analysis

Data was entered into a database created using SPSS 11.5 for Windows. A preliminary analysis was done to facilitate coding of open-ended questions and recoding of variables

where necessary. Analysis was done using SPSS 11.5 for Windows. Data were analysed to compare the different risk factors among the TB patients who had delayed in seeking treatment with those who had not delayed in seeking TB treatment, as well as assess knowledge and perceptions related to TB. A 60 days cut-off on patients' delay was used to estimate the time between onset of symptoms and initiation of treatment and to identify the risk factors associated with the delay in patients with TB. This 60 days cut off period was used to dichotomize the sample to either shorter or longer delay periods.

The results are presented in form of tables and charts/diagrams. Descriptive statistics were determined during data analyses. The Chi-square (χ^2) test, Fisher's Exact test, and Logistic regression analysis were carried out. Logistic regression analysis was done in order to determine the effect of each of the considered variables on the outcome variable (i.e. delay in seeking TB treatment) independent of the others.

In addition, linear regression analysis was performed to relate age, income and distance with TB treatment delay (taken as a continuous variable).

The 5% significance level was used in all the statistical tests of significance conducted.

3.8 Scoring and classification criteria

Knowledge about TB was measured by scoring method. The correct answers were given a score of one (1) and an incorrect answer is given a score of zero (0) out of a total of 29. The level of knowledge was ranked into 'good knowledge', 'average knowledge' and 'poor knowledge' depending on the number of correct answers each patient gave out of the total questions. Thus, a composite variable was then produced and categorized as $\geq 80\%$ (good knowledge), $50 - 79\%$ (average knowledge) and $< 50\%$ (poor knowledge). Perception was rated as: 1 = Agree, 2= Uncertain, 3= Disagree. Thus, a composite variable was produced and

17

similarly categorized as ≥ 80% (good perception), 50 – 79% (average perception), and < 50% (wrong perception). Patients were also asked to respond on seven stigma-related statements contextual in the local socio-economic perspectives to assess their level of stigma, and categorized into 'highly stigmatized', 'average stigmatized' and 'less stigmatized' rankings.

3.9 Ethical consideration

An informed consent form was given and completed by each research subject before data collection. Prior to this, an information sheet comprising of the purpose of the study, potential risks and benefits of participating in the exercise, procedure of maintaining confidentiality, and right not to participate in the study were provided to the research subjects (Annex 5). The ethical approval was obtained from the Higher Degree Committee of University of Western Cape of South Africa, followed by Regional Health Authority (RHA), and management of Zamzam TB centre.

3.10 Biases and limitations

A selection bias could have been introduced in this study, as the study sample could not include those TB patients who were receiving their treatment entirely in the private sector. The private clinics were not using Direct Observed Treatment method with poor monitoring. The study focused on WHO supported centre where TB treatment services are free, hence the private sectors may not be represented. Therefore, the findings of this study need to be interpreted with caution. Another possible bias could have been recall bias among the subjects interviewed. However, every possible effort was made during the interview to minimize the recall bias, and also the patients included were in the intensive phase of their regular treatment under DOTS, mostly within the first one month. Also, another potential bias could be the definition of the cut-off values of delay chosen by the researcher, which is very much contextual. This bias however, should be minimal, since the cut-off values for defining

delay was taken after relevant literature were reviewed, and adequate discussion with the experts in field of TB care were made. Apart from using 60 days as a cut-off point, similar analyses with different cut offs of 45 days, 75 days and 120 days were run in order to see if there could be any differences arising from recall bias.

UNIVERSITY *of the*
WESTERN CAPE

4.0 FINDINGS

4.1 Introduction

This chapter presents the findings of the investigations of factors influencing delay in seeking TB treatment in Belet-Weyne district. The findings include socio-demographic factors of the study population, duration of treatment delay, knowledge and perceptions of TB patients and the level of stigma. Comparative analysis was done to describe the association of delay in seeking TB treatment with socio-demographic factors, knowledge and perception of disease, stigma and type of the first contact and the physical accessibility of the treatment centre.

4.2 Socio –Demographic Characteristics

Out of a total of 132 patients interviewed, 78 (51.9%) were males while the remaining 54 (40.9) were females. A total of 62 (48%) of the respondents were married while 40 (30%) were single. The remaining 30 (28%) patients were widowed, separated or divorced. About three quarters (74%) of the respondents earned 50 USD or less per month. Overall, 43.9% of the respondents earned 30 USD or less per month, and 5% earned more than a 100 USD per month.

The main source of income was subsistence farming for which 56% of the respondents were involved. Slightly over a half (57.6%) of the respondents were illiterate while only 4.5% had attained secondary level of education. The study also found that about two-fifths (41.7%) of the respondents were young patients in the age bracket of 15 – 34 years. The oldest respondent was 84 and youngest was 15 years.

Table 1: The socio-demographic characteristics of the study population.

Characteristic	Number	Percentage
Gender		
Male	78	59.1
Female	54	40.9
Total	132	100.0
Age (years)		
15-34	55	41.7
35-54	41	31.1
≥55	36	27.2
Total	132	100.0
Residential status		
Resident	91	68.9
IDPs	6	4.5
Internal migrant	33	25.0
Returnees	2	1.6
Total	132	100.0
Marital status		
Married	62	47.0
Single	40	30.3
Widowed	21	15.9
Separated	1	0.8
Divorced	8	6.1
Total	132	100.1
Educational level		
Illiterate	76	57.6
Literate/Primary (1-5)	20	15.2
Lower secondary (6-8)	30	22.7
Secondary (9-10)	6	4.5
Total	132	100.0
Occupation		
Skilled worker	34	25.8
Unskilled worker	17	12.9
Subsistence farmer	14	56.1
Unemployed	7	5.3
Total	132	100.1
Monthly income(US dollar		
>$30 /Month	74	56.1
<$30/month	58	43.9
Total	132	100.0

4.3 Distribution of delay

The study found that about half 53.8 % (CI: 44.9-62.5) of the new smear positive pulmonary TB cases in the Belet-Weyne town delayed by 60 or more days in seeking for TB treatment. The median time interval between onset of symptoms and initiation of treatment among the study population was 68.0 days with a mean 112.5, within a range of 7- 469 days having a standard deviation of 110. 96 days. Thirty-five percent of the subjects delayed in seeking TB treatment for a period of over 120 days (see chart 1).
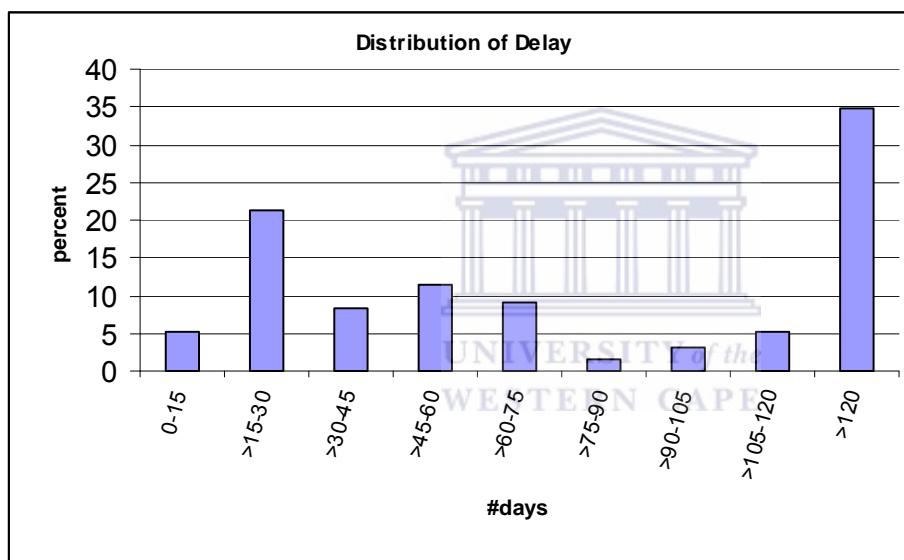
Chart 1: Distribution of Delay in Seeking for TB Treatment

4.4 Knowledge and TB

Knowledge about TB was assessed by reviewing some fundamental statements about cause, important signs and symptoms, mode of transmission, diagnosis, prevention and recovery from TB infection. The level of knowledge was graded into 'good knowledge', 'average knowledge' and 'poor knowledge' depending on the number of questions the patients answered correctly from a set of 29 questions.

As shown in Table 2, most of the respondents were not aware of the causes of TB. Majority of patients (82.6 %) believed that TB is caused by bad cold, hard work and trauma (78.8%), smoking (67.9 %), heredity (68.9%) and witchcraft and evil eye (49.2%). Only 41.7% of the patients however had knowledge about the TB infection causing micro-organism.

Over 90% of patients (95.5%) also thought that coughing for three weeks or more was a symptom of TB. An almost similar proportion of patients (93.2%) believed that fever in the evening and night was a symptom of TB, while chest pain (90.2%) and blood while coughing (86.4 %) were also cited as major symptoms TB. A relatively small percentage (41.7**%)** thought that headache is a sign of TB.

However, most of the patients (71.2%), understood that TB is transmitted mainly through air droplets resulting from coughing by a TB patient and sharing common utensils/food (64.4%) while 71.2% believed that TB is transmitted through shaking hands. Majority (97.7%) of the patients had said that TB can be diagnosed by sputum examination followed by chest x-ray (82.6%) and recognizing signs (62.9%), while the remainder had no knowledge about the causes.

Most of the patients did not know about the correct prevention of TB. Only (44.7 %) knew that covering the nose/mouth when coughing and sneezing is important for prevention, while 37.1% mentioned vaccination as a method of TB prevention.

Three-quarters of the subjects believed that TB can be cured through medication, 61.4% through traditional healing, while 39.4% of patients still believe that TB cannot be cured.

Table 2: Knowledge on TB

Item	Knowledge %	
	Yes*	No
Causes of TB		
Smoking and alcohol	30.3	69.7
Germs/micro-organisms	41.7	58.3
Hard work or trauma	21.2	78.8
Witchcraft/evil eye	50.8	49.2
Cold	17.4	82.6
Hereditary disease	31.1	68.9
Sign and symptoms		
Coughing more than three weeks	95.5	4.5
Fever in the evening and night	93.2	6.8
Chest pain	90.2	9.8
Cough with blood	86.4	13.6
Headache	41.7	58.3
Transmission		
Coughing by TB patient	71.2	28.8
Sharing utensils/food	67.4	32.6
Hand shakes	28.8	71.2
Diagnosis		
Blood examination	32.6	67.4
Recognizing signs and symptoms	62.9	37.1
Positive sputum	97.7	2.3
Chest X-ray	82.6	17.4
General body examination	54.5	45.5
Stool and Urine examination	47.0	53.0
Prevention		
Vaccination	37.1	62.9
Covering nose/mouth when coughing and sneezing	44.7	55.3
Avoid staying in crowded place	59.1	40.9
Avoid being air conditioning room with smoke	43.2	56.8
Recovery		
Curable through medication	75.8	24.2
Self recovery	57.6	42.4
Praying to God	91.7	8.3
Traditional healing	38.6	61.4
Cannot be cured	60.6	39.4
Correct answer = Yes		

On overall assessment of level of knowledge regarding TB, the study found that majority of

respondents (72.2 %) had an average level of knowledge on TB, while (23.3%) of them had

above average/good level of knowledge and only 4.5 % had poor knowledge. Slightly more

than half (55.3 %) of the respondents had poor knowledge on causes of TB, while 15.2% of

them had good knowledge. Knowledge of signs and symptoms was at a good level (83.3%)

24

across all the respondents. Knowledge of diagnosis was average at 68.9% while knowledge of transmission, prevention and recovery were averagely scored.
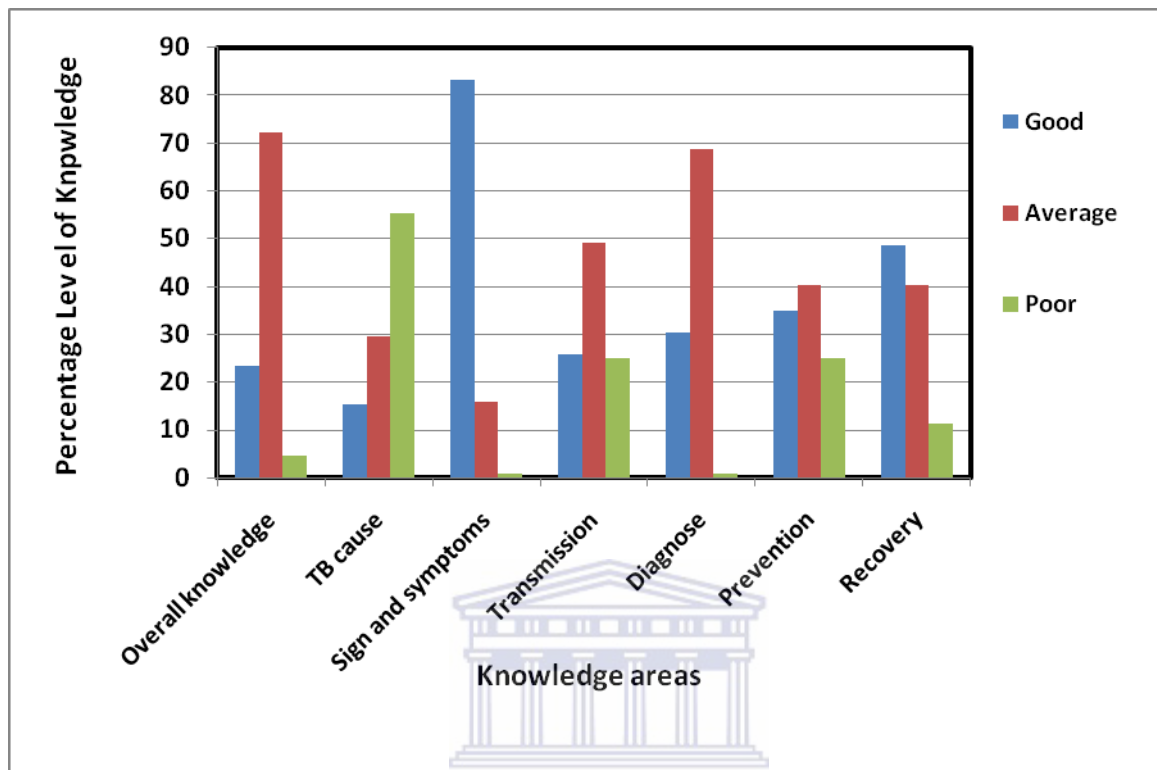
Chart 2: Knowledge of TB summary

4.5 Perceptions

Level of perception (attitudes and beliefs about TB) was assessed by asking patients to respond to fundamental statements about perceived susceptibility, perceived severity, perceived treatment benefit and perceived barriers of TB health care. It was ranked into 'good perception', 'average perception', and 'wrong/poor perception'. Majority of the respondents (62.9%) perceived close contact with TB patients as a mode of TB transmission. More than half (58.3%) perceived that sharing food with TB patients might facilitate getting TB transmission, while 49.2% of the respondents perceived that living in crowded environment can easily transmit TB. 46.2% believed that living with a TB patient makes people vulnerable to TB infection. On perceived severity, three quarters (75.8%) of respondents agreed that TB is serious illness, while the rest were uncertain. Regarding the perceived benefits of TB

treatment, over 50% of the respondents perceived TB medication as effective in controlling and preventing adverse consequences. More than half (56.8%) of the respondents agreed that TB patients hardly got involved in social activities. About 63% of the respondents said that TB affects performance of their daily activities. On perceived barriers to accessing TB treatment nearly half (45.5%) of the respondents agreed that there were barriers affecting access to TB treatment as illustrated in table 3.

Table 3: Perception of 132 TB patients by items

Item	Level of perception (%)		
	Agree	Uncertain	Disagree
Perceived susceptibility			
Close contact with TB patients	62.9	21.2	15.9
Sharing food with TB patient	58.3	17.4	24.2
Living in crowded environment	49.2	22.7	28.0
Sharing living quarters with TB patients	46.2	25.0	28.8
Perceived severity			
TB is a serious illness	75.8	13.6	10.6
Lack/Minimised social life	56.8	28.8	14.4
TB can't be cured	31.8	22.0	31.8
Tb is not serious ,you can go on working anyhow	22.7	34.8	42.4
TB affects working	63.6	25.0	11.4
Perceived benefits			
Anti-TB drug can stop the transmission	50.8	36.4	12.9
Anti-TB drug can decrease death rate	47.7	27.3	25.0
Poor or rich TB patients have equal chance to treatment	39.4	28.8	31.8
TB patients who completed their treatment can live happily	52.3	31.1	16.7
Perceived Barriers			
It is difficult to take anti-TB drugs	20.5	36.4	43.2
Access to TB drugs from hospital difficult	45.5	34.1	20.5
Time is wasted undergoing treatment with anti-TB drug	25.0	43.2	31.8
It is expensive to get TB treatment	22.0	39.4	38.6

Table 4: Summary of Perception

Perception	Level of perception (%)		
	Good	**Average**	**Poor**
Over all perception	44.7	54.5	0.8
1. Perceived susceptibility	52.3	39.4	8.3
2. Perceived severity	64.4	28.0	7.6
3. Perceived benefit	40.2	53.8	6.1
4. Perceived .barriers	28.8	64.4	6.8

4.6 Stigma

Patients were asked to respond on seven stigma-related statements contextual in the local socioeconomic perspective, to assess the level of stigma, and categorized into 'highly stigmatized', 'averagely stigmatized' and 'less stigmatized'. As shown in table 5, the study found that slightly over one-third (37.1 %) of respondents would stay away from their neighbours and friends when they were infected TB for the first time. Approximately 41% of them held the belief that people would be isolated when they got TB, whereas the rest of the respondents were not sure how the community would react on learning they had TB infection. Almost two-thirds (63.6%) of respondents said that they were not viewed the same way within their family or community after getting TB. About two-thirds (68.9 %) of the respondents held the belief that it would be difficult for an unmarried woman to find a suitor if she got TB, whereas 31% of them did not believe this was so. The statement "TB is the disease of the poor" yielded a 'yes' response from 41.7% and 'no' or "not sure" by 58.4%. Almost half (48.5%) of the respondents however believed that TB is the punishment for sinful acts committed in life (Table 5).

Table 5: Stigma among TB patients

Item	Level of Stigma (%)		
	Yes	Not sure	No
Preferred to be isolated on first contracting TB	37.1	28.0	34.8
People would become lonely when they got TB	40.9	29.5	29.9
TB patient are treated normally in family	25.8	10.6	63.6
TB patient are treated normally in the neighborhood	36.4	21.2	42.4
It is difficult for women to get married if they have TB.	68.9	18.9	12.1
TB is the disease of the poor	41.7	32.6	25.8
TB is a punishment for sinful act committed in life	48.5	22.7	28.8

The study also established that 53.8% of the respondents were highly stigmatized as illustrated in the chart 3 below.
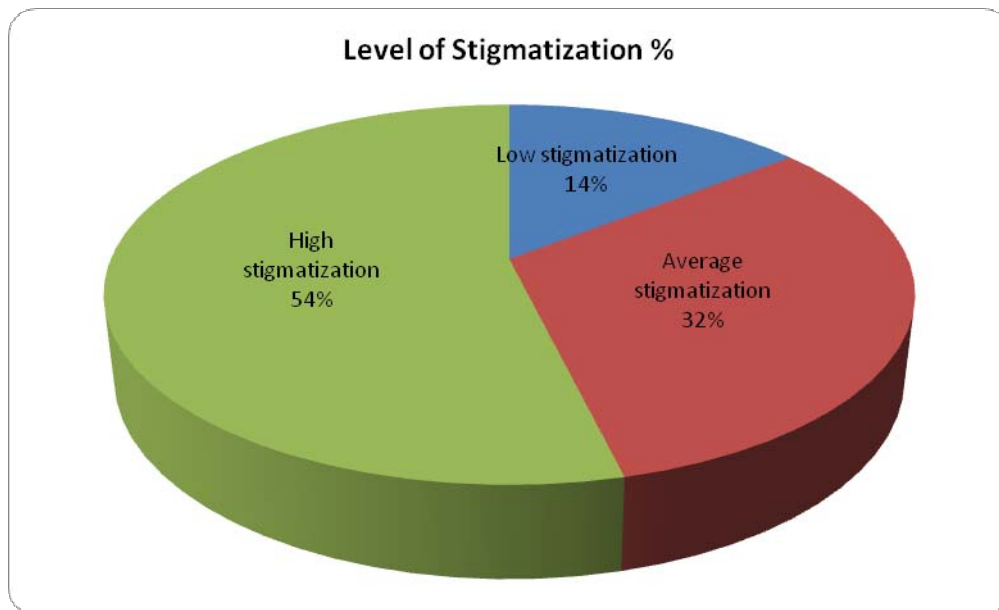
Chart 3: Level of Stigmatization

4.6 Types of the first contact with a health care provider

Patients were asked to do a history recall indicating their first point of contact with a health care provider, on onset of TB symptoms. Thirty-five percent of TB patients first consulted traditional healers on learning they had TB while the remaining visited drug shops/pharmacies (23.5%), private clinics (20.5%), TB clinics (18.6%) and village health workers (2.3%).

4.7 Accessibility to the treatment centre

Patients' accessibility from their original homes to current treatment centre was assessed in terms of distance in kilometers (km). About two-fifths (43.2%) of the respondents traveled less than 5 kilometers while 31.8 % traveled between 5 to 10 kilometers. The remaining 25% traveled more than 10 kilometers to reach the treatment centre as illustrated in chart 4 below.
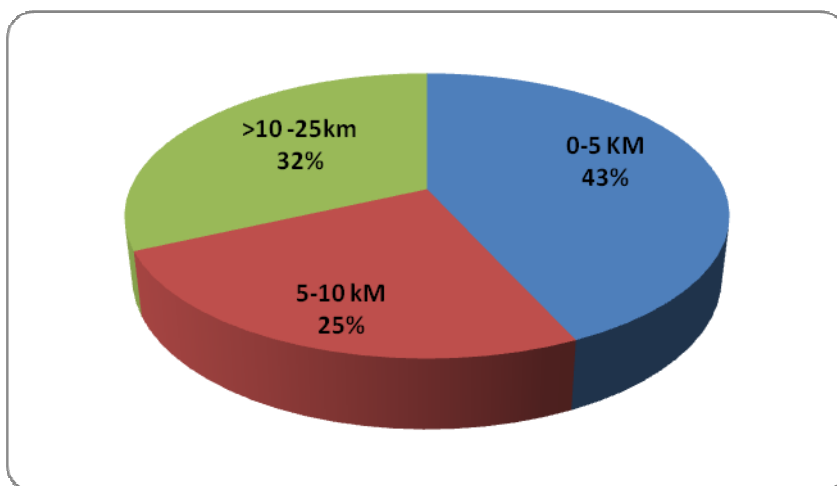
Chart 4: Distance to treatment centre

4.8 Relationships of factors to delay in seeking treatment

The relationships between various factors and delay in seeking TB treatment among TB patients were assessed. This section is in two parts. The first part relates independent variables with categorized duration of TB treatment delay (i.e. delayed versus not delayed) while the second part presents results of linear regression analyses when age, income and distance were each regressed against duration of treatment delay (taken as a continuous variable).

4.8.1 Part 1: Relationships

4.8.1.1 Socio –Demographic Characteristics versus delay

The study established that the proportions of delay in TB treatment among male and female TB patients were equal (53.8% versus 53.7%, respectively), implying no significant difference ($p=0.987$). The other socio-demographic characteristics which were found not to have any significant influence on delay in seeking TB treatment included marital status, occupation and residential status. The study established that there was a statistically significant relationship between age, level of education and delay in seeking TB treatment. Older patients significantly delayed in seeking TB more than younger patients ($p<0.05$).

Those patients aged 35 – 54 years were 1.9 times more likely to delay in seeking TB treatment than those aged less than 35 years. Similarly, patients aged 55 years and above were about 3.9 times more likely to delay in seeking treatment than those aged less than 35 years. TB patients with no formal school education were about two times more likely to delay in seeking treatment than those with formal school education (Odds ratio = 2.16).Patients in lower income brackets were likely to delay by over two or more months. About two-fifths (43.9%) of the respondents earned 30 USD or less per month. They had a significantly higher delay rate when compared with the respondents who made more than 30 USD (63.8% versus 45.9%). The difference was found to be statistically significant ($p=$ 0.0412).

Table 6: Socio – Demographic Characteristics versus delay

			Delay in seeking TB treatment		Test statistic (X^2)	p-value
			Delayed	Not delayed		
Gender	1.	Male	42(53.8)	36(46.2)	0.000	P=0.987
	2.	Female	29(53.7)	25(46.3)		
Age (years)	1.	15-34	22(40.0)	33(60.0)	9.21	P=0.01
	2.	35-54	23(56.1)	18(43.9)		
	3.	≥55	26(72.2)	10(27.8)		
Residential status	1.	Resident	49(53.8)	42(46.2)	2.74	0.4341
	2.	Internal migrant	18(54.5)	15(45.5)		
	3.	IDPs/Returnees	4(50.0)	4(50.0)		
Marital status	1.	Married	35(56.5)	27(43.5)	3.44	p=0.94
	2.	Single	19(47.5)	21(52.5)		
	3.	Widowed	11(52.4)	10(47.6)		
	4.	Separated/Divorced	6(66.7)	3(33.3)		
Educational level	1.	Illiterate	47(61.8)	29(38.2)	4.675	0.025<p<0.05
	2.	Literate/Primary (1-5)	24(42.9)	32(57.1)		
Occupation	1.	Skilled worker	16(47.1)	18(52.9)	3.50	0.3211
	2.	Unskilled/unemployed	12(57.1)	9(42.9)		
	3.	Subsistence farmer	40(54.1)	34(45.9)		
Monthly income (USD)	1.	>30 /Month	34(45.9)	40(54.1)	4.17	0.0412]
	2.	< 30/month	37(63.8)	21(36.2)		

Note: Values in the parenthesis indicate percent computed row wise

4.8.1.2 Knowledge and delay

The results for the relationships between knowledge and delay in seeking T.B treatment among the study subjects are presented in Table 7. The study established that there was no

statistically significant relationship between overall level of knowledge on TB and patient's delay (*P*>0.05). Further analysis by each aspect of knowledge also found no statistically significant association with patient's delay (*P*>0.05). However, the proportion of patients who delayed in seeking TB treatment among those with less knowledge about the causes of TB was higher than that among those with high knowledge on causes of TB (57.8% versus 40.0%). Similarly, it was also found that 55.7% of the respondents with high knowledge on TB transmissions had delayed seeking TB treatment as compared to 50% among the patients with low knowledge on TB transmission. The respondents with low knowledge on TB prevention had delayed more than those with high knowledge of TB prevention. However, the proportion of delay in seeking TB treatment among patients with high knowledge of TB diagnosis was slightly higher than that among patients with low knowledge level about TB diagnosis, but none of the associations was found to be statistically significant

Table 7: Association between knowledge and delay of TB patients (n=132)

	Delay in seeking TB treatment		X^2	P-value
	Delayed (%)	**Not delayed (%)**		
Overall knowledge				
High	43(55.8)	34(44.2)	0.314	0.575
Low	28(50.9)	27(49.1)		
Cause of TB				
High	12(40.0)	18(60.0)	2.97	0.084
Low	59(57.8)	43(42.2)		
Sign and symptoms				0.301 (using Fisher's exact test)
High	68(55.3)	55(44.7)		
Low	3(33.3)	6(66.7)		
Transmissions				
High	49(55.7)	39(44.3)	0.38	0.5370
Low	22(50.0)	22(50.0)		
Diagnosis				
High	36(54.5)	30(45.5)	0.030	0.861
Low	35(53.0)	31(47.0)		
Prevention				
High	22(47.8)	24(52.2)	1.010	0.315
Low	49(57.0)	37(43.0)		
Recovery				
High	51(55.4)	41(44.6)	0.33	0.564
Low	20(50.0)	20(50.0)		

Note: *Values in the parenthesis indicate percent computed row wise*

4.8.1.3 Perception and Delay

The proportion of the study population who delayed in seeking TB treatment among patients with overall low perception about TB was higher than that among patients with high perception (60.3% versus 45.8%). However, the difference was not statistically significant ($p=0.096$).

Delay in seeking TB treatment was found to be higher among those with high perception of TB severity as well as those with low perception of barriers to treatment accessibility (Table 8). On perceived susceptibility, the proportion of patients who delayed in seeking TB treatment was the same for those patients with high and those with low perception (53.6% versus 53.9%).

Table 8: Association between Perception and delay of TB patients (n=132)

	Delay in seeking TB treatment		χ2 test	P-value
	Delayed (%)	Not delayed (%)		
Overall perception				
High	27(45.8)	32(54.2)	2.764	0.096
Low	44(60.3)	29(39.7)		
Perceived Susceptibility				
High	37(53.6)	32(46.4)	0.02	0.8925
Low	34(53.9)	29(46.1)		
Perceived Severity				
High	49(57.6)	36(42.4)	1.43	0.231
Low	22(46.8)	25(53.2)		
Perceived Benefits				
High	33(50.8)	32(49.2)	0.47	0.4932
Low	38(56.7)	29(43.3)		
Perceived Barriers				
High	22(57.9)	16(42.1)	0.36	0.547
Low	49(52.1)	45(47.9)		

Note: *Values in the parenthesis indicate percent calculated row wise*

4.8.1.4 Stigma and delay

As shown in table 9, 59% of TB patients who were highly stigmatized, delayed in seeking TB treatment for more than 60 days since the onset of TB symptoms, while 35.2 % of lowly stigmatized patients delayed in seeking TB treatment. The difference was found to be

statistically significant (*P=0.0062*). Those who were highly stigmatized were 2.7 times more likely to delay in seeking TB treatment than those with low stigmatization.

Table 9: Association between Stigma and delay of TB patients (n=132)

Variable	Delay in seeking TB Treatment		χ2 test	Odds ratio	P-value
	Delayed	Not delayed			
Highly stigmatized (n=61)	36(59..0)	25(41.0)	7.48	2.65 (CI:1.23 - 5.76)	0.0062
low stigmatized (n=71)	25(35.2)	46(64.8)			

Note: *Values in the parenthesis indicate percent calculated row wise*

4.8.1.5 Types of the First Contact Health Care Provider and Delay of TB Patients

Table 9 illustrates the relationship between types of the first contact health care provider and delay in seeking TB treatment. All the three patients that were first in contact with the village health worker delayed in seeking TB treatment. About 80% of patients that were first in contact with Traditional healer delayed in seeking treatment. The patients that had the least delay in seeking TB treatment was observed among patients who were in contact with the TB clinic (16.7%) followed by private clinic (29.6%). Overall, there was a statistically significant association between the type of the first contact health care provider and delay in TB treatment (χ2=34.68, *P*= 0.00005).

Table 10: Types of the first contact health care provider and delay of TB patients

Variable	Delay in seeking TB Treatment		χ2 test [2]	P-value
	Delayed	Not delayed		
First contact after onset of signs				
Drug shops/pharmacies	19(61.3)	12(38.7)	34.68	<0.00005
Private clinic	8(29.6)	19(70.4)		
Village health worker	3(100.0)	0(0)		
Traditional healer	37(78.7)	10(21.3)		
TB clinic	4 (16.7)	20(83.3)		

Note: Values in the parenthesis indicate percent computed row wise

4.8.1.6 Distance to Treatment Centre versus Treatment Delay

As shown in table 9, distance to the treatment centre was statistically significantly associated with patient delay ($\chi 2$=8.51, P=0.0142). The proportion of patients who delayed in seeking treatment was highest among patients who had to travel for a distance of 10 or more kilometers, followed by those who had to travel 0 - 5 Km., and least by those 5 − 10 km. away. From linear regression analysis, delay tended to increase with an increase with distance to treatment centre (*p*=0.024) (Table 11)

Table 11: Distance to Treatment Centre versus Treatment Delay.

Variable	Freq	Delay in seeking TB Treatment		$\chi 2$ test [2]	P-value
		Delayed	Not delayed		
Distance					
0-5 km	57	28(49.1)	29(50.9)	8.51;	0.0142
5-10 km	33	13(39.4)	20(60.6)		
>10 -25km	42	30(71.4)	12(28.6)		

Note: Values in the parenthesis indicate percent computed row wise

4.8.1.7 Results of Logistic Regression Analysis

The results presented are from analysis conducted using a cut-off period of 60 days. Further analyses were also carried out using cut-offs of 45 days, 75 days and 120 days

The following independent variables were selected for further analysis by logistic regression analysis because of either having been associated with delay in seeking TB treatment during the cross-tabulations or because of their importance in the relationships being sought: age, monthly income (in US$), type of first contact with the health care provider, overall level of knowledge on T.B, overall perception on T.B, distance to TB treatment centre, level of education and stigmatization.

Level of perception and stigmatization were the only independent variables found to be statistically significantly associated with delay in TB treatment after controlling for other

variables in the model when 60 days was used as a cutoff point (Table 11). Those patients with low perception were 2.7 times more likely to delay in seeking TB treatment than those with high perception. Patients highly stigmatized were about 2.6 times more likely to delay in seeking treatment than those with low stigmatization. The remaining variables, namely, age, monthly income (in US$), type of first contact with the health care provider, overall level of knowledge on T.B, distance to TB treatment centre, and level of education were found not to be statistically significantly associated with TB treatment delay. However, when the cut off point was changed from 60 days to 45 days, 75 days or 120 days, it turned out that level of stigmatization was the only factor that had a significant effect on patient delay when other factors were controlled for. The results for these further analyses are presented in annexes 7-11. The measure of strength of association (i.e. odds ratio) was lowest at 45 days' cutoff point (OR = 2.5) and 60 days' cutoff point (OR = 2.6) and highest at cutoff point of 75 days (3.268). The odds ratio for cutoff point of 120 days was 2.721.

Table 11:   **Results of Logistic regression analysis**.

Variable	B	S.E.	Wald's statistic (χ^2)	df	p-value	Odds ratio	95.0% C.I for odds ratio	
							Lower	Upper
Age (groups)	.475	.251	3.592	1	.058	1.608	.984	2.628
Monthly income	.110	.364	.092	1	.762	1.117	.547	2.279
Level of education	-.156	.233	.446	1	.504	.856	.542	1.352
Level of stigma	.965	.443	4.736	1	.030	2.624	1.101	6.254
Type of first contact	-.041	.130	.101	1	.751	.959	.743	1.239
Distance (KM)	.333	.231	2.085	1	.149	1.396	.888	2.195
Overall knowledge of TB	.460	.554	.691	1	.406	1.585	.535	4.689
Overall perception of TB	-1.000	.504	3.937	1	.047	.368	.137	.988
Constant	-1.665	1.705	.953	1	.329	.189		

4.8.2 Part II: Results of Linear Regression Analysis

Table 12 presents results when age, income, stigma scores and distance were regressed against duration of delay in seeking TB treatment. Age, distance and stigma scores were found to have a statistically significant effect on TB treatment delay despite low r-squared correlations, while the monthly income was found not to have any significant effect on treatment delay. Duration of delay tend to increase as age, distance and stigma scores increase, while delay decreases with an increase in the monthly income. According to the findings, 5%, 3.9%, 1%, and 10.4 % of variation in treatment delay among TB patients was attributable to age, distance, monthly income and stigma scores, respectively. This implies that factors other than the four considered in linear regression have a major role to play in delay in seeking TB treatment among the patients. The results were also confirmed by the Analysis of Variance (ANOVA) for the regression equations.

Table 12: Results of Linear regression analyses

Variables	R square	Adjusted R square	Unstandarised coefficients	Std,error	Standarised Coefficients	Coefficients Significance	95.0% C.I.for B	
			B		Beta		Lower	Upper
Age in years	.051.	.044	1.356	.552	.227	.009	0.354	2.418
Monthly income	.010	.002	-.443	.395	-.098	.264	-1.224	.338
Distance in KM	.039	.031	1.463	. 642	.197	.024	1.93	2.734
Stigma scores	.104	.097	2.166	.557	.323	.000	-	-

Predictors: (Constant), Age, Monthly Income, Stigma scores and Distance (KM)

Dependent Variable: # of days delayed .

5. DISCUSSION

This chapter discusses the findings in line with the objectives of the study as well the fundamental issues of delay in seeking TB treatment.

5.1 Socio –Demographic Characteristics

In this study, among the 132 smear positive pulmonary TB patients interviewed, slightly more men than women were interviewed (59.1% versus 40.9%). This finding is similar to a review by Dye (2006) which indicated that TB is more commonly found in men.

Most of the respondents were aged 15 – 34 years indicating that majority of respondents were young adults. The number of patients who delayed in seeking TB treatment was significantly higher in the 35-55 year-age-group than in the 15-34 year-age group. Overall, age was found to have a statistically significant effect on patient delay. Delay significantly increased with an increase in age of the patient ($p=0.009$). This finding is in line with the findings of studies carried out in Lusaka and Lagos (NRITLD, 2002; Olumuyiwa et al., 2004).

About three-fifths of the respondents were illiterate. The high proportion of delay in seeking treatment was noted among less educated respondents (64.9 %). This appears to support the finding of a similar study carried out in West Africa, which established that delay in seeking treatment was longer in those who did not attend school or were illiterate (Lienhardt et al., 2001). In this study, level of education was found to be significantly associated with delay in seeking TB treatment when considered on its own but on controlling for confounding, it was found not to have a statistically significant effect on treatment delay. This concurs with the findings of the study carried out in Lagos by Olumuyiwa et al. (2004).

Although there were some IDPs, returnees and internal migrants in the study, majority of the study patients (68.9 %) were residents of Belet-Weyne town. The findings from the study showed that patients who were subsistence farmers delayed in seeking treatment more than in other occupations. Possibly, the reason could be that the patients in this occupation had less time to seek treatment since they are busy with farming activities, although this was not conclusively confirmed by this study.

Most of the respondents (73.5%) earned less than $30 per month. This was an indication that most of the study subjects came from low socio-economic status group. Poverty often precludes health seeking until the person can no longer be able to contribute to the livelihood of the family or household. This study confirmed that those earning less than $30 per month had the highest delay period as compared to those earning more than $30 per month. Monthly income was found to have a statistically significant effect on TB treatment delay when it was considered singly, in cross-tabulations although this was not the case when both linear regression and multiple regression (i.e. controlling for confounding) analyses were conducted.

5.2 Delay in seeking TB treatment

This study found that there was a substantial delay in seeking treatment for pulmonary TB from the time of onset of symptoms to initiation of treatment. This delay has great public health implications in densely populated as well as among the highly mobile population in Belet-Weyne town. Ideally, the duration of symptoms before treatment should be as short as possible to ensure a better outcome (WHO 2006b). However, considering the local situation and also referring to other studies that have used this cut-off point, this time frame is deemed appropriate for this study (Martinho et. al. 2005). The researcher took a 60-day cut-off point for patient delay for measuring the length of patient's delay. For this, some fundamental

symptoms namely coughing for three weeks or more, fever in the evening and night, chest pain, weight loss and presence of blood when coughing were among the major symptoms considered when suspecting TB infection. Majority of the patients had identified continuous coughing for three or more weeks and fever as important indicators for TB infection.

In this study, the median of patient delay of 86 days (mean 112.5 days) was higher than those obtained in previously carried out studies in Ethiopia and Ghana which found median patients' delay of 30 days and 3 – 4 weeks, respectively (Solomon et al, 2005, Lawn S., Afful B. & Acheampong J, 1998). These differences could perhaps be attributed to better health care systems in these countries, with improved access to health care. However, a multi country study of seven countries including Somalia, conducted in 2006 reported higher rates of delay, which for Somalia was reported at 79.5days, which is consistent with the findings of this study. The main determining factors listed again were somewhat consistent with the findings of this study, of socio-demographic (illiteracy, suburban) stigma, time to reach the health facility and seeking care from non specialized individuals (WHO 2006b).

5.3 Knowledge of TB

Knowledge is an essential component in self-care. There is a growing perspective of need to acquire knowledge about the risk associated with TB infection in order to curb further infection and spread. Lack of awareness of the risk posed to the community by sputum positive pulmonary cases is a major impediment in the control of TB.

Knowledge on signs and symptoms across the entire study population was particularly at good level (93.1%) as the respondents were familiar with the signs of TB. Despite the good knowledge, however, majority (55.3%) of them still delayed in seeking treatment, especially, when compared to those with low knowledge.

Despite the respondents' overall good level of knowledge on TB, this study found some misconceptions about the cause of TB, especially regarding signs and symptoms as well as causes of TB. A similar study carried out in Mankweng, Limpopo province, South Africa (Supa, & Peltzer, 2005) reported that the proportion of patient's delay among those who knew less about causes of TB was higher than the proportion among those who had high knowledge on causes of TB. This study found the overall knowledge on transmission, prevention and recovery among respondents to be quite low. This can however be linked to low levels of education since majority of them were illiterate and had little information on TB. The knowledge of TB diagnosis among the study population was at an average, as most of the respondents had correctly mentioned at least two main methods used in TB diagnoses, mainly sputum examination and chest x-ray.

This study established no statistically significant difference between delay and knowledge of tuberculosis ($P>0.05$). This concurs with the findings of NRITLD (2002), and Olumuyiwa et al. (2004) but inconsistent with those obtained in a study conducted in Ethiopia by Madebo and Lindtjørn (1999), who found length of delay between the onset of symptoms and patient first visit to health care to be associated with patient inadequate knowledge of TB treatment.

5.4 Perceptions of TB patients

The overall perception of severity, curability, outcomes of majority (55.3%) of the study subjects was found to be low.

This study found a considerable difference in patient delay among patients with high overall perception on tuberculosis and those with low perception (48.8% versus 60.2%). However, the difference was found not to be statistically significant when considered singly, but statistically significant when logistic regression analysis was conducted.

In relation to perceived severity, the proportion of patients' delay among those with high perception was higher than those with poor perception (57.6% versus 46.8%), but the association between perception of severity and delay in seeking TB treatment was found not to be statistically significant (p=0.231). Respondents with low levels of perception on barriers were found to have delayed more or less the same as those with high perception of the same. More than half of the respondents perceived that susceptibility was related to close contact with TB patients and sharing food with TB patients. One possible reason for this is that they perceived TB infection as a dangerous and contagious disease which is incurable. This perception has many social implications, such as, stigmatization and social isolation of TB patients and their families. Studies from different cultures in Africa have consistently reported this popular perception. Although strict separating of eating and drinking utensils for TB patients contributes to general hygiene; it can also prevent TB transmission (NRITLD, 2002). Only 46.2% still perceived that living with TB patients will make them vulnerable to infection with TB disease. They incorrectly perceived that TB was only slightly dangerous or a harmless disease and did not consider themselves vulnerable to TB. Only 22.7 % of the respondents perceived that TB is not serious and will not affect their working habits and thus they could continue with their daily activities even if they got TB. Slightly over half (56.8%) of the respondents agreed that TB patients hardly have social activities. The reason for this perception is that TB drugs cannot easily cure TB disease and severity of disease is long, so patients often feel barriers in participating in social activities. On perceived barriers to accessing TB treatment, nearly half (45.5%) of the respondents agreed that there were barriers affecting access to TB treatment, although they were not significantly associated with treatment delay. The above mentioned misperceptions among some of the study subjects regarding the performance of TB drugs, TB being either slightly dangerous or a harmless disease may contribute to delay in seeking treatment for it. For those that perceive

TB as a serious disease may be stigmatized as they may not want other people to know their disease status and hence delay in seeking treatment. Some of perceptions items such as that TB is not a serious disease , it has an impact by minimizing social life and if one infected with TB, other family members will also be vulnerable were found to be significantly related to stigma (annex 11).

5.5 Stigma and TB

The stigma associated with TB often discourages patients from seeking treatment. This study established that 64.8% of the highly stigmatized patients were found seeking care for TB after 60 days of onset of symptoms. The stigma attached to TB in many cultures may make people uneasy in revealing their illness, since they fear being isolated by their families and society. In many cases, stigma has therefore been found to be a major compelling reason for people with TB to keep their disease secret. Several studies in different socio-cultural contexts, such as, Vietnam, have come up with evidence that stigma is closely attached with TB, and results in delay in seeking health care (Meursing, 1997; Liefooghe, 1997).

In this study, stigma was found to have statistical significance on patients' delay in seeking TB treatment before and after controlling for confounding as well as in linear regression analysis. Similar findings were also found in other studies (WHO, 2006b). In this study, stigma scores attributed to 10.4% of variation in patient delay. The remaining about 90% was attributed by other factors not in the model. It was also noted that as percentage stigma scores increased, the patient delay also tended to increase.

5.6 Type of the first contact health care provider

This study found that 35% of the TB patients had visited traditional healers on discovering they had TB while others visited pharmacies, doctors' private clinics, village health workers

42

and a small number TB clinic. Slightly over three-quarters (78.7%) of the patients who first consulted traditional healers on learning they had TB were found to have delayed in seeking treatment as opposed to those who went to other health care providers ($p<0.05$). In this study, patient delay was found to be significantly associated with the type of first contact health care provider, although this was not the case when confounding was controlled for. In Kenya, Liefooghe, et al, (1997) had also reported similar findings particularly the prolonged self-treatment and consultation with the traditional healers. The practice of seeking treatment from such health care providers lead to delay in TB treatment and therefore increase transmission of the disease as well as worse prognosis for such patients. This problem could be tackled if awareness campaigns could be used as strategy to enlighten the public on the causes, transmission and preventive measures against TB, as well as importance of early seeking treatment in TB treatment.

5.7 Accessibility to the treatment centre.

Accessibility to diagnostic health facilities is an issue of equity in patients' health and more so with TB control programmes. In this study, accessibility to health care was measured by reflecting on the physical distance (as opposed to looking at the perspectives of health rights, economics and socio-cultural) in kilometers from the patients' residence to the treatment centre. Distance to the treatment centre was found to influence patients' delay in seeking treatment as evidenced by analyses from both cross-tabulation and linear regression ($p<0.05$). Patient delay was found to increase with the distance to the treatment centre. Patients who traveled more than five kilometers had higher percentage delay than patients who traveled less than five kilometers. Liefooghe, et al. (1997) reported that the main reasons for delayed presentation of TB include lack of understanding about TB, the stigma associated with the disease, inaccessibility of treatment centres and a preference for private practitioners. The study findings also concur with those found by Madebo T, and Lindtjørn B. (1999).

7.0 CONCLUSION

The following were the study conclusions:

1. The study found that the majority (54%) had a significant delay in seeking care beyond a reasonable cutoff, as seen in similar societies to Somalia, to Zamzam TB clinic and continue to serve as reservoirs of infection. Patients took a median time of 68 days from onset of symptoms to treatment, with older people exhibiting more delay than their younger counterparts.

2. The TB patients at Belet-Weyne generally had average levels of knowledge and perceptions about TB. Knowledge on signs and symptoms across the study population was at a good level. It was also noted that overall knowledge regarding transmission, prevention and recovery among respondents were quite low. Despite the respondents' average knowledge on TB, these were misconceptions on causes of TB, such as, bad cold/fever, hard work and trauma, smoking, hereditary factors, witchcraft and shaking hands, among others. More importantly, knowledge did not appear to affect delay in seeking treatment.

3. Level of perception was found to have a statistically significant effect on treatment delay.

4. Age and distance to the treatment centre were found to significantly influence treatment delay when other factors are not controlled for (from linear regression analysis conducted).

5. In this study, stigma was found to be a major contributing factor to delay in seeking TB treatment in Belet-Weyne. About two-thirds (64.8%) of highly stigmatized patients were found to have delayed in seeking treatment for over 60 days as compared to 41% of those not stigmatized.

6. The results of this study indicate that patients in lower income brackets (<$30 per month) had a higher percentage of treatment delay than those patients with monthly income greater than $ 30. However, income had no statistically significant effect on treatment delay.

7. Level of education was found to be associated with delay, although not the case when confounding was controlled for.

8. The study found that the type of the first contact health care provider (i.e. village health workers, traditional healers, pharmacies, etc.) was associated with patient delay. This was confirmed from cross-tabulation analysis, but not by logistic regression analysis.

7.1 RECOMMENDATIONS FOR IMPLEMENTATION

1. There is need for TB care and treatment providers to educate the community (including TB cases) on causes, transmission, prevention and recovery in order to improve their knowledge on tuberculosis.

2. TB care and treatment providers should implement educational programmes focusing on reducing stigma and improving perceptions regarding TB in communities as well as in health institutions. Tackling the problems of misperceptions, as evidenced by the study, would be a strategy to deal with stigma and thus reduce delay.

3. There is need for public health facilities to increase accessibility, especially targeting patients with high potential for delay in seeking treatment.

4. Private health practitioners (e.g. Traditional healers, Pharmacists, etc.) should be trained in handling TB cases especially in early diagnoses.

Recommendation for Further Study:

Qualitative data collection techniques should be employed in subsequent studies to understand reasons behind the delay for pulmonary TB treatment.

8.0 REFERENCES

Auer C, Sarol J Jr, Tanner M & Weiss M (2000) Health seeking and perceived causes of tuberculosis among patients in Manila, Philippines. *Tropical Medicine and International Health* **5**, 648–656. Synergy, Medline,

Brown (1999).Health Belief Model.In University of South Florida.[Online]. Communication Initiative. Available at: http://hsc.usf.edu/~kmbrown/HealthBelief_Model_Overview.htm. [accessed 8July2007].

Daniel WW (1999). Biostatistics: A Foundation for Analysis in the Health Sciences. 7th edition. New York: John Wiley & Sons.

Dye, C. (2006).Global epidemiology of TB. Lancet journal.[Online]. Available at :http:// www.thelancet.com/journals/lancet/article/PIIS0140673606683840/fulltext .[accessed 20 March 2007].

Harries A.,Nicola J., Julia K., Amina J., et al.(2001).Deaths from TB in sub-Saharan African countries with a high prevalence of HIV-1. Lancet, 9267 (357), pp.1519-1523. [Online]: Available at: http://www.thelancet.com/journals/lancet/article/PIIS0140673600046390/fulltext. [accessed 14March 2007].

Jochem, K. ,& Walley, J.(1999) Determinants of the TB burden in populations. In: Porter J D H, Grange J M, eds. TB—an interdisciplinary perspective. London: Imperial College, 1999: pp 33–48

Kim SJ,.(2002) Aetiology and Pathogenesis.. TB Epidemiology and Control. New Delhi In Narayan JP, editor., WHO Regional Office for South-East Asia,

Kawathana k. (1988). The factors related to behaviour of delayed treatment and therapy of pulmonary tuberculosis patients,[M.A. thesis]. Bangkok: Faculty of Graduate studies, Mahidol University.

Liefooghe, R. , Baliddawa , J B., Kipruto, EM. , Vermeire, C. , De Munynck. (1997b) From their own perspective. A Kenyan community's perception of TB. Trop Med Int Health 2(8), August pp. 809-821. [Online].Available at: http://www.blackwell-synergy.com/links/doi/10.1046%2Fj.1365-3156.1997.d01-380.x Blackwell Science Synergy). [accessed 14March 2006].

Lawn, S., Afful, B. and Acheampong J. Pulmonary tuberculosis: (1998). Diagnostic delay in Ghanaian adults. Int J Tuberc Lung Dis. 2(8): PP.635-640. Also available in [PubMed

Liam CK, Lim KH, Wong CMM, Tang BK,.(1999). Attitudes and knowledge of newly diagnosed tuberculosis patients regarding the disease, and factors affecting treatment compliance. Int J Tubercul Lung Dis 3: 300–09.

Lienhardt, C., Rowley ,J., Manneh, K. Lahai, G., Needham ,D., Milligan, P.,&, McAdam KP. (2001). Factors affecting time delay to treatment in a TB control programme in a sub-Saharan African country: The experience of The Gambia. Int J Tuberc Lung Dis, 5(3), P.233

Lwanga SK and Lemeshow S (1991). Sample Size Determination in Health Studies: A Practical Manual. Geneva: World Health Organization

Madebo T, Lindtjørn B (1999) Delay in treatment of pulmonary tuberculosis. An analysis of symptom duration among Ethiopian patients. *Meds cape General Medicine*

Martinho APS, Maria FPM, Ricardo AA, et al.(2005). Risk factors for treatment delay in pulmonary tuberculosis in Recife, Brazil. BMC Public Health. 5(25), August, pp.1471-2458.

Meursing K. A. (1997a) World of silence: living with HIV in Matabeleland, Zimbabwe. Amsterdam: Royal Tropical Institute (KIT), 1997

National Research institute of tuberculosis and lung disease (NRITLD). (2002). Eastern Mediterranean health j. 8 (3).pp.324-9 March Teheran, Islam republic of Iran

Olumuyiwa O .Odusanya& Joseph O Babafemi.(2004). Patterns of delays amongst pulmonary tuberculosis patients in Lagos, Nigeria. *BMC Public Health* 2004, 4(18). Available[on line]: http://www.biomedcentral.com/1471-2458/4/18 [acessed August27,2008]

Pirkis JE, Speed BR, Yung AP, Dunt DR, MacIntyre CR, Plant AJ: (1996).Time to initiation of anti-tuberculosis treatment. *Tuberc Lung Dis* 1996, Vol#??no. 77,pp.389-390

Supa P., & Peltzer, K.(2005). Perceptions of TB: Attributions of Cause, suggested Means of Risk Reduction, and Preferred Treatment in the Limpopo Province, South Africa, J Health Popul Nutr. 23(1),pp.74-81.

Styblo K,(1991).Epidemiology of tuberculosis. 2nd edition. The Hague, Royal Netherlands Tuberculosis Association, p27-31.

Solom ,Yimer,.Bjune,, G., Alene, G. (2005). Diagnostic and treatment delay among pulmonary tuberculosis patients in Ethiopia: Cross sectional study. BMC Infectious Diseases. 112 (5).[Online] available: http://www.biomedcentral.com/1471-2334/5/112. [28/03/06].

SACB. (2003). Strengthening TB activities in Somalia. SACB report, Nairobi, Kenya

Wandwalo ER, Morkve O. (2000),Delay in tuberculosis case-finding and treatment in Mwanza, Tanzania**.** *Int J Tuberc Lung Dis*, no.4, pp**.**133-138. PubMed

Weintraub,M.(1975). Promoting patient compliance. Role of health professionals, government, and the pharmaceutical industry N Y State J Med.;75:2263-2266

WHO. (2006a). Annual Report.WHO Somalia 2006. [Online]. Available at: http;// www.emro.int/somalia. [accessed 4 June 2008].

WHO (2006b). Diagnostic and Treatment Delay in Tuberculosis in 7 Countries of the Eastern Mediterranean Region. [Online]. Available at: http://www.emro.who.int/dsaf/dsa710.pdf. [Accessed 2 April 2008].

WHO (2005) Global TB Control: Surveillance, planning, financing. WHO Report 2005. WHO/HTM/TB/2005.349. Geneva:

WHO (2003): Global tuberculosis control surveillance, planning, financing. Geneva, World Health Organization, 2003 (WHO/CDS/TB/2003.36). WHO report

WHO. (2004). Annual report, WHO Somalia.

WHO. (2002). Global tuberculosis control surveillance, planning, financing. Geneva

Yusuf M. (2004). Delay for pulmonary TB Treatment and its related factors. [MPH Thesis]. Bangkok: faculty of graduate studies, Mahadol University.

Xu B, Fochsen G, Thorson A,.(2004) Perceptions and experiences of health care seeking and access to TB care – A qualititative study in rural Jiangsu Province, China. Health Policy 69:139–49.[CrossRef][ISI][Medline]

Zamzam.(2004-2006).TB control, Annual Report,Belet-Weyne district, Hiran- Central Somalia.

Annexes

Annex 1: Questionnaire

All questions are to be addressed to the TB patients aged > 15 years, at TB centre.

Date of interview____/____/_____ (dd/mm/yyyyy) interviewer:_____ ID#.____

SECTION A: Socio-Demographic Information

Q1.Age (in years (15 and above)_____. Q2.Gender: 1=Male 2=Female/ **Q2 What**

is your current marital status? 1= Married 2= Single 3= Widowed 4= Separated 5=

Divorced

Q3. What is your highest level of education?1 = Illiterate 2= Literate/Primary (1-5) 3=.

Lower secondary (6-8) 4= Secondary (9-10) 5= Higher Secondary or more (11+)

Q4. What is your employment status? 1= Skilled worker 2= I Unskilled worker 3=

Subsistence farmer 3=. Unemployed 4= Business 5= Other (specify_____

Q5. What is your residence status? 1=. Resident (local) 2=.IDPs 3= Internal migrant 4 =

Returnees 5= others

Q6. How much is your average monthly income?(in USD) USD _____

Section B. Onset of symptoms

Q6.When was the onset of symptoms of this disease first started or you realized? (e.g.

evening fever, night sweats, coughing, and loss of weigh] which of these?

_____/_____/_____ (dd/mm/yyyy)

If the exact date is not available, then code: _____ (1, 2, 3, or 4)

Note:

 Code 1 = 04, if started in the first week of the month

        2 = 11, if started in the second week of the month

        3 = 18, if started in the third week of the month

4 = 25, if started in the fourth week of the month

Even if it is not available in above coding, then code: _____ (05, 15, or 25)

Note: code 05, if started in the early days of the month

15, if started in the middle days of the month

25, if started in the end days of the month

Q7. Whom did you seek treatment when you first experienced major symptoms of TB?

1= Drug shops / pharmacies 2= . Private **3**= Village health worker 4= Traditional healer 5=

TB clinic /DOTs Clinic 6= Others(specify____

Q8. Treatment commencement-(Information to be obtained from TB Registers/Patient's

Treatment Cards)

	Treatment start date	____/____/_____(dd/mm/yyyy

Q9. How far is it from your original residence /home to the current DOTS centre where

you are now started -TB drugs? (state the approximate distance in Km and travel time in

minutes for one way). _____ Km. _____Min.
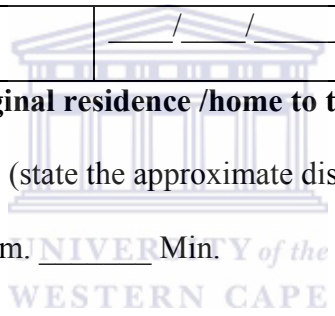
Section: III. Knowledge of TB

Put following the correct answer (1) and incorrect answers (0)]according to patients response only .

	Questions	YES	NO
I	**What did you know about the cause of TB?-[causes of TB]**		
1	TB can caused by smoking and alcohol		
2	TB is communicable disease caused by germs/micro-organism		
3	TB can be caused by hard work or trauma		
4	Witch/evil-eye		
5	Cold		
6	TB is one of the hereditary disease		
II	**What did you know about the most important symptom of TB?(Signs and symptoms)**		
8.	Coughing more than three weeks		
9.	Fever in the evening and night		
10.	Chest pain		
11.	Cough with blood		
12	Headache		
III.	**What did you know how is TB transmitted mainly?-[Transmission**		
15	Near by coughing from a TB patient		
16..	Having common utensils/food		
17.	Hand shaking		
18.	Others (specify) _____		
IV	**What did you know how is TB diagnosed mainly? Diagnosis)**		
19.	Blood examination		
20.	Recognizing signs and symptoms		
21	TB can diagnosis by sputum positive		
22..	Chest X-Ray		
23	General body examination		
24	Stool and urine examination		
23.	Others (specify)		
V	**What did you know how is TB is prevented mainly?, (TB Prevention)**		
24.	Through vaccination		
25.	During coughing and sneezing the mouth and nose should be covered		

26.	Avoid staying in crowded place to prevent getting TB transmission		
27.	Avoid being air conditioning room with smoking people to prevent getting TB infection.		
VI.	**What did you know about the recovery of TB?(treatment of TB**		
28.	Curable through medication		
29.	Self-recovery		
30.	Praying with God		
31.	Traditional healing		
32	Cannot be cured		

5.0. Section: D. Perception of TB (Attitudes and Beliefs about Tb)

	Statement	Agree	Uncertain	Disagree
I	**Perceived susceptibility**			
1.	If you get close contact with TB patients you will easily get TB infection			
2.	If you eat food together with TB patient you can easily get infected			
3.	If you live in a crowded environment you can easily get TB infection			
4.	If one member is infected with TB, other members will be vulnerable too .			
II	**Perceived Severity**			
5.	Getting sick with TB, could lead to loss of your ability of your working			
6.	When you get infected you cannot work to earn your living as usual.			
7.	Most TB patients hardly have social activities			
8.	TB is a serious illness, you may have fatal outcome if untreated			
III	**Perceived benefits**			
9.	Anti TB drugs can stop the transmission of the disease			
10	Anti-TB drugs can decrease TB death rate			
11	Poor or rich TB patients have equal chance to be treated with anti –TB			
12.	TB patients who completed their treatment can live happily a normal life			
IV	**Perceived barriers**			
13.	It is rather difficult to take anti TB-drugs			
14.	When receiving TB drugs from the clinic, most of the health workers are friendly with you.			
15.	You feel it a waste of time while undergoing treatment with anti-TB drug			

16.	The expenses for TB treatment are costly (e.g. Traveling ,no social s support etc)			

Please mark the correct answer [√] according to your opinion on the following statements

Stigma

What did you think/feel about the following statement?

	Statement	YES	NOT SURE	NO
1	You were preferred to stay away from your neighbours and friends, when you got TB first time.			
2	People would become lonely when they got TB.			
3	Being a TB patient, you are treated very normal in your family, as before.			
4	Being a TB patient, you are reputed very normal from your neighbors, as before			
5.	In our society, it is difficult to get married for an unmarried young person who got TB.			
6	TB is the disease of the poor people only.			
7	In fact, TB is caused as the punishment for sinful act.			

Annex2: Questionnaire – Somali version

Weydiimaha sahanka TB

Waraysigani waxaa lala yeelanayaa oo keliya Bukaaanada cusub oo ay xaakadoodu (+)

ka tahay , Dad'doodu ka weyn tahay 15 sano ee ku sugan xarunta TBda .

Taariikhda waraysiga ___/___/____ (dd/mm/yyyyy   Warayste:_____ NO#.____

Qyebta A: Warbixinta Xaalaadda Guud

Q1. Da'da (Qor inta sano uu bukaanka jiro**)_____. Q2.Jinsiga :** 1=Lab   2=Dhedig

Q3 Xaaladda Guurka ? 1= Xaas 2= Aan weli guursan 3= Garoob   4= kala tegay   5=
La furay

Q4. Heerka waxbarshada ? 1 = Aan waxba qorin   2= Dugsi hoose (1-5) 3=. Dugsi dhexe
(6-8)

4= Dugs sare (9-10) 5= Jaamacad iyo wax ka sareeya (11+)

Q5. Xaaladda shaqada? 1= Shaqaale xirfad leh 2= Xoogmaal 3= Beeraleey 3=. Aan
shaqeyn

4= Ganacsi 5= kuwo kale (Caddee_____

Q6. Xaaladda Deegaanka ? 1=. Deegaan 2=. Soo Barkacay 3= Dal doorsi ku yimid   4 =
Qaxooti soo noqday 5= Kuwo kale (caddie-------------)

 Q7. Celceliska dakhliliga ee bisha ku soo gala **?(Doolar ahaan))** USD _____

 Qeybta B. xilliga Cabashada, xilliga daawada,Goobaha daawada iyo foogaanta.

Q8 Ma xasuusan kartaa xilligii kuugu horeysay oo aad dareentay caalamadaha ugu

culus ee Xanuunkan(sida qandhada fiidkii, dhidka habeenka qufac iyo miisan dhac)

_____/_____/_____ (dd/mm/yyyy)

Q9. Goorta Daawada loo bilaabay -(Ka fiiri Kaarka daawada amd diiwaanka)

	Taariikhda daawada loo billabay	____/____/_____(dd/mm/yyyy

Q10. Xagee ayaad macin biday markii kuugu horeysay oo aad isku aragtay

/dareentay calaamdadha cudurkan? 1= Farmasi 2= . Goob caafimaad gaar ah **3=**
Daryeele caafimaad 4= Daawo dhaqameed 5= Xarunta TB 6= Meelo kale (Caddee____

Q11.Masaafo intee la'eg ayey kuu jirataa xaruntan aad hadda daawada ka qaadato iyo

Degaankii rasmiga ahaa ood ka timid ? (sheeg Kilomitarka ugu dhaw iyo waqtiga safarka
ee soo socod keliya). _____ Km. _____ Min.

Qeybta : C Aqoonta bukaannada ee Cudurka TB

Dooro Jawaabta ugu saxsan oo geli (1) ,Jawaabaha khaldanna u isticmaal (0) adigoo isticmaaalyaya fahamkaaga .

	Weydiimo	YES	NO
I	**Maxaad ka taqaannaa wayaabaha Sababa cudurkan qaaxaada?**		
1	Cudurkan waxaa sababa sigaar cabista iyo Qamariga .		
2	Cudurkan waa cudur faafa oo ay sababaan jeermi ama Noole dahsoon		
3	Cudurkan waxaa sababa shaqda adag iyo Jug		
4	Sixir ama Isha biniaadmiga		
5	Hargab xumaaday		
6	Cudurkan waxa uu ka mid yahay cudurada la iska dhexlo		
II	**Maxaad ka ogtahay caalmadaha iyo cabashooyinka ugu caansan cudurkan ?**		
7.	Qufac ka badan muddo Seddex Todobaad ah		
8.	Qandho Galabtii iyo Habeenkii ah		
9.	Xabad xanuun		
10.	Qufac uu dhiig la socdo		
11	Madax xanuun		
III.	**Maxaad ka ogtahay sida uu inta badani ku fido cudurkan ?**		
12	Bukaha oo ku qufaca qof agtiia jooga		
13.	Cuntada oo la isla cuno ama weelasha oo la isla isticmaalo/		
14	Salaan		
IV	**Maxaad ka ogtahay sida inta badani cudurkan lagu ogaado ama lagu xajiiyo)**		
15.	Dhiigga oo la baaro		
16.	Waxaa lagu gartaa calaamadha iyo cabashada bukaha .		
17	Waxaa la ogaadaa Candhuufta oo noqota (+)		
18.	Raajada Feeraha		
19	Baaris guud ee jirka		
20	Saxarada iyo kaadida oo la baaro.		
V	**Maxaad ka og tahay siyaabaha inta badan looga hortagi karo cudurkan ?**		

21.	Iyadoo la deegsado Talaal		
22.	Afka iyo sanka oo la daboolo xilliga Qufaca ama Hindhisada .		
23.	In aad iska illaaliso tegidda meelaha dadku ku badan yahay		
24.	In aad iska ilaaliso Joogista guryaha marwaxadaha leh oo ay joogaan dad sigaar caba		
VI.	**Maxaad ka taqaan siyaabaha looga bogsoon karo cudurkaan?**		
25.	Waxaa looga raysan karaa iyadoo daawo la qaato.		
26.	Waxaa looga raysan karaa Iskiis		
27.	Alle oo la baryo.		
28.	Daawo dhaqameed		
29	Lama daaweyn karo		

5.0. Qeybta: D. Aragrtida bukaanada ee cudurka -Fadlan ku qor Sax [√] haddallada hoos ku qoran, adigoo adeegsanaya ra,ayigaada

	Mowduuc	Ku Raacay	Ma hubo	Kuma Raacsani
I	**Aaminsanaata u Noglaashaha cudurka**			
1.	Haddii la joogtid Bukaan TB qaba , waxaa si sahlan kuugu dhici karo cudurka			
2.	Haddii aad la cuntayso bukaan qaba TB, waxaa si sahlan kuugu dhici karo cudurka			
3.	Haddii aad ku nooshay meel isku raran ah , waxaa si sahlan ah ku qaadi kartaa cudurka			
4.	Haddii xubin qoyska ka mid ah ay qabto cudurkan,Xubnaha kale ee qoyskana way u nugulaadan			
II	**Aaminsanaata Khatarta cudurka**			
5.	Qaaxadu waa cudur halis ah oo geeri sababi kara haddii aan la daaweyn			
6.	Inta badan bukaanada TB ma qaban karaan shaqooyin culus			
7.	Qaaxadu waa cudur aan sinaba looga bogsoon karin			
8	Qaaxadu ma aha cudur halis ah – Howlahaada ayaad wadan kartaa.			
9	Hadii cudurkan ku haleelo, waxaa ku dhici karo shaqo la'aan .			
III	Aaminsanaata waxtarka daaweynta			
10.	Daawooyinka cudurkani waxay joojin karaan fiditaanka cudurka			
11.	Daawada cudurkani waxay yareyn kartaa heerka dhimashada			
12.	Bukaanada TB (faqiir iyo qaniba) way u siman yihiin daaweynta cudurka TB			
13	Bukaanka daawada dhamaystaa waxuu ku noolan karaa nolol wacan oo raaxo leh			
IV.	**Aaminsanaata Caqabadaha cudurka**			
14	Qaadashada daawada TBda ma aha wax fudud .			
15	Shaqaalaha caafimaadku waa ku jeclaanayaan marka aad daawada qaadanayso			
16.	Waxaad dareemaysaa waqti lumis xilliga ay daaweynta TBdu kuu socoto			
17	Kharashyada daaweynta cudurkan waa mid aad culus(nolosha,safarka iwm)			

Takoorid /Dhaleecayn

	Akhbaar - Maxay kula tahay Hadallada hoos ku qoran ?	Haa	Ma hubo	Maya
1.	Waxaad doorbi lahayd in aad ka haaajirto deriskaag/asxaabta markii cudurku ku asiibay			
2.	Dadku waxay dareemaan Cidlo markii ay Qaaxo ku dhacdo.			
3.	Ka bukaan ahaan , qoyskeygu si caadi aha ayuu illa dhaqmaa.			
4	Ka bukaan ahaan, deriskeygu si caadi aha ayuu iila dhaqmaa .			
5	Bulshadeena way ku adag tahay in la guursado qof ay TB ku dhacday .			
6	Cudurka Qaaxadu waa cudur haleela dadka Faqriga oo keliya			
7.	Dhab ahaantii,Qaaxadu waa sabab u tahay ciqaab danbiyeed dadku geystay			
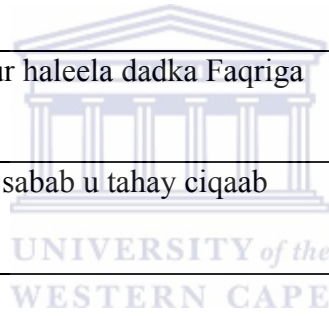
Annex 3: Consent form

PARTICIPANT INFORMATION SHEET

Researcher: Abukar Yusuf Nur

MPH student, School of Public Health, University of the Western Cape, South Africa

Supervisor: Jon Rohde, MD

Professor of Public Health, UWC, School of public health

Title of the study: Factors influencing Delays in seeking TB Treatment in Belet-weyne District, in Somalia.

Study site: Zamsam TB Treatment centre Belet-weyne, Central Somalia.

Study background /Purposes

You are invited to participate in a research study on delay for pulmonary TB treatment. As you are aware, many TB patients in our community are seeking care quite late. This causes problems to the individuals and to the society as a whole. It is therefore important to have an understanding of extent of delay for getting appropriate diagnosis and treatment of the disease.

We also need a better understanding of what factors could be influencing such delays. The information you provide on the basis of your experiences as a TB patient will help to develop policies and interventions aimed at reducing delay.

You are selected as a possible participant because you are a client of this treatment centre. A total of 137 people will be enrolled in this study. We ask that you read this form and ask questions you may have before agreeing to be in the study.

What will I have to do? (Procedures)

If you agree to participate in this study, we would like to ask you to take part in a survey that will take you about 30 – 40 minutes to complete. You will be asked about your TB treatment seeking history and your understanding about the disease, perceptions and some details about your age, education and employment.

Why have I been asked to take part in the research work?

You have been requested to take part in this research work because we can learn from your experience of seeking TB treatment.

What are the risks and discomforts?

If you take part in this study,

There are no foreseeable physical and mental risks to you. However, you might feel uncomfortable recalling information about yourself and your actual practices regarding TB. Confidentiality will be upheld for information shared about your family income and your choice of health care providers. You may skip any question you do not want to answer or may discontinue taking part in the survey at any time.

What is being done to maintain confidentiality?

All your answers will be confidential. The steps I will take to protect your confidentiality are: I won't tell anyone, whether you take part in this study or not.

Your answers on the study will be kept confidential to the extent allowed by law, and there is no way we can link your name with your answer on the questionnaire, so, the whole process of study will be done in a way that no one could ever guess your participation in this study.

All the information documented will be kept locked so that none other than I, Abukar Yusuf Nur (researcher), and my research supervisor, Dr. Jon Rhode, will be able to see it.

What will be the benefits by taking part in this study?

There will be no direct benefit to you, but your participation is likely to help in understanding the delays in TB treatment and may help in developing policies and programmes for reducing delays in TB treatment in the future.

Any Incentives?

You will not be provided any incentive to take part in this research work.

What happens if I do not take part in this study?

You do not have to take part in this study. Your participation is voluntary.

You can change your mind and stop at any time.

Your refusal to participate in this study will not affect your right to your current or future treatment.

Any Questions?

You are encouraged to ask any questions now or later.

If you wish you may contact and talk to the researcher at:

Abukar Yusuf Nur

C/O Food security Analysis Unit –Somalia

Tel: 2525-63-52000(Res.),Cell ph:+2521-564186

E-mail: Abukaryn@ yahoo.com

Or the research supervisor:

Professor Jon Rohde, School of Public Health, University of the Western Cape

E-mail:jrohde@msh.org
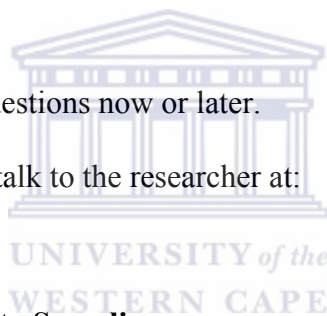
Annex 4: Consent form

INFORMED CONSENT FORM

Project Title: *FACTORS INFLUENCING DELAYS IN SEEKING TB TREATMENT IN BELET-WEYNE DISTRICT, IN SOMALIA.*

Responsible person(s) and   Institute:

Abukar Yusuf Nur, MPH student, School of Public Health, University of the Western Cape, South Africa

Supervisor: *Dr. Jon Rohde MD, Professor of Public Health, UWC, School of public health*

Date of consent……………………………… (day/ month/year)

(Mr. / Mrs. / Ms.) First name……………………..Last name……………………

Home address……………………….………………

I have read the information sheet or it has been read to me and I understand the details about the objectives and methodology of the study and the possible risks and benefits that may occur to myself or to my child by participating in the study. I voluntarily participate in the study and I understand that I may choose not to answer any question or to withdraw from the study at any time. I understand that the information will be kept confidentially. My name or child's name will not be presented in the study report. I understand that I shall be given a copy of the signed consent form to keep.

Signature…………………………...(Respondent/informant)

(Mr./Mrs./Ms………………………………………………….)

Signature……………………………………….(Researcher)

(For persons who cannot read and write).

I cannot read but before signing my consent, the investigator/interviewer read the information sheet and the informed consent form to me.

Signature / thumb stamp…………………… (Respondent/informant)

Signature………………………………………(Researcher)

(…………………………………….....)

Signature……………………………………....(Witness)

(……………………………………………)

You are encouraged to ask any questions now or later. If you wish, you may contact and talk to the researcher at:

Abukar Yusuf Nur

**C/O Food security Analysis Unit –Somalia, Tel: +2525-63-52000(Res.), Cell:+2521-564186**

E-mail: Abukaryn@ yahoo.com

Or the research supervisor:

Professor Jon Rohde

School of Public Health, University of the Western Cape

E-mail:jrohde@msh.org

Annex 5: Work plan

	Time/Activity	Mar'06	Apr	Apr06	Ma'06	May'06	Jun'06	June '06		06	2007			J-jul	Aug07	Sept'07	Oct'07
		19-31	1-6	7.-12	5-11	19-25	26-31	1-8	9-19	Oct/Nov	Feb14	May	June 2-8	9-31	1-31		
1	Framing the Research question	▓															
	Meeting with Stakeholders	▓															
2	Formulating aims and objectives	▓															
3	Literature Review		▓														
4	Share draft with lecturer(e.g. sending draft for comments		▓														
5	Submission of first assignment			▓													
6	Methodology/study designs, sampling			▓													
7	Development of data collection instruments				▓												
8	Plan for analysis (dummy tables)					▓											
9	Proposal Development						▓	▓									

No	Task																			
10	Submit draft research protocol								▓											
11	Refine research proposal									▓										
12	Submission for clearance										░									
13	Translate questionnaire											░								
14	Identify enumerators											░	░							
15	Meeting with Clinic staff , and other stakeholders											░	░							
16	Training of enumerators												░							
17	Pretest questionnaire												░							
18	Logistics preparation												░							
19	Data collection,& entry													░						
20	Analyze data														░					
21	Share preliminary results with partners/stakeholders															░				
22	Report writing																░			
23	Share actions- stakeholders																░			
24	Follow up implementation																░			

Annex 6: Budget

ITEM	Unit cost (USD)	Multiplying Factors	TOTAL Cost /USD
1. Allowances/per diems			
a. Researcher(1)			
-Training of enumerators and pr-testing	$ 25/day	1x2= 2 days	50
-data collection	$45/day	1x5= 7days	315
b. Enumurators /Research assistants (3)			
-during training /pre-testing	$10/day	3x2= 6days	60
-during data collection	$15/day	3x 5= 15days	225
c. Data assistants			
-Translating questionnaire into Somali(1)	$35	1x3= 3days	105
-Data entry clerks	$15	2x4=8days	120
Subtotal			**995**
2) Stationary			
-Plain Paper, A4 size	7.2	2 rim	14.5
- Pen, Black Ink	5.7	1 dozen	5.7
- Printer Cartridge	35.00	2 pcs	70.0
- photocopy , Journal, article	0.14	100 pages	14.5
- photocopy of questionnaires	0.14	1850 copies	259.0
photocopy, Thesis/proposal	7.2	3copies	21.6
Subtotal			**385.3**
D) Other costs			
-Refreshments(during meetings+ training)	-	-	42.0
Subtotal			**42.0**
Grand Total			**1,423**

*Annex 7: Results of Logistic regression analysis(**cutoff =60 days**)*

Variable	B	S.E.	Wald's statistic (x^2)	df	p-value	Odds ratio	95.0% C.I for odds ratio	
							Lower	Upper
Age (groups)	.475	.251	3.592	1	.058	1.608	.984	2.628
Monthly income	.110	.364	.092	1	.762	1.117	.547	2.279
Level of education	-.156	.233	.446	1	.504	.856	.542	1.352
Level of stigma	.965	.443	4.736	1	.030	2.624	1.101	6.254
Type of first contact	-.041	.130	.101	1	.751	.959	.743	1.239
Distance (KM)	.333	.231	2.085	1	.149	1.396	.888	2.195
Overall knowledge of TB	.460	.554	.691	1	.406	1.585	.535	4.689
Overall perception of TB	-1.000	.504	3.937	1	.047	.368	.137	.988
Constant	-1.665	1.705	.953	1	.329	.189		

*Annex 8: Results of Logistic regression analysis.(**cutoff =120 days**)*

	B	S.E.	X^2	Df	Sig.	Odds ratio
Tye of first contact	.090	.131	.477	1	.490	1.094
Monthly income	-.006	.009	.472	1	.492	.994
Distance to TR centre	.011	.013	.699	1	.403	1.011
Level of educaion	-.004	.253	.000	1	.986	.996
Level of stigmatization	1.001	.483	4.302	1	.038	2.721
Over all perception	-.127	.496	.066	1	.797	.880
Overall Knowledge on TB	.096	.094	1.047	1	.306	1.101
Age	.386	.252	2.342	1	.126	1.471
Constant	-4.117	2.183	3.556	1	.059	.016

*Annex 9: Results of Logistic regression analysis.(**cutoff =75 days**)*

	B	S.E.	X^2	df	Sig.	Odds ratio
Type of first contact	.042	.127	.109	1	.742	1.043
Monthly income	.001	.008	.014	1	.904	1.001
Distance to TR centre	-.001	.013	.008	1	.930	.999
Level of education	-.312	.246	1.612	1	.204	.732
Stigmatization	1.184	.469	6.384	1	.012	3.268
Overall perception	-.398	.478	.694	1	.405	.672
Oveall Knowledge on TB	.195	.092	4.492	1	.034	1.216
Age	.336	.245	1.885	1	.170	1.399
Constant	-4.203	2.080	4.083	1	.043	.015

Annex 10: Results of Logistic regression analysis.(cutoff =45 days)

		B	S.E.	X^2	df	Sig.	Odd ratio	95.0% C.I.	
		Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
Step 1(a)	Stigma	.923	.487	3.597	1	.058	2.517	.970	6.531
	Overall perception	.457	.481	.905	1	.342	1.580	.616	4.055
	Level of education	-.035	.244	.020	1	.886	.966	.599	1.558
	Age	.688	.260	7.001	1	.008	1.991	1.195	3.315
	Monthly income	-.004	.008	.201	1	.654	.996	.980	1.013
	Overall knowledge	.169	.095	3.139	1	.076	1.184	.982	1.428
	Constant	-4.706	2.046	5.287	1	.021	.009		

Annex 11: Summary of relationships between various items on perception and Stigma.

	B	S.E.	X^2	df	Sig.	Odds ratio	95.0% C.I.	
							Lower	Upper
Close contact with TB patients	.180	.453	.158	1	.691	1.197	.493	2.909
Living in crowded environment	-.327	.451	.524	1	.469	.721	.298	1.746
If one member is infected with TB, other members will be vulnerable too.	1.034	.479	4.647	1	.031	2.811	1.098	7.194
Getting sick with TB, could lead to loss of your ability of your working	.264	.373	.503	1	.478	1.303	.627	2.705
TB is a serious illness	-.054	.426	.016	1	.900	.948	.411	2.186
Lack/Minimised social life	1.125	.491	5.240	1	.022	3.079	1.176	8.066
TB can't be cured	-.305	.324	.887	1	.346	.737	.390	1.391
Tb is not serious ,you can go on working anyhow	.741	.313	5.622	1	.018	2.099	1.137	3.874
Anti-TB drug can stop the transmission	-.103	.487	.045	1	.832	.902	.347	2.342
Anti-TB drug can decrease death rate	.693	.457	2.298	1	.130	1.999	.816	4.895
Poor or rich TB patients have equal chance to treatment	.530	.364	2.121	1	.145	1.699	.833	3.465
TB patients who completed their treatment can live happily	-.795	.458	3.012	1	.083	.452	.184	1.108
It is difficult to take anti-TB drugs	.726	.386	3.540	1	.060	2.067	.970	4.405
Access to TB drugs from hospital difficult	.229	.377	.369	1	.544	1.258	.600	2.634
Time is wasted undergoing treatment with anti-TB drug	-.226	.406	.311	1	.577	.797	.360	1.766
It is expensive to get TB treatment	.613	.365	2.822	1	.093	1.846	.903	3.775
Constant	-8.011	1.596	25.199	1	.000	.000		