# TUBECULOSIS TREATMENT DELAY AND ASSOCIATED FACTORS AMONG PULMUNOREY TUBERCULOSIS PATIENTS AT HADIYA ZONE PUBLIC HEALTH FACILITY, SNNPR 2017.

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**Abstract**

***Background:*** *Early diagnosis and immediate initiation of treatment are essential for an effective TB control program. Delay in treatment is significant to both disease prognoses at the individual level and within the community. No study was determining associated factors which influence of TB treatment delay in study area.*

***Objective****: the aim of the study is to assess the TB treatment Delay and associated factor among PTB patients who are on treatment for the first two months.*

***Method****: Facility based crossectional study triangulated by Qualitative study was employed on 340 PTB patients from March 10-April 20, 2017 in Hadiya zone public health facilities among PTB patients. Three woredas were selected from two urban and ten district woredas by Simple random sampling then after proporssional allocation of TB cases, Simple random sampling technique is used to select study health facility. DOTS User at the beginning of data collection was consecutively recruited in to the study until the intended 340 sample size were fulfilled. Data was collected from the participants using a pretested structured interviewer administered questionnaire.Multivariable binary Logistic regressions were used to identify independent predictors of TB treatment delay for those variables which are candidate in bivariate analysis. A P-value < 0.05 at 95 % CI was considered statistical significance between dependent and predictors variables.*

***Result****: Among 340 PTB patients enrolled in the study, of which 49.1% experienced patient delay, 30% health system delay and 49.8% total delay. The median patient, health system and total delay were 31, 5, 35 days respectively. Unable to read and write, Poor knowledge of TB (AOR 3.96, 95% CI (2.28 6.86), self-treatment (AOR: 2, 95% CI (1.14 3.93), financial constraint (AOR: 2.092, 95% CI (1.11 3.945) were the independent predictors of patient delay. Visiting two or more health care providers (AOR: 3.40, 95% CI (1.910 – 6.07), prolonged referral (AOR: 3.004, 95% CI (1.59 5.67) were independent predictors of health system delay.*

***Conclusion and recommendation****: Nearly half of the total delay was contributed by patient delay.Unable to read and write, Poor knowledge of TB, self-treatment, financial constraints, prolonged referral, several visit of health care provider of two or more and ever used other drugs rather than Anti-TB drugs were found to have association with patient delay and health system delay. This may lead to continues existence of TB cases which probably leads to the emergence of MDRTB.* The he median health system delay isn't in the reasonable time with regard to situations on the ground. By this time supposed to manifest major pulmonary symptoms of TB. These patients were visiting two or more health care providers before diagnosis so that they could pose a risk to the health professionals as well unless otherwise properly managed.

**Key words:**TB treatment delay, PTB, patient delay and health system delay, Jimma, Ethiopia.

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## Acronyms and Abbreviation

CI Confidence Interval

CFW Conceptual Frame Work.

DOTS Directly Observed Treatment Short-course

EPTB Extra Pulmonary TB.

ETB Ethiopian Birr.

HIV/AIDS: Human Immunodeficiency Virus / Acquired Immunodeficiency Symptoms

HF Health facility.

MDR Multiple drugs resistant

NGOs Non-Governmental Organizations

NRITLD National Research institute of TB and lung disease

NTC National TB control program.

OR Odds Ratio

P Probability

PTB Pulmonary Tuberculosis

SDG Sustainable Development Goal

SNNPR South Nation Nationalities people region state

TB Tuberculosis

UN United Nations

WHO World Health Organization

# CHAPTER ONE INTRODUCTION

## 1.1 Background

TB is an infectious bacterial disease caused by Mycobacterium TB which commonly affects the lungs but can affect other parts of the body. Though it affects peoples of all ages and sexes, poverty, malnutrition, overcrowding and more recently human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) have been known for decades to make some groups more vulnerable to develop the disease[1, 2]

Patient delay is the time interval from the onset of symptoms of TB until the first visit to any formal health care facility within 30 days as cut off points. World Health Organization classifies person who presents with symptoms or signs suggestive of TB most common a productive cough or unexplained cough with or without other respiratory or constitutional symptoms lasting 2-3 weeks as TB suspect and the patient will seek treatments within the given period, patients presented to modern health facility more than 2-3 weeks considered as patient delay as WHO recommendation. However, studies added extra margin of 7 days to take 30 days as cut-off to assess magnitude of patient delay: a delay >30 day[3][4].

Health system delay in our context was the time ranging from patient's first contact to any modern health facility to date of initiations of Anti TB treatment. This comprises time spent during referrals between facilities, diagnosis and time between diagnosis and start of treatment and time spent on treatment of patients with drugs other than that for TB[5]

With over 2 million of the total global TB cases and between 250 to 400 thousand TB deaths, Africa is burdened with about 25% of total Global TB cases. The region is home to nine of the 22 high TB burdened countries. The incidence of TB in Africa remain the highest worldwide, the 2012 rate of new infections TB/HIV burden, a major risk factor the progression of the disease, thus a huge challenge to fighting the disease Was 275 per 100,000 populations with total prevalence at 373 per 100,000 populations. These figures far outnumber the global figures that indicate total incidence and prevalence at 127 and 190 per 100,000 populations

[1, 6]

.

It remains one of the world's deadliest communicable diseases.The disease which is a major global public health problem was declared a global emergency by the World Health Organization (WHO) in 1993. TB (TB) remains a major cause of morbidity and mortality and a significant global public health problem affecting about one-third of the world's population despite the implementation of preventive and control activities over the years[7, 8]

In Africa, the WHO Regional Committee for Africa also announces the disease an emergency due to its seriousness. The risk of infection is high from a person who is not on treatment especially if the contact occurs in poorly light, overcrowded family and poorly ventilated environments. In most cases, the body is able to contain the infection thus majority of individuals do not develop TB disease. Active TB disease flare up those who are susceptible condition, in the old and very young children (especially those under one year), the poorly nourished and individuals with poor immune defenses (such as persons infected with HIV, the risk of developing TB disease following an infection is high [1, 9].

The Sustainable Development Goals (SDGs) for 2030 were adopted by the United Nations in 2015. One of the targets to end the global TB epidemic. The WHO End TB Strategy, approved by the World Health Assembly in 2014, calls for a 90% reduction in TB deaths and an 80% reduction in the TB incidence rate by 2030, compared with 2015. This global TB report is the first to be produced in the era of the SDGs and the End TB Strategy. It provides an assessment of the TB epidemic and progress in TB diagnosis, treatment and prevention efforts, as well as an overview of TB-specific financing and research[9].

In 2015, there were an estimated 10.4 million new (incident) TB cases worldwide, of which 5.9 million (56%) were among men, 3.5 million (34%) among women and1.0 million (10%) among children. People living with HIV accounted for 1.2 million (11%) of all new TB cases. Six countries accounted for 60% of the new cases: India, Indonesia, China, Nigeria, Pakistan and South Africa. Global progress depends on major advances in TB prevention and care in these countries

Worldwide, the rate of decline in TB incidence remained at only 1.5% from 2014 to 2015. This needs to accelerate to a 4–5% annual decline by 2020 to reach the first milestones of the End TB Strategy[9].[10]. The country stands 7th among the 22 high TB burden countries and grouped

among the 22 high MDR TB burden countries. The estimated annual incidence and prevalence of TB in Ethiopia is 258 and 237 per 100,000 populations, respectively. A TB trend analysis study also indicated that the incidence rate of TB in Ethiopia was increasing at a rate of 5 new TB cases per 100,000 populations per year [9]

### 1.2 Statement of problem

TB (TB) is a global health concern; nearly one third of the global population is infected with Mycobacterium TB and at risk of developing the disease. More than 90% of global TB cases and deaths occur in the developing world, where 75% of cases are in the most economically productive age group. Over 50% of TB case occur among people between 15 and 49 years who mostly live in poor and crowded homes. Timely case detection and prompt treatment initiation are key as PTB+ cases remain the main source of active infection in our communities. TB is a major public health problem in the Horn of Africa with Ethiopia being the most affected where TB cases increase at the rate of 2.6% each year [11, 12]

Ethiopia adopted the internationally recommended TB control strategy, the Directly Observed Treatment Short (DOTS) course, by early 1900s. The major components of this strategy included case detection by sputum smear microscopy and standardized treatment based on TB patient treatment category with active health workers supervision [12]

Despite services and medicines being given free of charge to TB patients and control strategies being in place for over two decades in Ethiopia, the estimated case detection rate of TB remained relatively low, likely indicating under-diagnosis as well as delays in the diagnosis and treatment of TB. That is to say, either the patients fail or delayed to seek health care or the health care system fails to address TB case detection particularly at the community level. These may result in increased costs and disease severity in the individuals, as well as increased morbidity and mortality of TB in the community from increased risk of transmission of TB[4, 13, 14]

Management of TB patients involves early (& accurate) diagnosis and appropriate treatment to reduce transmission, morbidity, mortality and development of drug resistance (Rifampicin resistant TB). Currently, case finding of TB requires that patients are aware of their symptoms and have access to health facilities. Once they come in contact with a health facility, the diagnosis of TB depends on clinical suspicion and subsequent laboratory confirmation which in

turn depends on the type of diagnostics available and the skills of the laboratory personnel. In this complex continuum, anything could go wrong and patients may remain undetected leading to delayed initiation of treatment with high morbidity and mortality as well as continued transmission

Delay in diagnosis and treatment of TB patients could be due to patients' delay in seeking health care, health care providers' delay in making prompt and accurate diagnosis with subsequent initiation of treatment or both. Diagnostic delay has been found to be a major obstacle in the control of TB especially in low income countries. Delayed diagnosis and treatment of TB (TB) results in severe disease and a higher mortality. There is growing evidence that access to treatment remains difficult for a high number of TB cases. It also leads to an increased period of infectivity in the community. Delay in seeking appropriate TB treatment is a challenge in TB control. Despite of deferent TB control program, still there is low case detection rate which leads to delayed presentation to diagnosis and initiation of treatment in the study area. Little work has been carried out to try to solve the stated problem, or that some work has been done but gaps still exit; hence the need to conduct the study[15, 16]**.**

Many studies tried to investigate factors for patient and health service delay. Patient delay was associated with many factors. Diagnostic delays of TB have been investigated in many parts of the world; however, total delays and risk factors for the delay vary significantly from region to region and country to country likely due to differences in culture, environment and infrastructure. On the other hand, a risk factor identified for a delay in one study has no/insignificant association in others. Inconsistencies of magnitude of TB treatment delay in different countries indicate the need for further studies to measure magnitude and explore further determinants. As far as my knowledge is concerned no studies have been conducted to assess TB treatment delay contextual to Hadiya zone health facilities and zonal hospitals including primary hospitals. The reported case detection rates of new pulmonary positive TB in Hadiya zone is 60% and in 2008 E.C. This study will fill gaps of associated factors, which influence TB treatment total delay and can help to show direction to solve problems[17-19]

## 1.3 Significance of the study

Early detection and timely initiation of anti TB drugs are pre-requisites for a successful TB control program. In this regard, early health seeking action from patients' side and prompt diagnosis as well as initiation of treatment from the health system's side essential steps. Delayed diagnosis and treatment of TB (TB) results in, MDR TB, high infection and a higher mortality. It also leads to an increased period in infectivity in the community. Hence this study will be conducted to assessing patient and health system delay in TB treatment for effective implementation of the measures in study areas.

It seems that there is no sufficient knowledge about the social and cultural factors responsible for delay in seeking care for TB patients and patient translate their symptom of illness in different ways. Therefore, the most effective measure to control the epidemic situation of TB is timely diagnosis and complete cure. Determining those factors which influence TB treatment will provide Information useful for designing proper communication messages to encourage symptomatic patients to seek health care early. There is growing evidence that access to treatment remains difficult for a high number of TB patients in study area. The challenge posed by the low case detection rate at study areas can be addressed by studying the TB treatment delay in case finding. Understanding the causes behind the TB treatment delay in seeking TB treatment is essential for all partners involved in TB control in Hosanna district, in order to improve early initiation of anti TB drugs. Therefore, this study will provide:

- ✓ To determine the magnitude of TB treatment delay among TB patients in the study area.
- ✓ Information on regard is useful to determine the existing significant variables related to guide the care services to towards alleviating the problem with timely initiation of anti TB.
- ✓ To fill gaps in this area research by added to existing body knowledge, it helps other researcher as baseline data for work.
- ✓ The study will provide evidence for improving policies and programmers that will help enhance early case detection and treatment.

# Chapter two Literature review

## Overview about TB

TB is continued to be a major global health problem that causes ill-health millions of people each year and the second leading cause of death from infectious disease worldwide. In 2014, there were an estimated 9.6 million new TB cases: 5.4 million among men, 3.2 million among women and 1.0 million among children. There were also 1.5 million TB deaths (1.1 million among HIV-negative people and 0.4 million among HIV-positive people), of which approximately 890 000 were men, 480 000 were women and 140 000 were children. The number of TB deaths is unacceptably high: with a timely diagnosis and correct treatment, almost all people with TB can be cured[20]

World Health Organization (WHO) declared TB as a global public health emergency, in 1993. The global TB strategy were developed by WHO for the period 2006−2015 is the Stop TB Strategy with broad strategy to achieve 2015 global targets for reductions in the burden of disease caused by TB.Despite those stop TB strategy, the global burden of TB remains tremendous, TB cases and mortality are unbearably high given that most deaths are preventable if people can present early at health care for a diagnosis and the correct treatment is provided.[4, 21, 22]

There by studies have identified and documented several factors that are responsible and associated for late presentation and delayed diagnosis as a key problem for TB. Delay in treatment has been categorized as patient's delay which is a time taken by the patient before consulting health facility from the onset of symptoms and health system delay, a time between receiving a patient and final diagnosis of TB and health system delay is time from final diagnosis to initiation of anti TB drugs.

A number of studies demonstrated that the health seeking behavior of patient and the decision to engage with particular medical services are influenced by a variety of socio-cultural influences sex, age, awareness, perceived social stigma, fear, gender differences, family support, distance to the health facilities, poverty. For the purpose of this study literatures were searched and reviewed looking at delay in health seeking.

## 2.2 Factors affect delay in TB treatment among TB patients.

2.2.1 Patient delay

TB represents a classic public health issue, as effective diagnosis, treatment and control are important for the whole of a society. Delay in TB detection and treatment of TB has a negative impact in a community. 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. Delay in TB diagnosis may also lead to a more advanced disease state at presentation, which contributes to late sequel and overall mortality. Smear-positive cases are more likely to infect other individuals. The mean duration between symptoms and varied across countries, being lowest in Pakistan (9.9 days) and highest in Somalia (69 days). By comparison, a mean delay of 3 weeks was seen Botswana [27], while a mean patient delay and 35 of 161.7 was reported from Tanzania, and contributed to more than 90% of the total delay [3, 23, 24]

Crossectional Study conducted in Zimbabwe in 2016, In comparison to patients starting TB treatment at district or mission hospitals, those treatments at rural primary health facilities were more to experience patient delays. The likelihood of delays was higher those took self-medication experiencing cough symptoms[28].

In Ethiopia, according studies have done showed median patient delay 30 days in Amhara and Tigre region[16, 19]and 31 days in Hawassa , SNNPR[25].On the other hand, provider delay in Amhara region found the longest 21 days' days. Whereas study conducted among pastoralists of Somali region of Ethiopia the median delay was found to be 60 days ,provider delay in afar (median, 6 days) and Somali, Ethiopia (median, 6 days [17, 19]

A longer distance from the health level of patients and TB all contributed to this delay. Stigma plays an important role in determining health-seeking behavior suspected of TB as important part in hindering patients from seeking health care. The significant risk factors for patient delay that frequently reported from the studied countries were living in rural areas, inadequate knowledge regarding TB, a high degree of stigma satisfaction with care, seeking health care from a non-specialized individual at symptoms, and seeking care from more than one health care provider. In conclusion, patient delay is mainly dependent upon the health seeking behavior of TB patients

which is mainly determined by their characteristics of stigma felt and knowledge regarding the disease.

Study from Tanzania, showed that visiting several health care providers significantly associated with longer delay. The majority of the patients were satisfied with consultation from one health care provider. Only 1.5% of consulted two health care providers before being referred to a TB center and a mean of 5 health care providers were consulted by each patient, some patients even consulting 2 health care providers. In Tanzania, a longer health care system delay was seen patients, especially in rural areas, consulted traditional healers [26]

According Crossectional Study conducted in Amhara region shows, considering all health providers as a reference point, the median health-seeking period was 15 days IQR (15–21 days). Almost all of the patients had visited a health care provider within one-month time from the onset of their symptoms. Of all the respondents, 61.7% initially visited non-formal health providers (including traditional 27.1%, drug retail 31% and local injectors 3.6%). On the other hand, 38.3% visited the formal medical (posts/clinics 9.4%, health centers 15%, government hospitals 3.9%, and private clinics 9.9%). The decision Friends and health also influenced patients' decision to seek care (11%) .The study suggests TB treatment more delayed in private facilities than public health faculties[15]

Another Study connected in bale zone, about 90% of patients, who delayed seeking health care for more than 14 days, were asked for reasons of their delay, 20.9% of patients delayed assuming that will disappear by itself, while 22.5% delayed because of shortage of money for transportation and care 4% following traditional/ spiritual treatment and 7.8% reasoned that health facilities were too far. Some of them mentioned other reasons, like workload (7.0%), money was not provided on time from family 7%), lack of transportation (7.0%), afraid of long processes in health facilities (2.3%). patients who lived beyond 10 kilometers radius of a health 2.5 times more likely to delay compared to those lived within 10 kilometers radius. Illiterate patients were 2.6 times more likely delay compared to their counter parts. Patients working some times before illness were delay compared to those severely ill. Place of first visit being traditional healer, drug shop, private clinic and health post, were 12 times more likes delay compared to those first visit health center and hospitals(place of diagnosis [27]

2.1.2 Health system delay

Health system delay in our context was the time ranging from patient's first contact to any modern health facility to date of commencement of Anti TB treatment. This comprises time spent during referrals between facilities, diagnosis and time between diagnosis and start of treatment and time spent on treatment of patients with drugs other than that for TB. The last diagnosing facility delay contributed 7.9% to the total health system delay, while days spent after diagnosis (treatment delay) contributed 3.2% to health system delay [34]. As the later did not exceed 4 days in the studied countries (mean ranging between 1.2-4.5days). The mean duration between the first health-seeking behavior and receiving treatment in Iraq, Somalia and Yemen (5–27.6 days), but reached 90.7 (33.5) days in Pakistan. Health system was the main contributor Health system delay was mainly attributed to delayed diagnosis rather than delayed treatment to the total delay in Pakistan, Islamic Republic of Iran and Egypt. A long health care system delay has been also reported from other countries such as Viet Nam (49.7days median health care system delay vs. 21.7 [28]. By contrast, a patient delay has been the major component of delay in countries such as the United States of America (25 days' median patient delay vs. 6 days' median health care system delay

In Pakistan, study showed that visiting several health care providers was significantly associated with longer delay. The majority of the patients Pakistan were not satisfied with consultation from one health care provider. Only 1.5% of consulted two health care providers before being referred to a TB center and a mean of 5 health care providers were consulted by each patient, some patients even consulting 12 health providers. Not only did patients consult several health care providers, but they also contacted or took advice from drug stores. In spite of frequent consultation with local health providers, diagnosis of TB was made by the NTP in 81.3% of cases and the local health care providers made the diagnosis in only 5.7% cases. The factors contributing to this included consultations with individuals other than health care providers (e.g. Traditional healers or pharmacists). These results are in agreement with reports from other countries. In Tanzania, a longer health care system delay was seen when patients, especially in rural areas, consulted traditional healers [26, 29]

In Gambia, patients who initially consulted health care providers had a shorter delay compared to patients who initially consulted alternate healers [30]. In Nepal longer patient delay in omen

was contributed to with traditional healers and more frequent visits to health care providers before final consultation with the NTP. A study from showed that TB patients on an average visited 2.5 doctors before reaching the NTP [31]. Findings from Study conducted in Bangladeshi in 2012 by USAID showed, after diagnosis 96% of patients were initiated on treatment in two days (mean 2.2 days, SD 4.3). Only one patient had a week interval before treatment initiation, and two experienced a month delay[32].

In south India study shows**,** the health system delay was 23 days (range 0–365). Sixty-nine per cent (366/531) of the patients a health system delay of more than 1 week. The health system delay was significantly longer patients first consulted a private practitioner (30 days vs. 7 days), had a shorter duration of cough at the time of first consultation (30 days vs. 10 days) ,this study revealed patients who first consult private practitioners experienced a significantly longer health system delay than patients who first consult governmental health services[33].

The crossectional study was conducted at Bus hullo Major Health Centre, SNNPR, Most of the factors associated with patient delay were economic: cost of transport, prolonged transport time, residence, overnight travel, and the need to sell personal belongings to be able to afford coming to center These factors are indicators of financial stress and underline economic barriers to health care[25].

Study conducted in Bale zone reveled; the median health provider delay was 34 days (range 8–105) days. The main reason for the diagnosis delay were, advice or drug was given rather than anti-TB treatment, lack of reagent and delay of sputum examination in laboratory, and long time to return to health facility. Concerning the place of TB diagnosis 55.8% was confirmed at hospital level, 44.2% were in health centers that were closer to the community. After confirmation of TB median treatment delay observed was 11 days. Forty-seven percent of total delay was contributed by health provider delay. The last facility 17.8% to the total health system delay, while days spent after TB diagnosis contributed 6.3% to system delay this study it was found that there was statistically significant association patients lived in rural area were 2.9 times more likely delayed compared to those who live in urban[27].

### 2.2.3 Knowledge 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 healthcare seeking and adherence to treatment. Studies from Vietnam 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 programmers, and they do not recognize the need for prompt case detection, follow-up and treatment. 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 TB, 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 center. A descriptive crossectional Study conducted in Wolo, northern Ethiopia shows, most patients, however, did not know what caused TB, and only a few cited an infectious agent. In believed TB to be result of everyday life – hard work, cold air and exposure to dust. Renewed required and awareness of TB. Despite these gaps, most people agreed that TB is dangerous (85 percent suggesting that if people knew more about the means of transmission within community, they may be more likely to seek health care sooner [34-36]

2.1.5 Stigma in patient delay

A descriptive crossectional Study conducted in Wolo, northern Ethiopia shows, the stigma associated with TB often treatment. The HIV/AIDS Sub-Saharan Africa has number of problem with TB treatment and the stigma of TB has been heightened by perceived with the pandemic, the two being synonymous for many people. Stigma proved to be a major determinant of health-seeking behavior, where fear of diagnosed with TB and fear of social isolation, were the main obstacles to timely health- behavior in almost all the studied countries. Conversely, it prompted patients to seek timely considerable proportion of patients felt ashamed that they had developed TB, had tried to hide, that TB affected family and marital relations, and work performance. More females said that the chances of a girl getting married were less ifshe has TB [37, 38].

## Conceptual frame work

According to the WHO TB patients who report to health care facilities more than 21 days after onset symptoms are considered to have delayed in seeking treatment. When patients report at a health facility with symptoms suggestive of TB, it is expected that, diagnoses and initiation of treatment are done within two weeks. Considering 7 extra days this was 30 days beyond these time intervals are considered delayed. However, several factors shown in figure 1 affect the timeliness of treatment initiation including; patient level factors, health facility factors and program factors. For the purpose of this study, the focus is on patient and health facility timeliness and the associated factors.

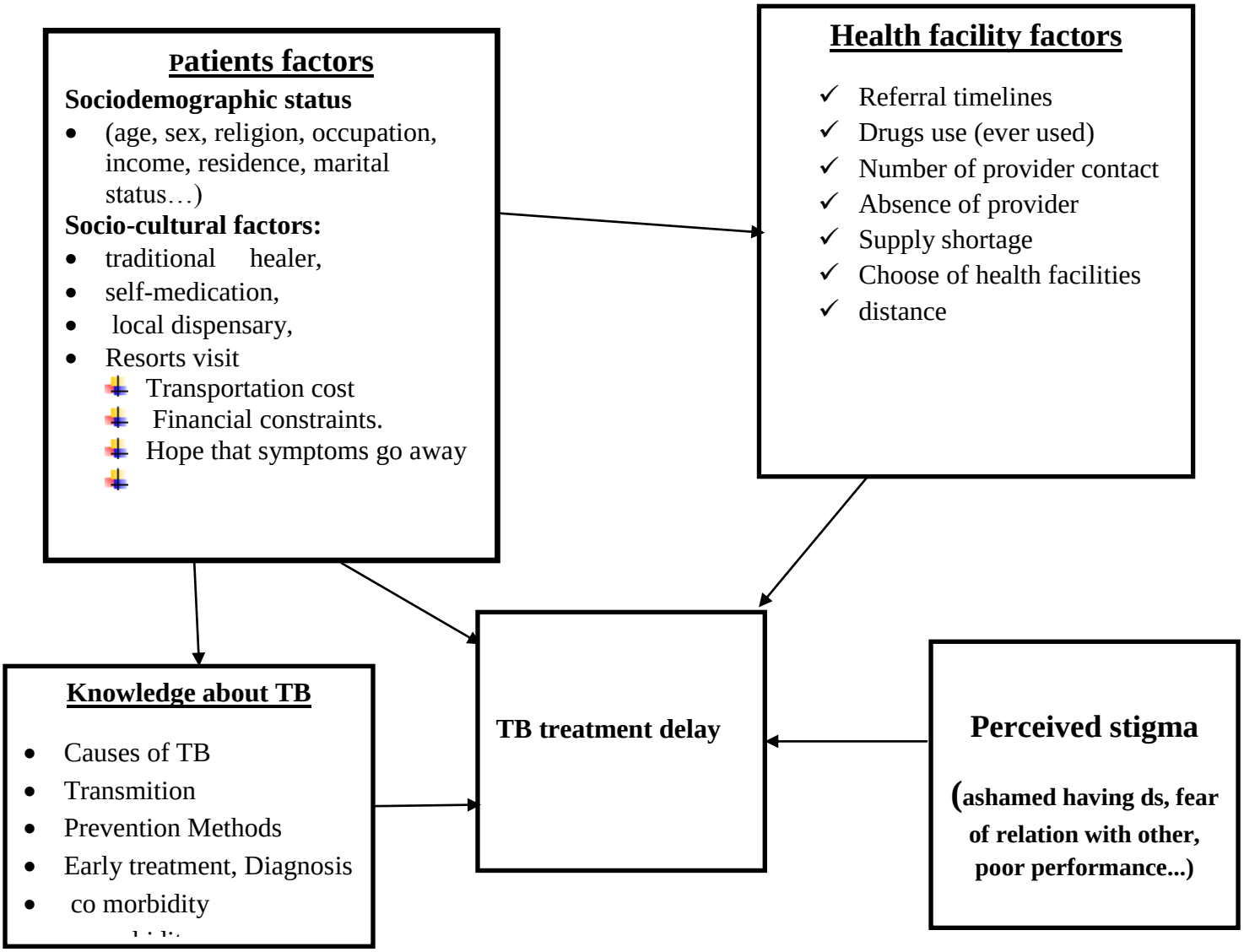


**Figure 1 conceptual frame work which is adapted from literature review of TB treatment delay and associated factors among PTB Hadiya zone health facilities ,SNNPR,2017**

# Chapter Three Objectives of the study

## General objective:

- To determine tuberculosis treatment delay and its associated factors among pulmonary tuberculosis patients at Hadiya zone health facilities, SNNPR by 2017.

## Specific objectives:

- To determine the magnitude of Tuberculosis treatment delay among Pulmonary Tuberculosis patients.
- To assess the sociodemographic factors of contributing to the tuberculosis treatment delay among Pulmonary tuberculosis patients.
- To determine health system factors influencing tuberculosis treatment delay among Pulmonary tuberculosis patients.
- To assess the perceived stigma affecting tuberculosis treatment among pulmonary tuberculosis patients.

# CHAPTER FOUR METHDS AND MATERIALS

## 4.1 Study area and period

The study was conducted in Hadiya zone, which is divided in to 10 rural Woreda and two administrative towns with total of 329kebeles which are 303 of them rural and 26 of them are urban. Hadiya zone hosts a total of 1,573,841populations with a total area of 3542.66 Sq. Km. In the Zone, TB prevalence rate is 58%. Currently, health care provision within the zone is carried out through 61 health centers, 309 health posts, and 3 public hospitals. There were 131 different privately owned clinics that also rendered health services to the community(38). The study was conducted from March 1, 2017 to April 1, 2017.

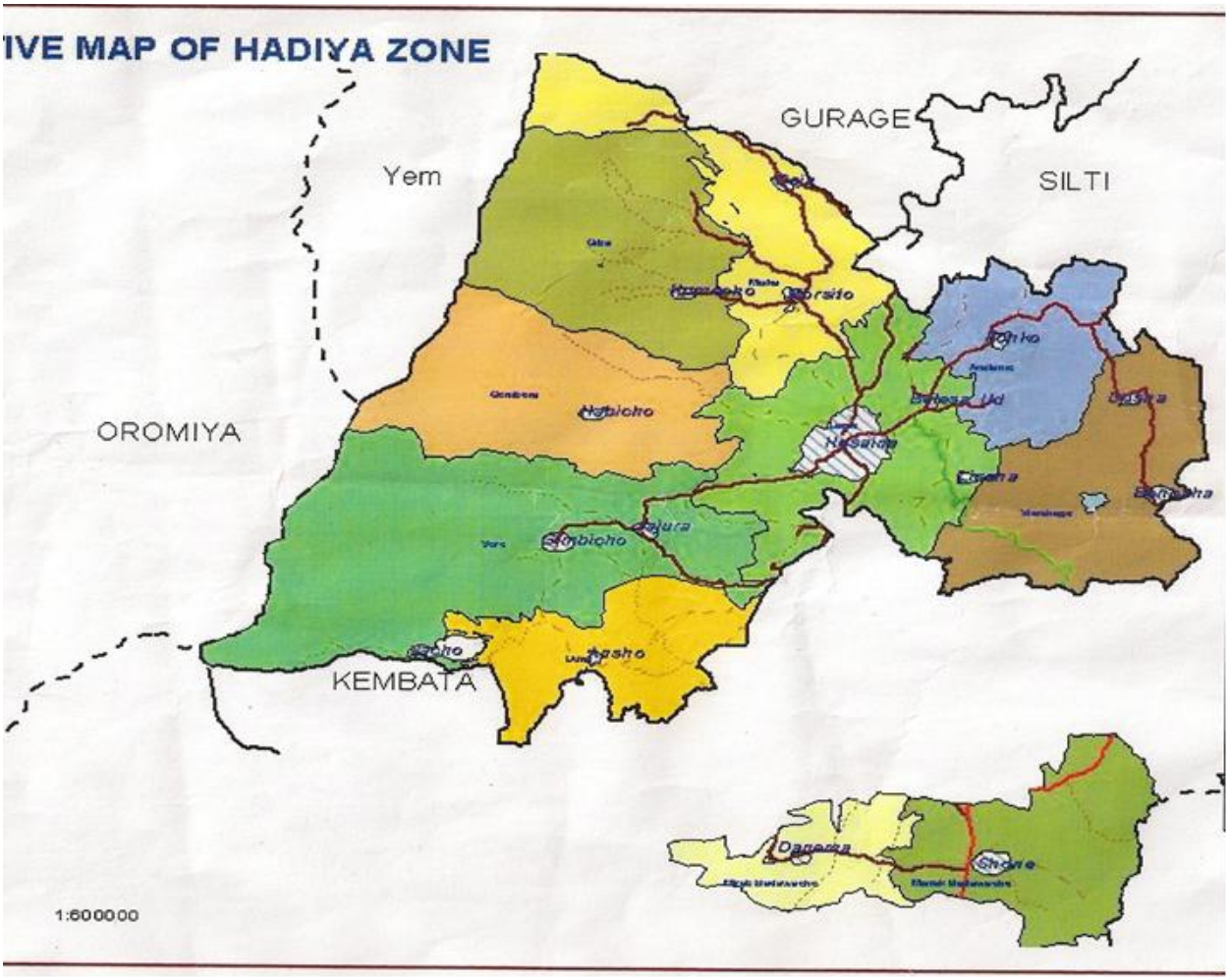


**Figure 2:Locational map of Hadiya zone of the area(source : Hadiya zone administration office 2008 E.C)**

## 4.2 Study Design

A Facility based cross-sectional study to investigate factors influencing tuberculosis treatment delays in seeking tuberculosis treatment was employed.

## 4.3 Population

4.3.1 Source population:

All pulmonary tuberculosis patients who were on DOTS treatment and attending government health facilities in the study period.

4.3.2 Study population

All sampled PTB patients registered in NTLP in selected health facilities who were on DOTS, during their intensive phase of treatment was considered as the study population.

4.3.3 Inclusion and exclusion criteria

**4.3.3.1 Inclusion criteria:**

- Patients with proven PTB cases who are on DOTS program.
- PTB patients aged 18 years and above.

4.3.3.2 Exclusion criteria

- Patients who defaulted before the date of data collection.
- Patients who are severely ill and cannot communicate during data collection.
- Extra pulmonary Tuberculosis patients.
- Those diagnosed in other health facilities were not included and transfer out patients before data collection will start.
- MDR Tuberculosis patients

## 4.4 Sample size determination and sampling techniques.

4.4.1 Sample size determination

All sampled Pulmonary Tuberculosis patients who are on DOTS program, during data collection period that full fill the inclusion criteria were included in study

.

4.4.2 Sample size calculation

The required sample size was calculated using the formula required for determination of sample size for estimating single population proportions. Three variables (patient delay, Health system delay and treatment delay) was compared, to take representative sample. Therefore,

1. By taking a previous study done on TB treatment delay which is 58% inEthiopia[25] n=373

2. patient delay more than 30 days in Amhara region is 48%[18] ,n=383

3. Study conducted in Oromia region, Arsi 49.7% of patients experiences health system delay [5] n=383. Final sample size is taken based on patient delay variable which is 383 and adding non response rate of 10% final sample calculated is 418. Then using the formula for single population calculation:

$$\mathbf{n= (z\ \alpha/2)^2 * p\ (1-p)/d^2}$$

Where, n =is sample size'

z=95% confidence interval

d=is bond on sampling error tolerated sample and population's%

α=critical value at 95% confidence interval of certainty (1.96).

Since the expected total number of all form TB cases in the study area is less than 10,000 or n/N is > 0.05, we use correction formula. Then the final sample size was:

$$\mathbf{n\ f} = \frac{\mathbf{383}}{(1+ (383/1200)}$$

$n_{\mathbf{final}}$=294+10% (non-response rate)

$\mathbf{n}_{\mathbf{final}}$=299+38=347

4.4.3 A Sampling techniques.

Hadiya Zone had rural districts (ten in number) and town administrations (two in number, Hosanna and Shone). Then three woreda were selected by simple random sampling from the ten districts. Whereas, one town administration was included randomly from urban. simple random sampling technique was used to identify study health facilities to be enrolled for the study. All study facilities were selected proportionally based on the size of the tuberculosis cases per each facility. The sample size was proportionally allocated to each of study health facilities (Hosanna HC=40, Bobicho HC=30, General hospital=80, Homacho district hospital=60, omocora HC=40, Shone primary hospital=55, Korega HC=35) based on number of tuberculosis case in each health facility. Finally, DOTS User at the beginning of data collection was consecutively recruited provided that non double count in to the study until the intended 347 sample size fulfilled and interviewed in nearby facilities by using health professionals.

4.4.3 Sampling techniques of Qualitative Study

Purposive sampling was used conveniently to select participants for the in-depth interview to reflect TB treatment delay. To ensure reasonable spread, range of participants with respect to age, sex, and residence. Health workers working on the area (TB clinic, laboratory room, TB patients and mangers were taken for in-depth interview in Hadiya zone health facilities. And a minimum of 16 participants, 4 health managers, 6 TB patients and 6 health professionals were selected.

## Trustworthiness and dependability

Trustworthiness (Quality) was ensured and considered the following issues:

**1. Sample and context** sampling from different contexts increases Conformability, transferability

**2. Data collection** often for credibility, dependability**3. Data analysis** (organizing, coding/reduction, searching, and modeling and interpretation) [show credibility, conformability, dependability, transferability]. **Creditability**: was ensured (established) by match between the constructed realities of respondents and those realities represented by the researcher. **Transferability:** A response from one respondent was checked if it similar with respondent with other contexts. Diversity of respondents has great importance for transferability; stillcontexts needs to be noted throughout (ideas were exhaustively explored)**For repeatability**; peer debriefing, summary report read by key informants/respondents

**Confirmability**of qualitative data and the interpretations drawn from it are rooted in circumstances and conditions *outside from researchers' own imagination and coherently and logically assembled.*

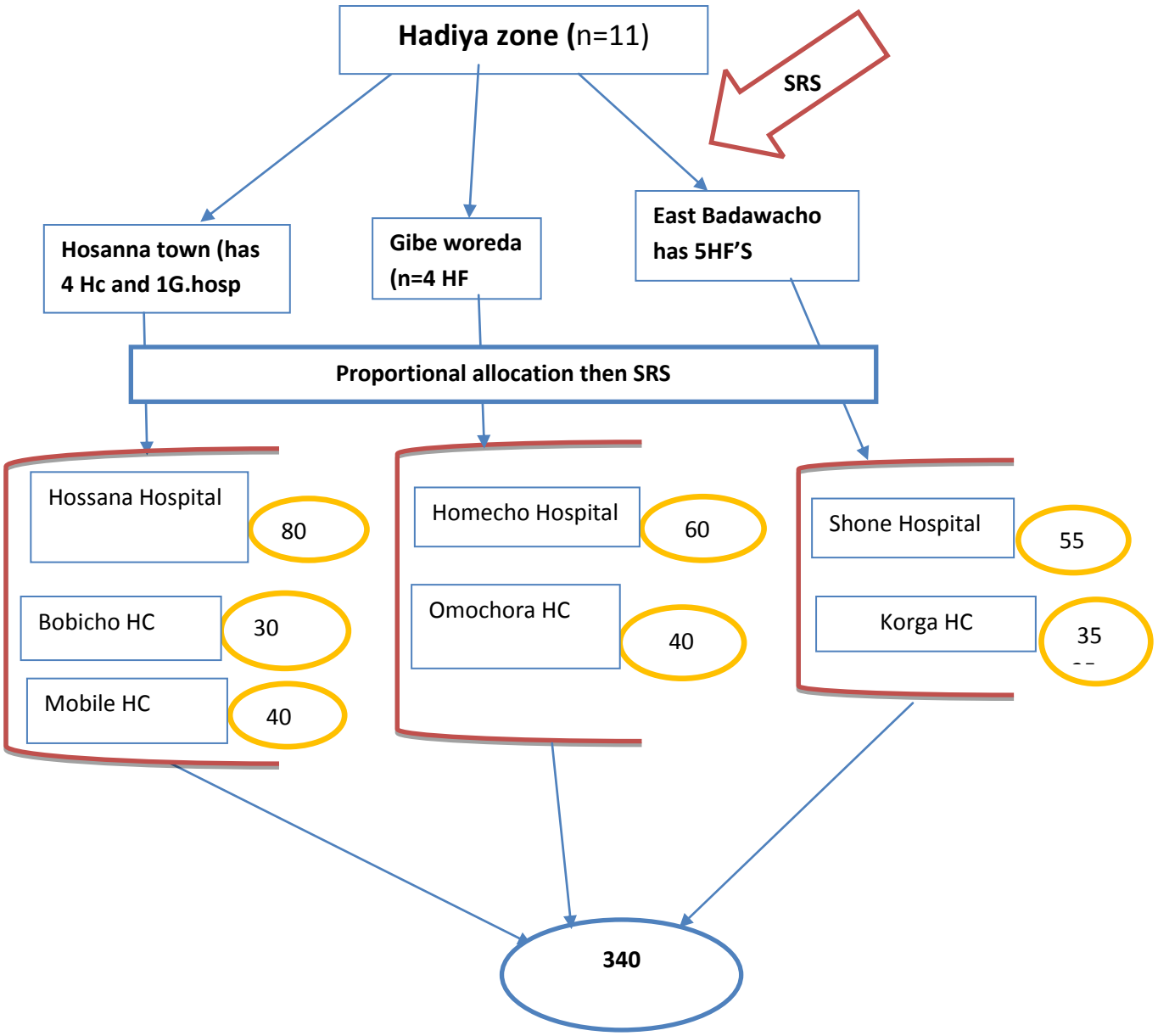


Figure 3: Schematic Representation of Sampling procedure

**4.5 Data collection tool and procedure**

The questioner was initially being prepared in English and two individuals translated into Amharic and Hadiya local language, then the final Version of the Amharic questionnaire was again translated into English by another person to check the consistency. A pre-tested structured questionnaire was administered to collect the intended data. Questions assessed, socio-demographics, major presenting symptoms of PTB, duration of major presenting symptoms and the date of first health care visit for each enrollee, Questions regarding knowledge of TB and perceived stigma was also included. With the permission of health workers at the DOTS clinic, patients coming to the centers for their treatment under DOTS was requested for consent and then interviewed for the required information. Information like date treatment started was recorded from the TB registers, lab register and TB treatment cards were cheeked to assure quality of data. Six Health professionals working in the study area interviewed the subjects after five minute following the TB treatment.

Two supervisors (health officers by qualification) responsible for discussing the purpose of the study, distributing questionnaires, telling to the participants the importance of honest and sincere replay and responding to questions raised during filling the format. The questionnaire prepared to measure perceived stigma and knowledge were checked for their internal items consistency, the inter item reliability Cronbach alpha=0.8 and 0.73 respectively.

**For qualitative**: Interviews with TB patients, health office and district hospitals heads and health professionals were carried out independently by using in-depth interview guides which was prepared separately for patients and health professionals. The key personnel such as, the TB focal and LAB professionals was involved in the in- depth interview. The principal investigator conducts the in-depth interview using a simple checklist of questions to be covered to collect the suggestions of the participants. The interview with mangers and health professionals, different patients carried out until no newly emerging ideas emerged. The points were manually written by both the principal investigator and one other note taker. For In-depth Interviews the questions were similarly translated into the local language, Hadiyigna and Amharic like that of the standard and structured questionnaire.

## 4.6 Data Quality control

The questionnaire used pre-tested on out of study area (Fonko health center). The questionnaires were pre tested at 5% of sample before starting the actual data collection outside study area for its clarity, understandability, completeness, reliability, consistency and the necessary modification were made on the tool accordingly. Two Supervisors who is experts from the Town Health office were trained for two days on the overall procedure of data collection system and the general objectives of the study and supervision process. Six Data collector trained who are health professionals for two days and supervised during data collection. Duration of symptoms, date of initiation of treatment were counter checked in the medical records. Data was double entered into a computer, and the two copies of the data verified using Epi data v-3. Finally, the principal investigator and supervisor checked for its completeness.

## 3.7 Validity and Reliability

To ensure the validity of the study maintained, relevant literature was reviewed and opinions from the experts in the concerned field of TB research was obtained. reliability of some items and its constructs was computed and checked at Cronbach's alpha of 0.835 for perceived stigma questionnaire which is acceptable tool to measure the constructs.

## 4.8 Data management and analysis

Data was entered into computer using Epi-data software version 3.1 and exported to SPSS software version 21 for analysis. Descriptive statistics was computed, such as frequency distributions, median, proportion and interquartile ranges (IQRs). Bivariate analysis was performed between independent and outcome variable to select candidate variables at $p<0.25$. Multivariate analysis was used to explore the predictors of the outcome variable (TB treatment delay). Unacceptable TB treatment delay, was compared for different sub-groups using prevalence ratios and 95% CI. To identify factors independently associated with outcome variable, a multivariate analysis with delay time was dichotomized. Possible predictors were tested in bivariate associations with outcome variable (TB treatment delay). Multiple logistic regressions were tested for possible predictor's variable to identify factor associated with TB treatment delay and to control for potential confounders. Statistical significance was taken as $p < 0.05$.Presence of statistical association between variables was observed by cross-tabulation using **Pearson-$\chi$2 & Fisher exact tests** &candidate variables with $P< 0.25$ were included into

Multivariate Logistic Regression.Model for adjustment & model adequacy was checked by **Hosmer & Lemeshow-GOF-test at p-value >0.05.**

**Qualitative Study Analysis**

Verbal or written consent was obtained from all participants and they were informed that they could refuse participation or withdraw from the interviews at any time. to enable a deeper probing into certain areas, six health professionals working at TB units, six in a leading position and four TB patients were interviewed in-depth individually. The in-depth interviews were made in the offices of the respective professionals in the various districts. The interviews lasted about 1 hr, each. All interviews were tape recorded, translated verbally into English and transcribed by principal investigator. The in-depth interviews were transcribed into English together with the moderators to allow for more thorough interpretations of the answers. All transcripts were cross-checked by the moderator. Interviews were regularly transcribed the same day or the following morning. The interview process was finished when the team considered that data saturation had been achieved (no new emerging ideas). Finally, information was linked to its congruence with data obtained from quantitative findings.

## 4.9 Study Variables

4.9.1 **Dependent variable**: outcome variable of interest

Tuberculosis treatment delay

4.9.2. Independent variables.

Patient's variables

- Socio demographic variables (Age, sex, religion, marital status, educational status, Ethnicity, income and occupation)
- Knowledge about TB Disease (about causes, transmutation,prevention methods, drugs, diagnosis)
- Perceived Stigma toward tuberculosis treatment.
- Self-medication(treatment) or alternative option to private facilities**.**
- Transportation cost for health care, Resorts visit&financial constraints.

**Health facility variables**

- Shortage of anti TB drugs in facilities or TB clinic.
- Lengthy referral between care provider and health facilities.
- Distance to nearby government health facilities.
- If ever tried(used) drugs and not cured (prolonged Antibiotics treatment)
- Choose(preference) to health facility
- Multiple provider contact
- Absence provider

## 4.10 Operational definitions

**Patient delay** is defined as the time interval between the onset of the first TB symptoms and first contact with Public health services (health centers, hospitals TB treatment centers) because of those symptoms. Presentation to health facilities from onset of TB symptoms >30 days was used as cut of points, Respondents presented more than this day referred as a patient delayotherwisenot delay[5, 19, 39]

**Healthcare system delay** defined as the time interval between Laboratory diagnose of TB to initiation of anti TB drugs. respondents presented more than five days considered as prolonged health facility delay(WHO,2012). In this study Health system delay includes diagnostic and TB treatment delay only[5, 40]

**Total delay** is defined as time interval between the first TB symptoms and initiation of TB drugs (which is equal to the sum of patient and Healthcare system delay). Since factors for TB treatment delay was either side (patient or health system) identified and analyzed separately for intervention purpose, Finally the two delay (patient and health facility) checked together.

**Perceived Stigma**: Likert scale was used to measure perceived stigma of the patients, which ranges from 1 being lowest degree of stigma to 5 highest degree of stigma. The type of stigma is internal. The summed total was calculated for each respondent's response, the mean score was calculated which was 24.53(minimum score was 9 and maximum was 45) and based mean score, after checking the normality of summed which was close and suggesting normally distributed, based on mean score value, those with a score of less than mean score were categorized as as experienced no/mild stigma, and those mean score greater than were categorized as experienced high stigma[5]

**Knowledge about TB**: It will be assessed by asking nine yes/no type fundamental questions about cause, important symptoms, and mode of transmission, diagnosis, and treatment of TB. By taking the median of total summed score,who score above median taken as have good knowledge otherwise poor[5]

In this study TB confirmed case includes PTB- &PTB+

## Definition of terms

**New TB patient** refers to a patient who has never had treatment for TB or who has taken ant TB drugs for less than one month. Pulmonary TB refers to a patient with TB disease involving the lung parenchyma.

**Smear positive** PTB refers to a patient with at least one sputum smear positive for acid fast bacilli (AFB), or one sputum smear positive for AFB plus radiographic abnormalities consistent with active pulmonary TB; or one sputum specimen positive for AFB plus culture specimen positive for Mycobacterium TB.

**Smear negative PTB** refers to a patient with two negative sputum smears for AFB and radiological abnormality consistent with active TB or failure to respond to or one which health worker or clinician has diagnosed TB and decided to treat the patient with full course of anti TB drugs.

**TB symptom onset:** The time at which the first symptom patient experienced include Cough and other constitutional symptoms like fever or night sweating, weakness, homeostasis and weight loss or chest pain for which a patient's health care seeking began considered as TB symptoms[46].

**Extra pulmonary TB**: refers to patients with TB in any organ other than the lungs verified by histopathology.

**Alternative care providers**: These include traditional health providers, local injectors and drug retail outlets.

Antibiotics drug use other than anti TB is chemotherapy which given during TB case detection before anti TB drugs.

**Multiple Healthcare contacts** defined as making more than one visit to any Public Health facility before diagnosis.

**Prolonged referral** defined as when TB patients didn't get required services within optimal time according to BPR standards. This might be either between provider or provider and health facilities. Which is greater 30-60 minute during health care services?

Accessibility **(**distance): It is the distance from the original residence /home of the study subjects to the current DOTS center. It was measured by asking study subjects about how many times in minute or the Distance in KM taken from home to the treatment center for the first time when they started the TB treatment. Those HF with in 10 KM are accessible otherwise distant to patients (WHO)

**Self-treatment**: Any kind of self-prescribed treatmenttaken by patients for their illness.

## 4.11 Ethical considerations

The study was obtained ethical clearance from ethical review board of Jimma University, institute of health. Thesis proposal reviewed and approved by ethical clearance committee. Permission letter obtained from Hadiya zone health department, Hosanna health town office and district hospitals after discussion of the purpose of the study. Similarly, after clear discussion about the actual study verbal and written informed consent was obtained from each study subjects while the study subjects right to refuse was also respected. Confidentiality and privacy secured.

## 4.12 Dissemination plan and communication of findings

The final result of this study will be presented and submitted to Jimma University, institute of health science, department of Health Education and Behavioral Science. It will also have disseminated to zonal health department, SNNPR health bureau, woreda health office, participated health facilities and other concerned governmental and nongovernmental organization. In addition, the finding will be presented in different scientific conferences, seminar and workshops and it will be attempted to publish with scientific peer reviewed national and international journals.

# CHAPTER FIVE RESULT

Result of Socio-demographic characteristics of participant:

Three hundred and Forty PTB patients with a response rate of 97.7% were enrolled from seven diagnostics and treatment centers. seven were excluded (Five were diagnosed in other health facilities outside study facility and two severely ill) during study period. The median age was 34 (IQR=23-42). Based on their residence 26% of the participants resides in urban ,17% semi urban and 57% ruler areas and of which 87% settled within 10 km from public health facilities with a median of 3 km. With regard to education 58% were unable to read and write, 11.2% were primary school and 20.2% are high school and 10.6% college and above. The respondent's income distribution showed that 61.4% had an income of below 500ETB per month. The average monthly income was 452ETB(1USD=22ETB) summarized in table 1 below.

**Table 1: Selected socio demographic characteristics of the respondents' among pulmonary tuberculosis at Hadiya zone health facilities, SNNPR, 2017(n=340).**

| Variables | Frequency | Percent |
|---|---|---|
| Sex of the respondents | | |
| **Male** | 173 | 50.9 |
| **Female** | 167 | 49.1 |
| Age of the respondents | | |
| 18-24 years | 109 | 32.4 |
| 25-34 year | 110 | 32 |
| 35-44 year | 68 | 20 |
| >=45 years | 53 | 15.6 |
| **Marital status** | | |
| Single | 108 | 66.2 |
| Married | 225 | 31.8 |
| Divorced | 7 | 2.1 |
| **Educational status** | | |
| Unable to read and write | 192 | 56.4 |
| Primary school | 47 | 13.8 |

| | | |
|---|---|---|
| High school | 67 | 20.2 |
| College and above | 35 | 10.6 |
| **Religion** | | |
| Protestant | 210 | 61.9 |
| Orthodox | 105 | 30.9 |
| Muslim | 25 | 7.4 |
| **Ethnicity** | | |
| Hadiya | 244 | 71.8 |
| Gurage | 67 | 19.7 |
| Amhara | 12 | 3.5 |
| Kembata | 27 | 7.9 |
| Estimated Income in ETB | | |
| 0-500ETB/month | 178 | 52.4 |
| 501-1000 ETB/month | 75 | 22.1 |
| >=1000 ETB/month | 87 | 25.5 |
| **Occupation** | | |
| Farmer | 69 | 20.5 |
| Merchant | 99 | 29.5 |
| Non employed | 56 | 20.5 |
| Employed | 69 | 16.5 |
| Housewife | 34 | 10.1 |
| Students | 13 | 3.8 |

ETB=Ethiopian birr.

## Forms of TB and symptoms reported Regarding the forms of TB

The major symptoms that patients experienced during the onset of their illness included, cough (82%), followed by bloody cough (64.5%),chest pain (64%),Breathlessness (61%),fever (58%), fatigue (48.8), loss of weight (44.4%) and loss of appetite (38.2%).

Two hundred and fifty-one (73%) of the respondents were sputum smear positive and the remaining were sputum smear negative pulmonary cases. Nearly two third of the respondents (60%) had poor knowledge of the causes, symptoms, and transmission of TB. Regarding the level of stigma associated with TB, 43% of the respondents stigmatized high or stigma on TB. About half, of the respondents visited a modern health facilities after the illness worsened. 233 (68%) of the patients diagnosed in public hospital and 107(34%) were examined in public health centers.

**Reason for TB treatment delay**:

Those respondents who delayed more than 30 days, to suspect TB and for this study, were asked for the reason, one hundred forty eight (43.5% )of respondents were hoped the symptoms go away by themselves ,103(30.3%) fear the diagnosis , 83(23.9%) due to financial constraints, 49(14.7%) due to visiting some resort sites, that they are not delayed and have no transportation money to visit health Facilities , 6(2%) due toperceived poor health services and they prefer private facilities(2.5%) fear social isolation in the community (Figure 2).

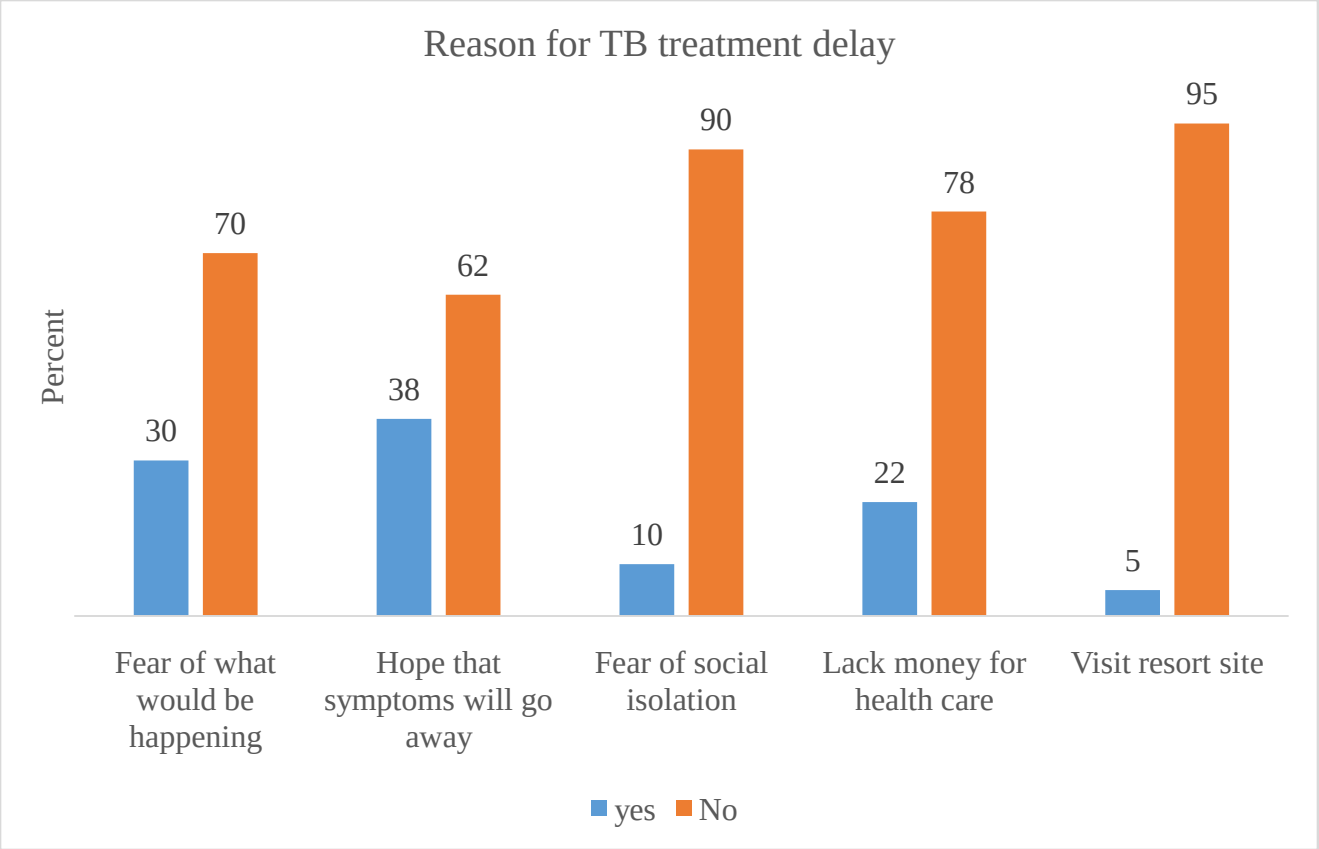


**Table 2: The reason for tuberculosis treatment delay of respondents among pulmonary tuberculosis at Hadiya zone public health facilities, SNNPR by 2017.**

**Table 3: Socio-demographic and Tuberculosis treatment delay among Pulmonary tuberculosis patients, Hadiya zone public health facilities, SNNPR by 2017 (n=340)**

| Characteristics | Number(n, %) | Patient delay(n, %) | ) |
|---|---|---|---|
| **AGE** | | >30 days (Delayed) | <=30 days ( Not delayed) |
| 18-24 years | 109(32%) | 52(15.3%) | 57(16.8%) |
| 25-34 years | 110(32.4%) | 50(14.7%) | 60(17.8%) |
| 35-49 years | 68(20%) | 33(9.7%) | 35(10.3%) |
| >50 years | 53(15.5%) | 34(10%) | 19(5.6%) |
| **Sex** | | | |
| Male | 173(50.9%) | 83(24.4%) | 90((26.5%) |
| Female | 167(49.1) | 86(25.3%) | 81(23.8%) |
| **Marital status** | | | |
| Single | 108(31.8%) | 53 (15.6%) | 55(16.2%) |
| Married | 225(66.2%) | 109(32.1%) | 116 |
| Divorce | 7(2.1%) | 7(2.1%) | 4 |
| **OCCUPATION** | | | |
| Peasant | 69(20.5%) | 38(11.3%) | 31(9.2%) |
| Merchant | 99(29.5%) | 42(12.5%) | 5717%) |
| Non employed | 56(16.7%) | 38(11.3%) | 18(5.4%) |
| Employed | 22(20.5%) | 22(6.5%) | 47(14%) |
| House wife | 34(10%) | 21(6.3%) | 13(3.9%) |
| **EDUCATION** | | | |
| Illiterate | 192(58.4%) | 127(39%) | 64(17.6%) |
| Primary | 47(14%) | 10(6.5%) | 27(16.5%) |
| High school | 67(20%) | 20(12.5%) | 47(28.7%) |
| College | 35(10.6%) | 9(5.4%) | 26(15.9%) |
| **Ethnicity** | | | |
| Hadiya | 244(71.8%) | 121(35.6%) | 123(36.2%) |
| Gurage | 67(19.7%) | 31(9.1) | 36(10.6%) |
| Kembata | 21(6.2%) | 13(3.8) | 8(2.4%) |
| Amhara | 7(2.1%) | 4(1.2) | 3(0.9%) |
| Other | 1(0.3%) | 1(0.6%) | 0(0.0%) |

**Table 4: Tuberculosis treatment delay and heath seeking behavior of the respondent among PTB at Hadiya zone health facilities, SNNPR 2017**

| *Variables* | *Patient delay(n,%)* | |
|---|---|---|
| | >30 days | 30 days |
| ***Type of Pulmonary TB*** | | |
| *Positive* | 200(75) | 76(25) |
| *Negative* | 129(51) | 123(49) |
| *Perceived causes of delay* | | |
| *Hoped Symptoms go away* | 104(148) | 44(148) |
| *Fear of diagnosis* | 97(237) | 140(237) |
| *Visiting resorts* | 22(49) | 27(49) |
| *Fear of social isolation* | | |
| *Constraints of transportation cost.* | 54(82) | 28(82) |
| *Perceived stigma about TB* | | |
| *Low* | 86(142) | 56(142) |
| *High* | 83(198) | 115(198) |
| *Knowledge about TB* | | |
| *Good* | 38(134) | 96(134) |
| *Poor* | 131(206) | 75(206) |

## Perceived stigma

Stigma scores: patients were asked to rate (using Likert-scale) their responses to the following nine questions: feeling ashamed, feeling of hiding the disease, feeling that TB affects relation with others and preference of feeling isolated and other items as shown below table 5. The responses were coded as 1 = strongly disagree, 2 = disagree, 3 = neutral ,4= agree, 5=strongly agree. The summed total was calculated for each respondent's response, the mean score was calculated which was 24.53(minimum score was 9 and maximum was 45) and based mean score, after checking the normality of summed which was close and suggesting normally distributed, based on mean score value, those with a score of less than mean score were categorized as as no/mild stigma, and those mean score greater than were categorized as experienced high stigma. One hundred and ninety (58) %) had low stigma and 199(42%) reported high stigma towards TB and delayed in seeking, TB treatment for more than 30 days since the onset of TB symptoms,

The scale used to measure Stigma, is internally consistent (alpha=0.84). All items(nine) appeared to be worthy of retention; the greatest increase in alpha would come from deleting item number 1 (I am ashamed of having TB) but the deletion of this item would increase alpha only by 0.003. nine items which measure stigma are corrected with the total scale to good degree. The stigma questionnaires are reliable and acceptable at Cronbach's alpha=0.835.The majority (66%)of respondents believed that TB disease affect relation with other, 56% of respondents felt that Ashamed of having TB disease ,66% of respondent were perceived that TB patients prefer to live isolated to other people.

**Table 5: Perceived stigma of Respondents of Pulmonary tuberculosis at Hadiya zone public health facilities, SNNPR,2017**

| Perceived Stigma items(n=9) | Above mean (experienced stigma) | Below mean(didn't experienced stigma) |
|---|---|---|
| **I am ashamed of having TB disease.** | 190(56%) | 148(44%) |
| **Having diagnosed to TB I have to hide other people** | 142(42%) | 198(58%) |
| **TB diseases affect relation with other people.** | 225(66%) | 115(34%) |
| **TB disease is very costly due to its long duration of treatment** | 138(41%) | 202(59%) |
| **I prefer to live isolated since diagnosed to TB disease** | 203(60%) | 137(40%) |
| **TB diseases can affect work performance** | 135(40%) | 205(60%) |
| **TB disease can affect family relation.** | 138(40.6% | 202(59.4) |
| **TB disease is poverty disease** | 135(40%) | 205(60%) |
| **Having diagnosed to TB, I feel inferiority complex to my family** | 135(39.6%) | 205(59.4%) |

*Finding from Qualitative study showed, a33 year, female key informants, states "When men get sick they get support from all family members like the in-laws and others. He gets support all the time from the family, they take care of him. But if the woman gets sick, as long as she can move she still has to do everything herself. The other women age 42 support this ideas, Women are always busy with something so they don't think about themselves, they think about others. Men are quicker than women to seek care and find out about the disease. Women are busy with the family and may think it is of no importance, they always come late.*

**Knowledge about tuberculosis**

Most of the respondents were not aware of the causes of TB. Only 41.7% of the patients however had knowledge about the TB infection causing micro-organismmost of the patients (56%), understood that TB is transmitted mainly through airdroplets resulting from coughing by a TB patient while 22% believed that TBinfection is through punishment and 18% is unavoidable. Majority (68%) of the patients had said that TB can be diagnosed by sputum examination followed by chest x-ray (56%) and some patients recognizing signs and symptoms, while the remainder had no knowledge about the causes. Most of the patients did not know about the correct prevention of TB as shown below. Regarding the overall knowledge of participants on the causes, transmition, prevention, treatment and outcome of TB, 60.4 % of participants had poor knowledge and remaining had good knowledge

**Table 6: Knowledge on TB among PTB patients at Hadiya zone health facilities, SNNPR, 2017**

| **Items** | **Knowledge(%)** | |
|---|---|---|
| | Yes | No |
| Do you know what TB(samba nekarissa) is? | 57.6 | 42.4 |
| TB (samba nekarissa) is a serious disease | 48 | 52 |
| What in your opinion cause TB? | 54.4 | 45.6 |
| What are the symptoms of someone infected with TB? | 61 | 39 |
| How can a person get infected (Transmission) | 55.6 | 44.4 |
| Do you know how TB is diagnosed? | 51 | 49% |
| TB will require a longer treatment to be cured after treatment | 55 | 45 |
| TB treatment and diagnosis is free of charge | 45 | 55 |
| Tuberculosis disease is killer disease | 38 | 62 |
| TB affect HIV/AIDS prognosis | 55.6 | 44.4 |
| Do you have opinion TB prevention methods | 54.1 | 45.9 |
| What are TB prevention Methods | 51 | 49 |
| TB disease is poverty disease | 39.7 | 60.3 |

## Patient factors and tuberculosis treatment delay

Nearly half (49.1%) had sought care in the public health facilities after 30 days of onset of symptoms. The median patient delay was 31 (IQR 28-32). The longest patient delay was 120 recorded were among patients who had practicing traditional healer.

Binary logistics regression analysis through backward likelihood ratio methods employed to assess the relative effect of the explanatory variables on the dependent variable after checking Bivariate analysis. Onthe Bivariate analysis of socio-demographic factors unable to read and write and primary school had a significant increase the risk of delay in seeking health care of TB treatments. Respondents with poor knowledge about TB, and those with prior attendance at traditional healers, self-medication, nearby dispensary local pharmacy and financial constraints were associated with patient delay in seeking health care of TB treatment and the rest explanatory variables didn't selected as candidate for multivariable analysis at p-value =0.25 as shown in the (Table 5)

**Table-5 Summary of Bi-variate and Multivariate analysis of factors associated with delay in seeking health care among Pulmonary TB patients at Hadiya Zone, SNNPR, 2017**

| Variables | **Patient delay >30 days** | **Patient delay <30 days** | COR(95% CI) | AOR(95% CI) | p-value |
|---|---|---|---|---|---|
| **Education Status** | | | | | |
| Unable to read and write | 168 | 68 | **5.7(2.57 12.95)** | **6(3.11 21.36)** | **0.001** |
| Primary | 22 | 10 | 1.07(0.35 3.05) | 1.76(0.53 5.84) | 0.350 |
| High school | 56 | 32 | 1.2(0.487 3.08) | 1.861(0.586 4.82) | 0.334 |
| College and above | 23 | 10 | 1 | 1 | |
| **Knowledge** | | | | | |
| Poor | 131 | 75 | **4.4(2.676 6.815)** | **4(2.283 6.863)** | **0.001** |
| Good | 38 | 96 | 1 | 1 | |
| **Informal treatment sources** | | | | | |
| Traditional healers (Yes) | 81 | 68 | **1.39(0.90 2.14** | **1.23(1.11 3.94)** | **0.022** |
| NO | 88 | 103 | 1 | 1 | |
| Pharmacy shop dispensary (Yes) | 56 | 39 | **1.66(1.03 2.71)** | **2(1.01 4.05)** | **0.049** |
| NO | 113 | 132 | 1 | 1 | 1:00 |
| Self-medication (Yes) | 75 | 42 | **3.4(2.124 5.65** | **2.12(1.14 3.93)** | **0.017** |
| NO | 66 | 127 | 1 | 1 | |
| Resorts visit (Yes) | 22 | 32 | 0.67(0.431 1.45) | 0.84(0.37 1.89) | 0.681 |
| No | 147 | 143 | 1:00 | 1;00 | |
| Financial constraints(Yes | 54 | 28 | **2.3(1.41 3..99** | **2(1.110 3.96)** | **0.022** |
| No | 116 | 142 | 1 | 1 | |
| **Residence** | | | | | |
| Rural | 106 | 90 | 0.5(0.30 0.85) | 0.44(0.23 0.83) | 0.784 |
| Urban | 34 | 56 | 0.9 | 1.078(0.514 2.263 | 0.842 |
| Semi urban | 29 | 25 | 1 | 1 | |
| **Walking distance** | | | | | |
| >10KM | 14 | 30 | 2.4(1.23 4.75) | 1.39(0.76 2.52) | 0.279 |
| <10 km | 157 | 139 | 1 | 1 | |

The predictive ability of the model tested with the goodness of fit with Hosmer-Leme show test; at a p-value of 0.737 suggesting non-significant discrepancy between the observed and predicted scores and model specification of fitness was checked.

On multivariable Logistics analysis, being unable to read and write were associated with patient delay in seeking health care of TB treatments. The odds of delay in seeking health care of TB treatments for those who unable to read and write were 6 times higher than the odds of respondents those attend college and above Education with [AOR: 6.05, 95%CI 2.283 6.863]. The odds of delay in seeking health care of TB treatments for who had financial constraints (transportation cost) were 2 times higher than the odds of their counterparts with [AOR: 2, 95%CI (1.110 3.945). The odds of delay in seeking health care of tuberculosis treatments for respondents with poor knowledge about tuberculosis treatment were 4 fold times higher than the odds of delay in seeking health care of respondents with good knowledge about tuberculosis with [AOR: 3.958, 95%CI 2.283 6.861]. The odds of delay for TB treatment for respondents with self-medication about TB treatment were 2 times higher than the Odds of delay in tuberculosis treatment who didn't practice self-medication (AOR:2.121, 95%CI (1.1.144 3.933).

Prior Attendance at, at nearby drug store, and traditional healers [AOR: 1.23(1.11 3.94)had also shown Association of patient delay in seeking health care of TB treatments. Only variables, which were associated with patient delay in seeking healthcare of TB treatments for both Bivariate and multivariate analysis displayed (above Table)

On multivariate logistic regression unable to read and write, poor Knowledge, self-medication, financial constraints to visit health facilities and visiting Pharmacy local dispensary remained as predictors of patient delay.

From Qualitative studies of IDI, two health professional, age of 30 and different sex states "The TB patients usually come from very poor families, and they usually live under poor conditions. Popular rules state that the man should get treatment before the woman since he is the pillar of the household. Other person supports this ideas, in the rural areas, the status of women is lower than that of men. When men get TB, all family resources may be spent, but that didn't do for women. So first of all the females hides her illness and then maybe the family does not support her financially so she has more difficulties to visit health facilities.

## HEALTH SYSTEM DELAY

The median health system delay was 5 days (mean 5.75) (range 4–85) days. 30% of participant experienced health system delay. About 40% of patients were diagnosed only after the second or the third visit. Participant who had health system delay more than 5 days were asked for main reason for the health system delay(n=340) were, ever tried drug rather than Anti-TB drugs 92(27%), absence of health care provider 128(37.6%), prolonged referral97(28.5%), prolonged waiting 128(37.6%), absence of drug 161(47%), distance to health facility 95(30%). Concerning the place of TB diagnosis 66% was confirmed at hospital level, 34% were in health centers that were closer to the community. Thirty (30%) of total delay was contributed by health system delay. The highest health system delay (87 day) was registered by one smear positive patient.

In bivariate analysis of health system delay sociodemographic variables have no significant association except education and income status and some health system factors which are candidate for multivariable logistic regression were ever used other drugs rather than Anti-TB, absence of health provider, long waiting time, prolonged referral between provider, multiple contact of health provider (>2 types).

In the Multiple logistic regression patients who were treated by other drugs other than anti TB were 4 times more likely delay compared to those who start TB drugs early or don't use other drug (AOR=4,95%CI 2.144 7.465). Patients who were prolonged referred were 3 times more likely Delay compared to those who referred to health facilities timely after first consultation in timely fashion (AOR = 3.4, 95%CI 1.592 5.671). Patients who visit more than 2 different types of health service providers before start of anti-TB treatment were 3.5 times more likely delayed compared to those with 2 or less (AOR = 3.405,95% CI 1.910 6.069). This was summarized in table-6 below.

*Finding from Qualitative study revealed, a 34 years, male participant who was general hospital medical director states" patients from periphery or from non-diagnostic center visit our hospitals after 2-3 weeks of their referral, they complain being powerless and lack transportation cost to visit hospitals". Participant #5 of Age 40 who was district hospital manger support, "The linkage between HEW and health provider seems very poor, their tracing mechanism of active case detection is poor, some provider lack commitment and patient didn't*

*get TB health care by acceptable timely fashion. This showed that prolonged referral between providers.*

*Finding from Qualitative study of in-depth interview revealed, male participant #7 of age 32 "majority of patients were not satisfied with consultation from one health care provider and they wish to consult non informal facilities like traditional healers, local pharmacy dispensary shops, especially those patients who come from rural residence". Also other participant express similar ideas, says" patient asked for their chief complaint most patients have TB symptoms and visit health facilities after 3-4 weeks of their onset, they had history of ever used other drugs rather than Anti-TB and come after illness worsened". This shows patients visit Several Health care providers more than two types.*

*Finding from Qualitative study, a 35 years old, female provider from laboratory room states "patients who is consulted by health provider in OPD for his complaints and when they come lab room for sputum examination when they didn't get this services they fill disappointment, due to lack of lab reagent during services, finally patients visit alternative informal facilities and they are exposed for unnessarary mismanagement and patients took drugs from local pharmacy. Implied supply shortage and long process in OPD and ever used drugs rather than anti-TB.*

**Table 7: Health system factors and tuberculosis treatment delay among pulmonary TB patients in Hadiya zone health facilities, SNNPR, April 2017.**

| Variables | Number | Health system delay | | COR(95% CI) | AOR(95% CI) | p-value |
|---|---|---|---|---|---|---|
| | | Yes | No | | | |
| Education | | | | | | |
| Illiterate | 192 | 53 | 139 | 0.12(0.011 1.281) | 0.264(2.144 7.465) | 0.181 |
| Primary school | 39 | 29 | 10 | 7(7.722 29.06) | 0.320(0.128 0.849) | 0.201 |
| Secondary | 72 | 44 | 28 | 2.3(0.57.2 9.515) | 0.391(0.113 1.356) | 0.139 |
| College and above | 37 | 22 | 15 | 1 | 1 | |
| Estimated income per month | | | | | | |
| <500ETB | 202 | 63 | 139 | 1.8(0.84 3.433) | 1.038(0.436 2.470) | 0.933 |
| 501-1000ETB | 42 | 16 | 26 | 2.3(0.947 5.623) | 1.297(0.434 3.84) | 0.639 |
| 1001-1500ETB | 84 | 17 | 72 | 1.6(0.657 4.23) | 1.149(0.364 3.629) | 0.812 |
| >=1500ETB | 12 | 12 | 7 | 1 | 1 | 1 |
| **Provider contact** | | | | | | |
| <_ 2 types | 205 | 43 | 162 | 1 | 1 | 1 |
| >2 types | 135 | 60 | 75 | 3(1.869 4.860) | 3.405(1.910 6.069) | 0.001 |
| Factors for HSD | | | | | | |
| Distance <=10 km | 296 | 81 | 215 | 1 | 0.505(0.410 1.552 ) | 0.220 |
| >10 km | 44 | 22 | 22 | 2.6( 1.39 5.05) | | |
| **Prolonged referral b/n provider YES** | 107 | 39 | 58 | 1.88(1.145 3.09) | 3.005(1.592 5.671) | <0.001 |
| **NO** | 263 | 64 | 179 | 1 | 1 | 1 |
| **Ever tried other drugs and not cured (Yes)** | 107 | 42 | 46 | 2.97(1.79 4.94) | 4.0(2.144 7.465) | 0.001 |
| **NO** | 233 | 61 | 172 | 1 | 1 | 1 |
| Absence of drugs | 80 | 74 | 6 | 1.168(0.753 1.856) | 1.216(0.670 2.205) | 0.521 |
| Long waiting during services YES | 183 | 57 | 126 | 1.07(0.67 1.22) | 1.213(0.678 2.169) | 0.515 |
| NO | 157 | 48 | 109 | 1 | 1 | 1 |
| Form of TB | | | | | | |
| PTB+(smear positive) | 251 | 80 | 171 | 1 | 1 | 1 |
| PTB-(smear negative) | 89 | 23 | 56 | 1.34(0.77 2.32) | 0.75(0.434 1.283) | 0.062 |

**Total tuberculosis treatment delay**

The median total delay was 35 days (IQR: 26 - 64). The longest total delay observed was 225 days. 177(49.8%) of the respondents had a total delay of median more than 35 days. The majority of the total delay was contributed by patient delay. Patient delay contributed a greater proportion of the total TB treatment delay. The predictive ability of the model tested with the goodness of fit with Hosmer-Leme show test; at a p-value of >0.05 and model specification was checked with some important points of variables. On multivariable Logistics analysis, being unable to read and write, knowledge about TB, traditional healers visit, financial constraints, several health providers visit of greater than two, prolonged referral between provider and ever used other drugs rather than Anti-TB were associated significantly with total TB treatment delay after checking candidate variables on Bivariateanalysis. Poor knowledge of TB (AOR, 2.7 95% CI (1.58 4.84) was associated with total tuberculosis treatment delay, which is in line with study conducted in Northwest gojjam zone of Ethiopia from 2013 to 2015. Unlike to study in Gojjam zone form of TB didn't associated with tuberculosis treatment delay. This might be study period and setting difference, there improvement of diagnostic facilities.

Table 8: Summary of Bi-variate and Multivariate analysis of factors associated with total TB treatment delay in seeking TB treatment among Pulmonary TB patients in Hadiya health facilities, SNNPR, June 2017.

| Variables | Total delay >35 days | Total delay <35 days | COR(95% CI) | AOR(95% CI) | p-value |
|---|---|---|---|---|---|
| **Education** | | | | | |
| Unable to read and write | 100 | 90 | 5(2.52 12.95) | 2.5(1.96 6.624) | 0.006 |
| Primary | 14 | 23 | 1.2(0.375 3.05) | 1.68(0.516 5.492) | 0.384 |
| High school | 39 | 28 | 1.2(0.489 3.08) | 2,5(0.87 7.55) | 0.86 |
| College and above | 11 | 24 | 1:0 | 1 | 1 |
| **Knowledge** | | | | | |
| Poor | 84 | 122 | 3.9(2.44 6.29 | 2.7(1.58 4.84) | 0.001 |
| Good | 36 | 98 | 1:00 | 1:0 | |
| **Informal treatment sources** | | | | | |
| Traditional healers | 87(157 | 62(183) | 2.4(1.55 3.70) | 2.3(1.258 4.311) | 0.007 |
| Pharmacy shop dispensary | 55(157 | 40(183) | 1.9(1.084 3.09) | 1.15(0.59 2.24) | 0.668 |
| Self-medication | 65(106) | 41(234) | 1.7(1.084 2.8) | 1.4(0.76 2.49) | 0.29 |
| Fear of diagnosis | | | | 1.17(0.65 2.09) | 0.600 |
| Hoped that symptom go away by itself | 87(149) | 61(190) | 2.4(1.02 3.345) | 1.8(1.07 3.14) | 0.027 |
| Financial constraints | 49(84) | 33(256) | | 2.3(1.24 4.355) | 0.008 |
| Residence | | | | | |
| Rural | 99 | 96 | 0.5(0.309 0.86) | 0.167(0.355 1.195) | 0.650 |
| Urban | 55 | 35 | 1.2(0.538 1.802 | 0.357(0.647 2.067 | 0.715 |
| Semi urban | 31 | 24 | 1 | 1 | |
| Walking distance | | | | | |
| >10KM | 134 | 162 | 1.3(0.732 2.64) | 1.2(0.65 2.09) | 0.67 |
| <10 km | 23 | 21 | 1 | 1 | |
| **Perceived stigma** | | | | | |
| Low | 72 | 127 | 1 | 1 | 1 |
| High | 86 | 55 | 2(1.37 3.301) | 0.79(0.45 1.40) | 0.427 |
| **Provider contact** | | | | | |
| <_2 types | 73 | 132 | 1 | 1 | 1 |
| >2 types | 84 | 50 | 3(1.93 4.74) | 2.8(1.65 4.89) | <0.001 |
| **Prolonged referral** | 65(111) | 45(229) | 2(1.39 3.54) | 1.7(0.97 3.189) | 0.006 |
| **Ever used drugs** | 42(95) | 47(235) | 1.3(1.03 4.54) | 0.8(0.45 1.55) | 0.57 |

# CHAPTER Six Discussion

Early diagnosis of disease and prompt initiation of treatment is essential for an effective TB control program. Delay in diagnosis and treatment may worsen the disease, increase risk of poor clinical outcome, including death and enhance transmission of TB in the community. The finding of this study indicated that there is a substantial prolonged delay in health care seeking of pulmonary TB after the onset of symptoms. World Health organization (WHO)classifies unexplained cough with or without other symptoms lasting 2-3 weeks as TB suspect and the patients will seek treatments within the given period[23]. However, studies added extra margin of 7 days to take 30 days as cutoff point to assess magnitude of patient delay and factors: a delay >30 days[19, 25, 41]**.**

The median patient, health system and total delay were 31 days, 5 days and 35 days respectively. 49.1% of the patients delayed beyond the median where as 30% of the patients encountered the health system delay beyond the median (5 days). In this study, 49.8% of the patients had a total delay beyond 35 days. The majority, of the total delay was contributed by patient delay. 128 (37.6%) of smear positive patients had a delay more than 30 days. The prevalence of patient delay in this study was 49.1% which is consistent with studies done in Oromia region and Tigray (49.7% ,53% respectively[19, 42]. But the result of this study was lower than studies done in Somali region, Ethiopia (87%) [18]. The possible reason for this gap might be due to the fact that in Somalia region, where majority nomadic people were lives in dispersed location and inaccessible to modern medical health care compare to Hadiya zone, SNNPR.

The median patient delay in this study was 31 days. This is in accordance(consistent) with studies from Bahir Dar, Arsi zone and Tigray Region of Ethiopia[18, 19, 43], These findings are consistent with previous studies from East Mediterranean of WHO studies in Iraq (median, 31 days), Syria (median 31 days), and Somalia. However, the result of the same study in east Mediterranean in Pakistan (median, 9 days), Egypt (median, 12 days) showed that TB patients were more less delayed than in this study[29]. The possible explanation for differences in delay could probably be explained by the socio-cultural factor, low socio economic status, low level of knowledge and awareness of the disease and lack of information about availability of free TB treatment. It is slightly higher than findings from Afar, Ethiopia (median 20 days), Northwest Ethiopia (median 21 days respectively), and South Africa(15 days)[44]. It is also relativelyhigher

than Georgia (23.5 days)[45]. However, the median Patient delay in this study is lower than reports from Somali region, Bale Zone, Mozambique, and Tanzania (median delay of 60, 63, 60, 61, 50, 62 days respectively) [24], [26, 46-48] . The Possible explanation for observed differences among these studies may be due to differences between countries and their health system, policies and infrastructure of the countries, differences in demographic characteristics of the study population that is rural versus urban setups, and pure agrarian versus pastoralist communities. The other reason may be the study period when studies were conducted.

Even though it was difficult to assess factors for health system delay from patient side, it could reveal some information on the factors. We didn't get any similar reports from other study. The finding from this study revealed that, median Health system delay was in accordance with studies from Ethiopia[16] (6 days) and lower than reports from Oromia region [5] median delay of(9,)The observed difference might be difference countries, study period and setup. The other reason was currently that patient suspect to be according to WHO cutoff point and diagnosed in lab spot-spot sputum examination which is very rapid and finished within 30-45 minute. But the former one was spot-morning-spot which takes 2-3 days during lab diagnosis even some patients didn't return back again.Visiting several health care provider was associated with health system delay which is similar with studies from Pakistan, showed that visiting several health care providers was significantly associated with health system delay. The majority of the patients Pakistan were not satisfied with consultation from one health care provider. These results are in agreement with reports from other countries. In Tanzania, a longer health care system delay was seen when patients, especially in rural areas, consulted traditional healers[26, 29].

Visiting two or more health care providers, ever used drugs rather than Anti-TB, prolonged referral and were independent predictors of health system delay as reported by participants.

Treating TB patients with several doses of antibiotics before TB suspect is associated with Health system delay. This is similar with Afar Region studies[16, 17] .This is might be weak supervision and poor skill of some health professionals while managing TB cases.

Unable to read and write in educational status was found to be predictor of patient delay, this finding which is consistent with result from Ethiopia [16, 17, 48]. This could be due to the fact that those patients with no education have poorer knowledge About TB and thus 4 times less likely to seek health care in health facilities at the earliest time [AOR:3.95,95% CI (2.283 6.863)].

Poor knowledge of TB is associated with patient delay. The association between poor knowledge of TB and patient delay is very strong as is also the case in other studies from Bahir Dar, Tigray, Somali and Uganda[29, 48], [30, 54]. Financial constraints for transportation were associated with patient delay in this study. This is in line with report from Kampala [16, 40].Self-treatment(Medication)was found to be determinants of patient delay. This is similar with findings from Afar Ethiopia, Georgia [16, 40].This was supported by Qualitative study finding

*A 38 years old female who was living in rural area said that "most orthodox Christian followers went to churches where different faith based service is provided as initial treatment and stays for a period of time like one week determined by church leaders"*

This finding indicated 56.4% of TB patients had sought care in health facilities after visited alternative source of treatment (pray church, traditional healer and private drug store) and this study was consistent with study done in Tigray[19], Amhara [18].The possible explanation using of informal therapies might be related to religious beliefs of patients, in which about 87% of our study participants were Protestant and orthodox Christians. Church, the most predominant religious Faith-Based institution in the study area.

Rural residence and being female sex had no statistically significant association with patient delay. This is incontrary to findings from East Wollega, Tigray North West Ethiopia, Kenya, and Georgia[19, 45, 49, 50]. This may be due to the gradually improving access to the health care system in the rural community and the involvement of women in their own health issues (Health development army) in their community providing opportunity for women to benefit from the awareness creation and promotion activities. Unlike other studies[16, 18] the distance or time taken to health facility had not found to affect the delay. It seems this may be due to the fact that the majority (87.8%) of the respondents lives in a distance within 10 km.

In this study nearly half ,42% of the study participants had perceived stigma of TB on relationship with other, isolated to live other since diagnosed, social and family relationship. This study consistent with Gibe, south west Ibadan [17, Ethiopia [25], Perception of stigma might have great impact on the social, psychological and mental wellbeing of the victim and also his/her family. This was supported by the qualitative study, a 30 years old woman in the urban area said that "*If I discuss my TB status to my friends, I will be a victim gossip in the community and my children couldn't play with their friends and learn at school "The other person a 50*

*years old man in rural kebele expressed his idea by saying that "some people in the community reduce social interaction with TB patients because it is difficult to identify whether they are free from HIV or not. This indicates negative attitude towards TB treatment.*

## Total tuberculosis treatment delay

The median total delay in our study was found to be 35 days and this is lower with previous reports from Ethiopia [5, 16, 51].The possible explanation for this discrepancy might be different cultural practices across countries, study period, socioeconomic practices, improvement of health system and health polices through time. In the current study, patient delay was a major contributor to the total delay, consistent with a previous report from Ethiopia [5, 16, 17]

The total delay to TB treatment (the combination of patient and health system delay) observed in this study is lower to the delays reported in other studies in sub-Saharan Africa: 12 weeks in Botswana and 16 weeks in Ghana [24, 28].The possible difference for this discrepancy might be socioeconomic status ,study area and period, different health policies and strategies across countries.

### Limitations of the study

The 1st one is we included illegible patients on intensive phase of treatment during the collection period and the delay is also as reported by the patient. These might introduce recall bias to the study. We have used religious dates as a reference to minimize recall bias among participants. The study was health facility based therefore we missed people with TB symptoms but not have attended health facilities whom might have different characteristics and might experience longer delay.This influences the underestimation of the length of delay we reported and therefore it is difficult to generalize the result to all pulmonary tuberculosis patients in the Region.Due to crossectional study design nature it didn't provides temporal relationship of cause effect.

# CONCLUSIONS AND RECOMMENDATIONS

## Conclusions

This study found significant association between TB treatment delay and associated factors among PTB patients. There is substantial prevalence of patient and health system delay in study area. Overall, nearly half of the total delay was contributed by patient delay. This is an important preventable period of infectiousness in the community caused by the failure of recognized health services todiagnose tuberculosis among symptomatic individuals. Facilities relatively nearer to the people were also contributing less in the process of case detection, while case detection is one ofthe strategies in the prevention and control of tuberculosis.

Unable to read and write, Poor knowledge of TB, self-treatment,financial constraints (transportation), prolonged referral, several visit of health care provider of two or more and ever used other drugs rather than Anti-TB drugs were found to have association with patient delay and health system delay. This may lead to continues existence of TB cases which probably leads to the emergence of MDRTB (Multi Drug Resistant TB).In addition, as far as the health system delay is concerned we can conclude from these mentioned facts that any mismanagement (ever used other drugs rather Anti TB), Having contact more than two health provider, unnecessary prolonged referral during services and the absence of up to service deliver at outpatient department and laboratory area will result in patient disappointment and the patients to look for alternative health care which further prolongs the patient and health system delays. In the general term, the median health system delay isn't in the reasonable time with regard to situations on the ground. by this time supposed to manifest major pulmonary symptoms of TB. These patients were visiting two or more health care providers before diagnosis so that they could pose a risk to the health professionals as well unless otherwise properly managed.

## Recommendation

Based on results found in this study, the following recommendations are made:

This study addressed tuberculosis treatment delay and its associated factors. Therefore, it is suggested that, *Poor knowledge of TB and self-treatment can be prevented by community based interventions. Health professionals should be supported to strengthen the activities of health education and promotion. A well-designed IEC/BCC strategy for TB might improve the TB control program*. A well-designed information education, communication/behavioral communication (IEC/BCC) strategy for TB might improve the TB control program. (**For zonal health department and district hospitals).**

To increase case detection early establishing functional referral pathways, building the capacity of health providers skills and practice to increase the index of suspicion and availing rapid diagnostic test for TB at lowest health facilities are important first step (**for health facilities).**

Inclusion of non-formal health sectors and private providers in the process of case detection and identification could contribute in reducing delays. In addition, the health sector managers need to pay due attention to the TB service and should regularly monitor clients about their services. Community should be sensitized on seeking appropriate health care, sensitization programs should take into consideration different groups in a society such as women, elders, illiterate and poor by using culturally convenient media of communication to ensure that the whole community is reached (**forhealth managers).**

Finally, it is also recommended that a comprehensive future study that consists of strong methodologies and analysis focusing on TB diagnosis and providers delay should be conducted in order to obtain information on factors contributing to patient and health service delay to strengthen or further formulate TB prevention and control program (prompt diagnosis and early initiation of TB treatment). A community based study can be done to capture symptomatic individuals who are not attending health facilities**.** Conducting a well designed study to identify the reasons why most health centers, where larger segments of the community is closer, were not involved in the diagnosis of tuberculosis might clearly show ways of improving the services in these facilities **(forresearchers)**

## Reference


1. WHO, Global Tuberculosis Report 2013. World Health Organization.

2. FMOH, (2012) Guidelines for clinical and programmatic management of TB, leprosy and TB/HIV in Ethiopia. FMOH,Addis Ababa

3. Tsegaye D, A.E., Mesele T, Tadesse T, etal, Delay in Seeking Health Care and associated Factors among Pulmonary Tuberculosis patients in North Wollo Zone, Northeast Ethiopia: /institution Based crossectional Study. iMedPub Journals 2016 7(3) 1-7

4. WHO, Global Tuberculosis control.2010,WHO report.

5. Abdulbasit H, D.M., Sisay Gare S,Teshome G,, (2015)Delay in Tuberculosis Diagnosis among Tuberculosis Patients at the Three Hospitals: Asella, Robe and Abomsa of Arsi Zone, Oromia Regional State, March, , Open Access Library Journal ,2(1-8).

6. WHO, Global Tuberculosis Report 2014a,Geneva: World Health Organization(2014a).WHO report.

.7. WHO, GLOBAL TUBERCULOSIS REPORT,`WHO.2016.

8. WHO, Declares Tuberculosis an Emergency in Africa. Genava, World Health Organization,2005. World Health Organization,Geneva. .

9. WHO, World Health Organization (WHO) Global Tuberculosis Report ,2015,WHO report .

.10. Nigatu T, A.M., (2010)Epidemiological analysis of tuberculosis trends in Ethiopia. Tuberculosis Toraks Dergisi,58(4) 375-384

11. Abebe G, Deribew A, and Apers L, Knowledge, health seeking behavior and perceived stigma towards tuberculosis among tuberculosis suspects in a rural community in southwest Ethiopia.PLOS ONE 5(10).

12. FDRE MOH, FDRE,Guideline for the national TB Leprosy Control Programme in Ethiopia Addis Ababa.Federal Ministry of Health Ethiopia,2007.

13. Dye C, W.B., (2012) The population dynamics and control of tuberculosis. PubMedGoogle Scholar 328(5980)

14. Engeda EH, D.B., Woreta HK, Kelkay MM, Ashenafie TD, eatal, (2016) Health Seeking Behaviour and Associated Factors among Pulmonary Tuberculosis Suspects in Lay Armachiho District, Northwest Ethiopia: Tuberc Res Treat

15. Yimer S, B.G., Alen G,, Diagnostic and treatment delay among pulmonary tuberculosis patients in Ethiopia: a cross sectional study.BMC Infectious Diseases 2005, 5(112).

16. Demissie M, L.B., Berhane Y,, (2002) Patient and health service delay in the diagnosis of pulmonary tuberculosis in Ethiopia. BMC Public Health 22(23) 1-23.

.17. Belay M, B.G., Ameni G, Abebe F, etal, (2012)Diagnostic and treatment delay among Tuberculosis patients in Afar Region, Ethiopia: A cross-sectional study.BMC Public Health ,12(369) PP1-23.

18. Gebeyehu E, A.M., Abeje G,, (2014) Factors Associated with Patient's Delay in Tuberculosis Treatment in Bahir Dar City Administration, Northwest Ethiopia . BioMed Research International, Article ID: 701429.

19. Mesfin MM, T.T., Tareke IG, Kifle YT , Karen WH , Richard MJ,etal, (2005) Delays and care seeking behavior among tuberculosis patients in Tigray of northern Ethiopia. ,Ethiopian Journal of Health Development 19(12) 7-12.

20. WHO, World Health Organization (WHO) . 2015,Global Tuberculosis Report

21. WHO, The stop strategy Building on and enhancing DOTS to meet, the TB-related Millennium Development Goals, 2006, WHO.

.22. WHO, Treatment of Tuberculosis: Guidelines for National programs. Geneva, World Health Organization,.2013.

23. Takarinda, H., AD, Nyathi B, Ngwenya M, Mutasa-Apollo T, Sandy C, etal., Tuberculosis treatment delays and associated factors within the Zimbabwe national tuberculosis programme,2016.MC Public Health 15(29) pp1-12.

.24. Steen TW, M.G., Pulmonary Tuberculosis in Kwening District Botswana: delay in diagnosis in 212 smear positive patients. 1998,INT J TUBERC LUNG DIS 2(627-634).

25. Cambanis A, Y.M., Ramsay A, Squire SB, Arbide I, Cuevas L, etal, (2016) Rural poverty and delayed presentation to tuberculosis services in Ethiopia, Tropical Medicine and International Health 21(1365-3156)

26. Wandwalo ER et al, Delay in tuberculosis case-finding and treatment in Mwanza,Tanzania .NT J TUBERC LUNG DIS,2000, 4(133-138).

27. Awol H, B.S., Tessema F, Mohammed S,Deribe K ,Deribew A,etal, (2012)Treatment delay among pulmonary tuberculosis patients in pastoralist communities in Bale Zone, Southeast Ethiopia. BMC 5(320)

28. Lawn SD etal, Pulmonary tuberculosis: diagnostic delay in Ghanaian adults. 1998,INT J TUBERC LUNG DIS 2 pp 635-640.

29. WHO, An in-depth analysis of the health-seeking behaviour of patients and health system responce in seven countries of eastern Meditrenian Region.2009 WHO swizerland,Geneva.

. p. 1-48.

30. Liam CK, T.B., Delay in the diagnosis and treatment of pulmonary tuberculosis in patient attending a University Teaching Hospital.1997,INT J TUBERC LUNG DIS 1(326-332).

.31. Rajeswari R , C.V., Suhadev M , Sivasubramaniam S, Sudha G , Renu G, etal., (2002) factors associated with patient and health system delays in the diagnosis of tuberculosis in South India . INT J TUBERC LUNG DIS,6(9) 789-795,pp1-7.

32. Insua , H.S., Zanna F, Matji R, Smith A,etal, (2012) Reducing TB Delays: Evaluating the Frequency and Causes of Delays in Bangladesh and Swaziland. USAID (1-40).

33. Yimer , S., G. Bjune , and G. Alen Diagnostic and treatment delay among pulmonary tuberculosis patients in Ethiopia: a cross sectional study. BMC Infectious Diseases, 2005. 20055(112): p. 1-20.

34. Xu B, F.G., Thorson A,, Perceptions and experiences of health care seeking and access to TB care – A qualititative study in rural Jiangsu Province, China Health Policy 2014 69(139-49).

35. Olumuyiwa O, O., Babafemi JO,, (2004)Patterns of delays amongst pulmonary tuberculosis patients in Lagos, Nigeria ,BMC Public Health,4(18)

36. Madebo T, L.B., Delay in treatment of pulmonary tuberculosis. An analysis of symptom duration among Ethiopian patients. 1999,Meds cape General Medicine.

37. Corbett EL, W.C., Walker N,, (2003) The growing burden of tuberculosis: global trends and interactions with the HIV epidemic. PubMed,Archives of Internal Medicine 163(1009-1021)

38. Salaniponi FM, H.A., Banda HJ,, Care seeking behaviour and diagnostic processes in patients with smear positive pulmonary tuberculosis in Malawi. INT J TUBERC LUNG DIS 1991 4(327-332).

39. Tsegaye D, A.E., Mesele T, Tadesse T,etal., (2016) Delay in Seeking Health Care and associated Factors among Pulmonary Tuberculosis Patients in North Wollo Zone, Northeast Ethiopia .Institution Based Cross-sectional Study,Archives of Clinical Microbiology 12(345) 1-45

40. Kansiime C, K.S., Levi M, Asiimwe BB, Katamba A, etal, Health Service Delay among Pulmonary Tuberculosis Patients Presenting to a National Referral Hospital, Kampala, Uganda: A Cross Sectional Study. The Pan African Medical Journal, 2013,15(84).

41. Yimer S, G. Bjune, and Alene G, Diagnostic and treatment delay among pulmonary tuberculosis patients in Ethiopia: a cross sectional study.2005,BMC Infectious Diseases 2005, 5(112) PP 1-8.

.42. Hamza A, D.M., Gare S, Teshome G,, (2015) Delay in Tuberculosis Diagnosis among Tuberculosis Patients at the Three Hospitals: Asella, Robe and Abomsa of Arsi Zone, Oromia Regional State, Open Access Library journal (2).

43. Hamusse SD, D.M., Teshome D, Lindtjorn B, etal, Fifteen-Year Trend in Treatment Outcomes among Patients with Pulmonary Smear-Positive Tuberculosis and Its Determinants in Arsi Zone, Central Ethiopia. Global Health Action, 7.

44. Meintjes G, S.H., Morroni C, Wilson D, Maartens G, etal, Patient and Provider Delay in Tuberculosis Suspects from Communities with a High HIV Prevalence in South Africa: A Cross-Sectional Study. 2008 ,BMC Infectious Diseases, 8, 72.

45. Rabin AS, K., G, Sanikidze, E, Kempker R, Blumberg HM,etal., (2013)Prescribed and Self-Medication Use Increase Delays in Diagnosis of Tuberculosis in the Country of Georgia. The International Journal of Tuberculosis and Lung Disease: The Official Journal of the International Union against Tuberculosis and Lung Disease, 17, 214-220. 2013.

46. Saifodine A, G.P., Sidat M, Black J, etal, Patient and Health System Delay among Patients with Pulmonary Tuberculosis in Beira City, Mozambique. BMC Public Health,2013 13, 559.

47. Basnet R, H.S., Enarson D,Malla P, Morkve O, etal, (2009 )Delay in the Diagnosis of Tuberculosis in Nepal. BMC Public Health 9, 236.

48. Gele AA, B.G., Abebe F,, (2009) Pastoralism and delay in diagnosis of TB in Ethiopia. BMC Public Health 9(5).

49. Wondimu T, M.K., Kassahun W,Getachew S, etal, (2007)Delay in initiating tuberculosis treatment and factors associated among pulmonary tuberculosis patients in East Wollega, Western Ethiopia.Ethiop.J.Health Dev ,21(2) pp1-9

50. MOPH S ( 2013) Division of Leprosy Tuberculosis and Lung Disease: Annual Report 2013. Ministry of Public Health and Sanitation, Nairobi, Kenya. Division of Leprosy Tuberculosis and Lung Disease

51. Yimer S, Bjune G, and Alene G, Diagnostic and treatment delay among pulmonary tuberculosis patients in Ethiopia: a cross sectional study.2005,BMC Infect Dis ,5(112).

## Annexes 1

Jimma University,institute of health science, Department of Health Education and Behavioral Sciences Verbal Consent Form of TB patients before Conducting the Interview.

Introduction

Good morning/afternoon

I am from Jimma University to study TB treatment total delay and associated factors among TB patient's students in Hosanna, Hadiya zone region by asking you. Based on the information what you give us and other related information the result of this study will help to develop a possible solution or to recommend if any problems encountered in the situation.

### Consent Form

Hello, my name is _____. I am working in the research team of Jimma University and I would like to interview you a few questions about your experience and opinion of TB treatment services while you are following treatment in this health center. The objective of this study is to improve the TB treatment service so as to meet the needs of TB patients. Your cooperation and willingness for the interview is helpful in identifying problems related to the subject matter. Your name or address will not be written in this form. All information that you give will be kept strictly confidential. Your participation is voluntary and you are not obliged to answer any question you do not wish to answer. If you are not still discomfort with the interview, please feel free to drop it any time you want. Do I have your permission to continue? Are you willing to participate in this study?

Yes ☐ No ☐

Put "X" mark in the box you chosen.

If yes, signature _____

Interviewer's name ----------, signature----------

Date of interview----------, Time started _____, Time finished ---------

Participant Signature _____ Date_____

## Annex 2 Questionnaire

Date_____

Identification code: _____

Date of interview: Day /Month/year.

TB registered ID card number_____

**Direction: This questionnaire has four dimensions (parts**)

1. Socio-demographic and patient delay characteristics.

2. Knowledge related Questions about TB disease.

3. perceived stigma towards TB.

4. Health system delay factors and qualitative Questionnaire.

This questionnaire is adapted from reviewing similar articles done in other African countries and EDHS socio-demographic variables reviewed

## A. Patient related questionnaire (socio demographic economic and patient status related)

| QUESTIONS | CATEGORIES AND CODES | RESPONSE |
|---|---|---|
| Age of patients(in completed years) | _____ | |
| What sex of the patient and write relevant code? | (1). Male<br>(2). Female | |
| What is your religion? | (1). Protestant<br>(2). orthodox<br>(3). Muslim<br>(4). Other (specify) ….. | |
| Marital status | (1). Married,<br>(2). Single<br>(3). Divorced,<br>(4) Other….. | |
| What is your Residence? | 1)urban<br>2) semi urban<br>3 rural<br>4) homeless<br>5) Other (specify)……. | |
| What is your educational level | (1) illiterate<br>(2) primary school<br>(3) High school<br>(4) college level<br>(5)other(specify) | |
| What is ethnicity of the respondents | 1) Hadiya<br>2) Gurage<br>3) Kembata<br>4) Amhara<br>5) Other (specify)…… | |
| Income in ETB(estimated) | _____birr | |

| | | |
|---|---|---|
| 9 | What is your current occupation? | (1). Peasant<br>(2). Business (merchant)<br>(3). Employed<br>(4). Not employed<br>(5). Housewife<br>(6). Others (specify). |
| | | |
| 10. | State symptom (s) that first made you to seek care for your illness. | (1). Cough<br>(2). Coughing blood<br>(3). Breathlessness<br>(4). Chest pain<br>(5). Fever<br>(6). Fatigue/weakness<br>(7). Loss of weight<br>(8). Loss of appetite<br>(9). Others (Specify) |
| 11 | How long did it take from the time you first feel ill and the time you went to health facility? | (1) Days ☐<br>(2) Weeks ☐<br>(3)Months ☐ |
| 12 | Do you consider this time is a delay or not? ( This Question decided by interviewer or investigator based on cutoff point) | (1) yes<br>(0) no |

| | | | |
|---|---|---|---|
| 13 | What do you think is the cause of your delay to seek healthcare? (MULTIPLE RESPONSE POSSIBLE) | (1). Fear of what would be found diagnosis<br>(2). Hope that the symptoms will be go away by themselves<br>(3). Fear of social isolation<br>(4). Financial constrains (transportation)<br>(5). Poor health services<br>(6) resorts visitation<br>(7). Other (specify) | **1) Yes**<br>**(0) No (for all response)** |
| 14. | Where was your first place to seek care? | (1). Traditional healer (1) yes (0) no<br>(2). Pharmacy shop (1) yes (0) No<br>(3). Health center (1) yes (0) No<br>(4). Hospital 1) Yes 0) No<br>(5). Self-medication 1) yes 0) No<br>(6). Prayers 1) yes 0) No<br>(7). Others (specify). 1) yes 0) No | |
| 15. | Why did you go to that place? (Refer the place where he/she has mentioned in the above question). | (1). Confidence in getting cure<br>(2). Services available anytime<br>(3). Referred by previous provider<br>(4). Free services<br>(5). Advised by somebody<br>(6). Others (specify) | |
| 16 | Some people do not seek<br>health care at the hospitals/ health centers or dispensaries when they have the same condition as you have, what do you | (1). Too far<br>(2). Long waiting time at the health facilities.<br>(3). They have no money to pay<br>(4). Belief that they can be cured by | |

B-KNOWLODGE RELATED QUESTIONARIE

| | | | |
|---|---|---|---|
| 17 | Do you know what TB (samba nekarissa) is? | Yes… (1)<br>NO…… (0) | Response |
| 18 | Tuberculosis (samba nekarissa) is a serious disease? | Yes…… (1)<br>No…… (0) | |
| 19 | What in your opinion cause TB? | 1. Infection<br>2. punishment<br>3. unavoidable4) I don't know | |
| 20 | What are the symptoms of someone infected with TB? Multiple response) | 1. Cough more than 2 weeks (2)Fever<br>(3) Diarrhea<br>(4) Appetite gain | |
| 23 | Some causes of TB will require a longer treatment to be cured | Yes… (1)<br>No…… (.0)<br>I don't know (3) | |

| | | | |
|---|---|---|---|
| 24 | Tuberculosis treatment is given free of charge | Yes……1<br>No…….0<br>I don't know…..3 | |
| 25 | Tuberculosis is killer disease than HIV | Yes……1<br>No…….0<br>I don't know…..3 | |
| 26 | TB affect HIV/AIDS prognosis | Yes……1<br>No…….0<br>I don't know…..3 | |
| 27 | Do you have opinion about TB is preventable disease? | Yes……1<br>No…….2<br>I don't know....3 | |

**C. About Perceived Stigma structured questionnaire**.

What did you think/feel about the following statement?

| | | |
|---|---|---|
| 29. I am ashamed of having TB disease. | (1). Strongly disagree<br>(2). Disagree<br>(3). Not sure<br>(4). agree<br>(5). Strongly agree | **Response.** |
| 30. Having diagnosed to TB I have to hide other people. | (1). Strongly disagree<br>(2). Disagree<br>(3). Not sure<br>(4). agree<br>(5). Strongly agree | |
| 31. TB diseases affect relation with other people. | (1). Strongly disagree<br>(2). Disagree<br>(3). Not sure<br>(4). agree<br>(5). Strongly agree | |
| 32. TB disease is very costly due to its long duration of treatment. | 1). Strongly disagree<br>(2). Disagree<br>(3). Not sure<br>(4). agree | |

| | | |
|---|---|---|
| | (5). Strongly agree | |
| **33.** I prefer to live isolated since diagnosed to TB disease. | 1). Strongly disagree<br>(2). Disagree<br>(3). Not sure<br>(4). agree<br>(5). Strongly agree | |
| **34.** TB diseases can affect work performance | 1). Strongly disagree<br>(2). Disagree<br>(3). Not sure<br>(4). agree<br>(5). Strongly agree | |
| **35.** TB disease can affect family relation. | 1). Strongly disagree<br>(2). Agree<br>(3). Not sure<br>(4). agree<br>(5). Strongly agree | |
| **36.** TB disease is poverty disease | 1). Strongly agree<br>(2). Agree<br>(3). Not sure<br>(4). agree<br>(5). Strongly agree | |
| 37. Having diagnosed to TB, I feel inferiority complex to m y family | 1). Strongly disagree<br>(2). Disagree<br>(3). Not sure<br>(4). agree<br>(5). Strongly agree | |

**D. Health system delay (diagnostic and treatment delay interview questioners**

**38.** Date of first TB diagnosis (dd/mm/year): ____

**39.** Number of health seeking encounters (HCP) before initial TB diagnosis: _____

**40.** Health facility of the HCP who made the initial TB diagnosis

**Code of Health facility:**

TB center (0), PHC (1), Public (2), Hospital (3), Private health facilities (4)

**41.** Specialty of the HCP who made the initial TB diagnosis:

1. Chest specialist Internist 3.GP 4. Others (specify)

**Q 42**. Action taken by HCP who made the initial TB diagnosis:

Sputum examination (1) X-ray (2) Referral (3) (4) Others

**43.** The type of PTB diagnosed: (1) positive (2) negative

**Treatment commencement (filled by reviewing register and patient interview**)

**Q 44** Tuberculosis treatment start date(dd/mm/yy) ...……

Q **45**. How far is it from your original residence /home to the current DOTS center where you are now started -TB drugs**?** (State the approximate distance in Km and travel time in minutes for one way) _____ Km. Or _____ Min.

Q **46.** How long did it take from the time you first Diagnosis and the time to start anti TB?

(1) Days_____, (2) Weeks_____, (3) Month_____

**Q 47** Do you think this is delayed to treatment initiation? (Decided by data collector based on cut of point and crosschecked by TB resistor (1) Yes (0) No

**Q 48.** What do you think is the cause of your delay to initiate anti TB early?

Distance to health facility (1) yes (0) No

Absence of drugs in clinic (1) yes (0) No

Prolonged long waiting time during service>1 hour. (1) yes (0) No

Prolonged Referral (1) yes (0) No

Absence of health care provider (1) Yes (0) NO

If ever tried other drugs and not cured (1) Yes (0) No

**QUALITATIVE PART(separate Questionnaire prepared for Patients and providers)**

Sociodemographic status of respondents

1. Age of respondents? 2. What is Sex of client? (3) What is your current Occupation?

4.. Education status of respondents? (5) residence of patients?

**Title of the study:** TB treatment delay and associated factors among PTB patients

This question is prepared to delayed patients to explore the reasons for their delay.

In-depth Interview guidelines (IDI).

1. What are your practices, beliefs and opinions about TB (samba nekarissa) treatment delay? (For patient interview)
    a. Delayed diagnosis and presentation.
    b. Delayed initiation of drugs.
    c. Patient and provider consultation

2. opinion about timelines of TB diagnosis and treatment (for provider)

3. Why people choose informal facilities more than modern one? Why they go there? (provider)

4. What traditional beliefs, attitudes and misconceptions affect early presentation to modern public facility? For provider and patients

5. What are barriers that can affect early diagnosis and treatment behavior of TB patient?

how was process of HF during lab Diagnosis, consultation and early start ofdrugs? (Providers')

7. Why /how people prefer the traditional beliefs and socio-cultural practice than modern facilities? (Question or both patient and provider).

8 How was your referral pathways, tracing mechanism and patient services delivery? For provide

## Amharic version Questionnaire (local language)

| ተ.ቁ | መጠይቅ | ኮድ | ምላሽ |
|---|---|---|---|
| 1 | የታማሚውዕድሜ | | |
| 2 | የታማሚውጸታ | (1) ወንድ<br>(2) ሴት | |
| 3 | የሚከተለትሀይማኖት | (1) ፕሮቴስታንሰት<br>(2) ኦርቶዶክስ<br>(3) ሙስሊም<br>(4) ሌላይገለጽ | |
| 4 | የታማሚውየጋብቻሁኔታ | (1) ያገባ/ች<br>(2) ያላገባ/ች<br>(3) የፈታ/ች<br>(4) ሌላይገለጽ | |
| 5 | የታማሚውየመኖሪያአድራሻ | (1) ከተማ<br>(2) ከፊልከተማ<br>(3) ገጠር<br>(4) ቤትየሌለ<br>(5) ሌላካለይገለጽ | |
| 6 | የታማሚውብሔር | (1) ሀድያ<br>(2) ጉራጌ<br>(3) ከምባታ<br>(4) አማራ<br>(5) ሌላይገለጽ | |
| 7 | የታማሚውየወርገቢ | | |
| 8 | የታማሚ አሁንእያሰሩያለብትየስራሁኔታ | (1) አርሶአደር<br>(2) ንግድ<br>(3) የመንግስትሰራተኛ<br>(4) ስራአጥ<br>(5) የቤትእመቤት<br>(6) ሌላይገለጽ | |
| 9 | በመጀመሪወጤናተቋ እንዲሄዱያደረጉምልክቶች | (1) ሳል<br>(2) ደምየቀላቀለሳል<br>(3) የትንፋሽማጠር<br>(4) የደረትወጋት<br>(5) ትኩሳት<br>(6) ድካም<br>(7) የክብደትመቀነስ<br>(8) የምግብፍላጎት | |

| | | | | |
|---|---|---|---|---|
| | | | መቀነስ<br>(9) ሌላ | |
| | 10 | በመጀመሪያየቲቢበሽታምልክቶችከታየበትእስከ ጤናተቋምለመሄድየፈጀበትጊዜ | (1) ቀን------<br>(2) ሳምንት<br>(3) ወር | |

| ተ.ቁ | መጠይቅ | ኮድ | ምላሽ |
|---|---|---|---|
| 11 | የመጀመሪያየቲቢምልክትከታየበትወ ደጤናተቋምየመጡበትጊዜዘግይቷል? | (1) አዎን<br>(2) አይደለም | |
| 12 | ዘግይተውየመጡከሆነየዘገዩበትምክን ያትምንድነው? | (1) ምርመራመፍራት<br>(2) ምልክቱበራሱጊዜይጠፋልብሎበማሰብ<br>(3) ብቸኝነትንበመፍራት<br>(4) በቂገንዘብባለመኖር/የጉዞ/<br>(5) በአቅራቢያውየጤናተቋምባለመኖሩ<br>(6) የተለያዩመዝናኛቦታዎችንበመሄድ<br>(7) ሌላ | |
| 13 | በመጀመሪያየጤናዕርዳታለማግኘትየ ሄዱበትየትነበር? | (1) ባሕላዊሕክምና<br>(2) መድሃኒትማከፋፈያ<br>(3) ጤናጣቢያ<br>(4) ሆስፒታል<br>(5) ራስንበራስየማከምአገልግሎት<br>(6) ፀሎትቤት<br>(7) ሌላ | |
| 14 | ወደዚያየሄዱበትምክንያት (ከቁ.13የቀጠለ) | (1) ፈውስስለሚያገኙ<br>(2) አገልግሎቱሁሌምስለሚገኝ<br>(3) በሪፈራል<br>(4) ነጻአገልግሎትስለሚገኝ<br>(5) በሌላሰውምክር<br>(6) ሌላ | |
| 15 | አንዳንድሰዎችወደጤናተቋምሄዶመ ታከምየማይፈልጉበትምክንያትምንሊ ሆንይችላል? | (1) ከቦታርቀት<br>(2) አገልግሎቱንቶሎስለማያገኙ<br>(3) ለህክምናየሚሆንበቂገንዘብስለማይገኝ<br>(4) በባህላዊ/በሀይማኖታዊመንገድድናለውብ ሎስለሚምኑ<br>(5) ከፋርማሲመድሃኒትስለምያገኙ<br>(6) ምልክቱበራሱጊዜይጠፋልብለውስለምገም ቱ<br>(7) ሌላ | |

**ለ/ የህሙማንየግንዛቤሁኔታንበሚመለከት**

| ተ.ቁ | መጠይቅ | ኮድ | ምላሽ |
|---|---|---|---|
| 17 | ስለሳንባነቀርሳ/ቲቢ/በሽታ ያውቃሉ? | (1) አዎን<br>(2) አይደለም<br>(3) አላውቅም | |
| 18 | የቲቢበሽታበጠምአደገኛእንደሆነያውቃሉ? | (1) አዎን<br>(2) አይደለም<br>(3) አላውቅም | |
| 19 | የቲቢመንስኤዎቹምንምንእንደሆነያውቃሉ? | (1) ኢንፌክሽን<br>(2) ቁጣ<br>(3) የማይወገድ<br>(4) አላውቅም | |
| 20 | አንድሰውበቲቢሕመምሲያዝየሚታዩምልክቶችምንድንናቸው?<br>(በዙምርጫሊኖርይችላል) | (1) ሁለትሳምንትናከዚያበላየሚቆይሳል<br>(2) ክባድትኩሳት<br>(3) ራስምታት<br>(4) የማታላብ<br>(5) የክብደትመቀነስ | |
| 21 | የቲቢበሽታመተላለፊያመንገዶችምንድንናቸው? | (1) አክታያለውሳልበአየርላይሲስል<br>(2) በመሳሳም<br>(3) ቲቢከያዘውሰውጋርአብሮመብላት<br>(4) አላውቅም | |
| 22 | ስለቲቢበሽታምርመራያውቃል? | (1) የአክታምርመራ<br>(2) የደረትጨረርምርመራ<br>(3) የደምምርመራ<br>(4) አላውቅም | |
| 23 | አንዳንድጊዜየቲቢበሽታሕክምናረጅምጊ | (1) አዎን | |

| | | | |
|---|---|---|---|
| | ዜይወስዳል | (2) አይደለም<br>(3) አላውቅም | |
| 24 | የቲቢበሽታሕክምናበነጻይሰጣል | (1) አዎን<br>(2) አይደለም<br>(3) አላውቅም | |
| 25 | ቲብአደገኛናገዳይበሽታነዉ | (1) አዎ<br>(2) አይደላም<br>(3) አላዉቅም | |
| 26 | ቲብአችአይቪ.ያባብሳል | (1) አዎን<br>(2) አይደላም<br>(3) አላዉቅም | |
| 27 | የቲቢበሽታንማከላከልይቻላል | (1) አዎ (2)አይደላም<br>3)አላዉቅም | |

## ሐ. ስለቲቢበሽታማግለልንበሚመለከት

| ተ.ቁ | መጠይቅ | ኮድ | ምላሽ |
|---|---|---|---|
| 29 | የቲቢበሽታስላለብንሌሎችንእፈራለሁኝ? | (1) በጣምአልስማማም<br>(2) እስማማለሁ<br>(3) አላውቅም<br>(4) እስማማለሁ<br>(5) በጣም እስማለዉ | |
| 30 | የቲቢምርመራስላደረኩኝእደበቃለሁኝ | (1) በጣምአልስማማለሁ<br>(2) አልስማማለሁ<br>(3) አላውቅም<br>(4) እስማማለዉ<br>(5) በጣም እስማማለዉ | |
| 31 | የቲቢበሽታከሌሎች ጋርበሚደረገውግንኙነትላይተጽዕኖያሳድራል | (1) በጣም አልስማማ<br>(2) አልስማማለሁ<br>(3) አላውቅም<br>(4) እስስማማም<br>(5) በጣምእስማማምለዉ | |
| 32 | የቲቢበሽታሕክምናረጅምጊዜስለሚወስድበጣምውድነው | (1) በጣምእስማማለሁ<br>(2) እስማማለሁ<br>(3) አላውቅም<br>(4) አልስማማም<br>(5) በጣምአልስማማም | |
| 33 | የቲቢበሽታየስራውጤታማነትንይቀንሳል | (1) በጣም አልስማማ<br>(2) አልስማማ<br>(3) አላውቅም<br>(4) እስማማምለዉ<br>(5) በጣም እስስማማምለዉ | |

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| 34 | የቲቢበሽታበቤተሰብግንኙነትላይተጽዕኖያሳድራል | (1) በጣምአስማማለሁ<br>(2) እስማማለሁ<br>(3) አላውቅም<br>(4) አልስማማም<br>(5) በጣምአልስማማም | |
| 35 | የትብ በሽታ የድህናት በሽታ ናዉ | (1) በጣምአስማማለሁ<br>(2) እስማማለሁ<br>(3) አላውቅም<br>(4) አልስማማም<br>(5) በጣምአልስማማም | |
| | ላትብ በሽታ ስላታማረመርኩኝ ለሎችን እፈራለሁኝ | (1) በጣምአስማማለሁ<br>(2) እስማማለሁ<br>(3) አላውቅም<br>(4) አልስማማም<br>(5በጣምአልስማማም | |

| | | | |
|---|---|---|---|
| 38 | የቲቢበሽታንበመጀመሪያየተመረመሩበትቀን | _____ | |
| 39 | የቲቢበሽታንበመጀመሪያየተመረመሩበትቀን | _____ | |
| 40 | ከምርመራበፊትስንትየጤናባለሙያዎችንአገኙ? | _____ | |
| 41 | የመጀመሪያምርመራያካሄዱትየትነው? | (1) የቲቢበሽታማዕከል<br>(2) የመጀመሪያደረጃህክምናማዕከል<br>(3) የሕዝብጤናተቋም<br>(4) ሆስፒታል<br>(5) የግልጤናታቋም<br>(6) ሌላ | |
| 42 | የቲቢበሽታምርመራያካሄደውባለሙያየሙያደረጃ ምንድነው? | (1) ስፔሻሊስት<br>(2) የውስጥደዌስፔሻሊስት<br>(3) ጠቅላላዶክተር<br>(4) ሌላ | |
| 43 | በሰዓቱበባለሙያየተወሰደእርምጃምንነበር? | (1) የአክታምርመራ<br>(2) የደረትምርመራ | |

| | | | |
|---|---|---|---|
| | | (3) ሪፈራል<br>(4) ሌላ | |
| 44 | የቲቢበሽታህክምናመድሃኒትየጀመሩበትቀን/ወር/ዓ/ም | | |
| 45 | ከሚኑሩበትእስካጤናተቋምድረስያለውየቦታርቀት/ | ኪ.ሜ--------<br>ሰዓት -------<br>ደቂቃ------- | |
| 46 | ከተመረመሩበትጊዜጀምሮመድሃኒትእስከጀመሩበትየፈጀበትጊዜ | (1) በቀን---------<br>(2) በሳምንት-------<br>(3) በወር-------- | |
| 47 | ለጥያቄቁጥር 41<br>መድሃኒትለመጀመርዘግይተዋል? | (1) አዎን<br>(2) አይደለም | አዎንከሆነወደ ቁጥር 43 ይዝለሉ |
| 48 | የቲቢበሽታህክምናበጊዜለመውሰድየዘገዩበትምክንያትምንድነው? | (1) በጤናጠቅምርቀትምክንያት<br>(2) በቂመድሃኒትባለመኖሩ<br>(3) በአገልግሎትመስጫቦታአገልግሎትእስኪገኙድረስ ለረጅምጊዜመቆየት<br>(4) የዘገየሪፈራል<br>(5) ባለሙያበወቅቱያለመገኘት<br>(6) ሌላመድሃኒትመጠቀም | |

**HADIYYISA QUESTIONARIAE**

| | | Xammicha | beyyimma | Dabbaccha |
|---|---|---|---|---|
| 1 | | TB jabbanchi ummuri | | |
| 2 | | Jabbanchi albbachi | (1). gonicho<br>(2). menticho | |
| 3 | | Hayyimanotti | (1). Protestanticho<br>(2). orthodoxa<br>(3). Muslima<br>(4). MK (kurre) ….. | |
| 4. | | Iddoxxi ummoo | (1). aggisakkohanne<br>(2). aggisubeeane<br>(3). tirrakko<br>(4) muulane | |
| 5 | | Hechchi beyyo | 1)berro<br>2) kolli bero<br>3 gaxxara<br>4) minni beeane<br>5)MK (kurre)……. | |
| 6 | | Jabbanchi shummo | 1) Hadiya<br>2) Gurage<br>3) Kambata<br>4) Amahara<br>5) MK (kurre)…… | |
| 7 | Agganni sixxoo | _____ | | |

| | | | |
|---|---|---|---|
| | Baxxi ummoo | (1). abbulancho<br>(2). Daderancho<br>(3). Addili baxxancho<br>(4). Adili baxxi beane<br>(5). Min ammatte<br>(6). MK(kurre). | |
| | | | |
| 9 | Luxxi ammane Suqqoi jabbi moamukki marreuwwi xigge(kurre) | (1). Kuxxichcha<br>(2). Biqqi qassimma<br>(3) foshshi hoffechcha<br>(4). ibbaa<br>(5). Malayyi hoggissimma<br>(6). killo xaaimma<br>(7). Hurbaxxi shennech bechcha<br>(8). MK (kure) _____ | |
| 10 | Luxxi suqqoi jabbo marre moamukkani fayyaommi mine warebbe massu ammani hinkkana | (1) balla _____ (2) santta_____<br>(3) agganna_____ | Awonno xammichanne hige |
| 11 | Ku ammmani hixxealla | 1-oyya<br>2-aaee | higee |
| 12 | TB marreuwwi moamma lasonne hanno matitto? | (1). Xenna tabiya (2). Qarralli mine (3). Xenna xabbiya<br>(4). Hospitalaa (5). Gaqqqi qarrali mine (6). Waaa unxxaxi mine | 1-oyya<br>2-aaee<br>3-mooyo |

| **xigoo** | Xammichcha | **kodduwwa** | **higge** |
|---|---|---|---|
| 13 | samba nekarissa bikkina laqqoi luwwi yohoniyye? | oyya…….1<br>lammoyyo…….2<br>esse moyyo……3 | |
| 14 | Suqqoi jabbi horiyemmi jorri kemmali jaboi ihukisa laqqqo? | Oyyaa……1<br>lammoyyo……2<br>Esse moyyo…….3 | |
| 15 | Suqoi jaboo ebbena xanno luwwi marichoo? | 4. Infectiona<br>5. Waai quniqqqa<br>6. Fayyobei jabboo<br>7. Anni laommoyo | |

| | | |
|---|---|---|
| 16 | Suqqoi jabbi marreuwwi maricho?<br>(Lammi hannai ihakko dabavhi heena xanokko) | 1 Lammi santi hanna ihakko kuxxichcha<br>2 ( 2)ibba<br>(3)Horoli damumma (4)xaqqafimma<br>(5 ) killo xaiimmma<br>(6) hurbaxxi hassani hoffecha |
| 17 | Suqqoi jabbi higgo goguwwi | (1) jabbi amadu manchi kuxximine<br>(2). Mateyanne hurbbatta ittimmine<br>(3). Xummatoo uwwumine<br>4). Mucurommi beei wooo hurbatta awaximmine<br>5. liubbe hurbbata awwaximmine<br>6 MK(kurre)……. |

| | | |
|---|---|---|
| 118 | Suqqoi jabbi mirmalli bikkina laqqaohoniyye? | Aqqixxxi mirimaarra.1<br>Carralli mirimarra…….2<br>Xiqqqi mirmarra…….3<br>laummoyyo…….4 |
| 20 | Suqqoi jabbi fayyeakkamissa laqqoo? | oyyaa……1<br>laommoyyo……2 |
| 21 | Matmatti TB jabbi qeralli amanni hikkimini massokko | oyya…….1<br>laommoyyo…….2<br>esse moyyoo….3 |
| 22 | Suqqoi jabbi miqqqoi beissa laqqohoniye | oyya……1<br>laommoyyo…….2<br>esse moyyyo…..3 |
| 23 | Suqqoi jabbi shohi jabbo | Oyya…. ….1<br>lammoyoo…….2<br>moissoyyo….3 |
| 24 | Suqqoi jabi HIV ummoo kemmalissa hawwisokko | oyya…….1<br>lammoyyo…….2<br>esse moyyoo…….3 |
| 25 | Suqqoi jabboo hollanchi xansisoissa laqhoniye? | oyya……1<br>lammoyyya…….2<br>esse moiyya……..3 |

## C. kanni worrani yoo xamichuwwi dabare

| | | |
|---|---|---|
| 26. TB jabbi yoobikkina igagga mulli mannissee baddommo | (1). Lobakatta itammomo<br>(2). ittamomo<br>(3). moyyya<br>(4). itammomoyyo<br>(5). Lobakatta itamomoyo | |
| 28. TB jabbi yoobikkina igagga mulli manni maxxommo. | (1) Lobakatta itammomo<br>(2). ittamomo<br>(3). moyyya<br>(4). itammomoyyo<br>(5). Lobakatta itamomoyo | |
| 29. suqqqoi jabbi mulli manni yokki mateyomma hawwodokko. | (1). Lobakatta itammomo<br>(2). ittamomo<br>(3). moyyya<br>(4). itammomoyyo<br>(5). Lobakatta itamomoyo | |
| 30. suqqoi jabbi qeralli ammani hikkimina massoi bikkina lobakkati birra xammokkoo. | 1). Lobakatta itammomo<br>(2). ittamomo<br>(3). moyyya<br>(4). itammomoyyo<br>(5). Lobakatta itamomoyo | |
| 31. TB jabbani ixxi gaga maxxokko. | 1). Lobakatta itammomo<br>(2). ittamomo<br>(3). moyyya<br>(4). itammomoyyo<br>(5). Lobakatta itamomoyo | |
| 33. suqqoi jabii baxxoo hawwodokko | 1 Lobakatta itammomo<br>(2). ittamomo<br>(3). moyyya<br>(4). itammomoyyo<br>(5). Lobakatta itamomoyo | |

| | | |
|---|---|---|
| 34. suqqoi jabbi mulli kenine yokki matteyomma hawwodokko. | 11 Lobakatta itammomo<br>(2). ittamomo<br>(3). moyyya<br>(4). itammomoyyo<br>(5). Lobakatta itamomoyo | |
| 36 suqqoi jabbi buxxi manni jabbo | 1). Lobakatta itammomo<br>(2). ittamomo<br>(3). moyyya<br>(4). itammomoyyo<br>(5). Lobakatta itamomoyo | |

## D. kanni worroni yoo xammich dabare

37.suqqoi jabbi mareuwwimoamukkaani mirmarra masiti ammi meeoo?_____balla.

38. suqqoi jabbi mirimarra issitenna illage meei fayyaommi manni mooantitoo: _____

39 suqqoi jabbo issitakkoi beyyi hinkitte?

**Fayyaommi mine kodda**

Suqqoi jabbi mine teimm sentera (0)

Worronni fayyommi minne (1)

Xenna xabauwwa (2)

Hospitalla (3)

Adilli fayyommi minyyo (4)

MK (kure) (5) _____

40. fayyaommi maani ayyaoayamo

2. specialistta
3. Internna
4. GP ii
5. MK (kurre) _____-

4.luxxi fayyaommi issu fayyommi marichcho issukoo:

1 akita mirmira

2. carrali mirmira

3. Referralla issakko

4 .MK (kure) _____

42 hinnka suqqoi jabbo sidamukkoki

(1) Qadafalli possativa (2) qadafalli negativa

| | | |
|---|---|---|
| 43 | Qarrare aserukki ayyamoo | ____/____/_____(balla/aggnna/hinchoo |

44.kinni gatti minnisse xenna xabbiyya affebbee masukki amnni hinkkana_____ Km. Or _____ sattaaa.

45 suqqoi jabboo mirmirra issitakohanni qarare ashetakkoi ammani hinkkanna?

(1) ballla_____ (2) sannitta_____ (3) agganna_____

46Kuu qarare ashetakkoi ammani qeralli ammani labohoniyy

(1) oyya (2) lammuyyo oyya yitakkoi ammani.

47 qarare ashetakohanisse qeralli ammane masukki mashikkai maricho? (lobakati dabbachi heeokko)

Xenna xabba qellomma (1) Goqqqi takki birr becha (2)

Qarari bechcha (3) Qeralli ammani masokko (4)

Qerralli ammani referlla (5)

Fayyaommi manni beechi masikka (6)

Mulli qarare massimma (7)

Mulli beyoo marriminete (8)

48. Hundemmi qerali ammni mateyyanemmi sadde onti ayyammo

(1) oyya(2) laummoyya

# THANKYOU!