

# Factors that influence services utilization, case detection and treatment delays among tuberculosis patients in Maputo-Mozambique

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Factors that influence services utilization, case detection and treatment delays among tuberculosis patients in Maputo-Mozambique.

Thesis submitted as part of the fulfilment of the requirement for the degree of Master of Public Health

By

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Mozambique

Declaration

I declare on my honor, that this master's thesis is the result of my personal research and guidance of my supervisor and co-supervisor. Its content is original, and all sources are properly documented in the notes, text, graphs, tables and final bibliography.

I declare that this work was not submitted in any other institution submitted for obtaining any academic degree.

.....  
Nordino Ibraimo Sulemane

The 52<sup>nd</sup> International Course in Health Development (ICHHD)

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Amsterdam, The Netherlands

Health is not everything, but everything is nothing without  
Health

(Arthur Schopenhauer)



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Finally to all that have not been mentioned, but directly or indirectly contributed to my degree as well to this work.

## **List of Abbreviations**

ANC	Anti natal Care
AFB	Acid Fast Bacilli
AIDS	Acquired Immune Deficiency Syndrome
ARV	Anti Retro Virus
BK	Bacilo de Koch
BMI	Body Mass Index
CHW	Community Health Workers
CMM	Conselho Municipal da Cidade de Maputo
CAG	Community Adherence Groups
CPT	Cotrimoxazole Preventive Treatment
DSCM	Direcção de Saúde da Cidade
DOTs	Directly Observed Treatment Strategy
GDP	Gross Domestic Product
FGD	Focus Group Discussion
HIV	Human-deficient Virus
NGO	Non-Governmental Organization
NLR	National Laboratory of Reference
MISAU	Ministério de Saúde
MAE	Ministério de Administração Estatal
MSF	Medicines Sans Frontiers
MTB	Mycobacterium Tuberculosis
MOH	Ministry of Health
MD	Medical Doctor
MDR	Multi Drug Resistant

MSM	Man having Sex with Man
INE	Instituto Nacional de Estatística
KIT	Royal Tropical Institute
PNCT	Programa Nacional de Combate á Tuberculose
PHD	Doctor Philosophy
PESS	Plano Estratégico de Saúde
PBT	Pulmonary Tuberculosis
PNDRHS Humanos de Saúde	Plano Nacional de Desenvolvimento dos Recursos
PNCT	Programa Nacional de Combate á Tuberculose
PESS	Plano Estratégico de Saúde
PBT	Pulmonary Tuberculosis
RNTCP	Revised National Tuberculosis Control Programme
SADC	Southern African Community Development
STI	Sexual Transmission Infectious
TB	Tuberculosis
TPM	Transportes Públicos de Maputo
USD	United States Dollar
UHC	Universal Health Coverage
UNAIDS	United Nations Aids
VU	Vrije Univesiteit
WHO	World Health Organization
WB	The World Bank
WFP	World Food Programme
XDR	Extensively Drug Resistant
ONDR	Observatório Nacional das Doenças Respiratórias
ECDC	European Centre for Disease Prevention and Control
DST	Drug Sensitive Tuberculosis

## **Glossary**

Services utilization, refers to the outcome of the interaction between patients and health providers (Donabedian 1973), cited by (Da Silva et al. 2011)

Case Detection, is when TB is diagnosed in a patient and is reported within the national surveillance system, and then to WHO. The case detection rate is calculated as the number of cases notified, divided by the number of cases estimated for that year, expressed as a percentage (WHO 2006).

Case Definition, a patient whom tuberculosis has been confirmed bacteriologically or diagnosed by a nurse or clinician based on clinical symptoms (WHO 2013). Cases are classified in pulmonary TB, in which the lesion is located in the lung parenchyma, or extra pulmonary if the lesion is located in other parts of the body beside the lungs (WHO 2013).

Patient delay is defined as the time interval between the onset of symptoms and first contact with the public healthcare services (Basnet et al. 2009).

Health system delay can be defined as the time interval between first contact of the patient with the health care system and initiation of TB treatment. Delay is normally measured in days (Saifodine et al. 2013).

## **Abstract**

**Background-** Tuberculosis is a disease of public health importance in Maputo, and remains one of the leading causes of morbidity and mortality in the general population, despite increased control efforts. Among the most vulnerable groups, young people and adults stand out between 15 to 49 years of age, children under five and people living with HIV and AIDS.

**Objective-** Explore factors that influence services utilization, detection and treatment delays among tuberculosis patients in Maputo, aiming to formulate recommendations and to respond to the constraints and challenges identified.

**Methodology-** for development of this paper, literature review was used, published and unpublished reports and discussions with medical staff from the field and those involved in TB programmes in Maputo. A conceptual framework related to health seeking behaviour adapted from Rundi and Piot models.

**Results-** Findings shows that from provider's side there is a lack of skilled and motivated staff to diagnose and treat TB. Open hours, services not friendly, lack of confidentiality, stock outs, gaps (distance) between clinicians and patients. Communication barriers between health professionals, TB patients and community in the health units are the factors influencing patients mistrusting the public health services. From the user's side, patients have many other priorities than health due to poverty. The main aim is to survive each day for food and shelter for them and children. Lack and costs of transport, local cultural perceptions, lack of knowledge about TB, are detrimental. Power relation to decide when and how to use health services for women, are the leading causes for people not using health services to be detected and treated on time.

**Conclusion-** The combinations of factors are detrimental for people when deciding to use the public health services. All the factors make the situation of patients, when ill or onset symptoms of TB, worsen. Inefficiency of health systems, and services provision is the most important factor for people not using the public health services. These, will lead to using the services that offer better conditions and are more accessible to them, such as traditional healers, church leaders, private clinics and drug sellers for self-medication.

**Recommendations-** Consultations and health messages have to be patient focused and based on the individual patient's needs. The interaction between health professionals has to be as horizontal as possible. The local health policies have to focus on the local specific issues, regarding each population location and beliefs. Above all, political commitment is the key to make all the interventions feasible and practical.

**Keywords-**Tuberculosis, case detection, services utilization, Maputo-Mozambique, treatment Delay.

**Word count-**12.000

## **Introduction and structure of the thesis**

Tuberculosis (TB) is a global major public health problem. TB is an airborne, infectious disease caused by bacteria, which primarily affect the lungs, although it can affect other sites of the body (extra-pulmonary TB). Approximately one third of the world's population carries the TB bacteria *Mycobacterium TB* (MTB) (Viegas et al. 2015) The World Health Organization (WHO) declared TB as a global emergence and public health concern in 1993. Although TB is a treatable and curable disease, it ranks as the second leading cause of death among infectious diseases. Every year almost 2 million people die worldwide due to TB and most deaths occur in low-and middle-income countries (Chowdhury 2014).

Tuberculosis takes advantage of individuals with low immune systems, which is why it is called an opportunistic infectious disease. Consequently, the risk of TB infection is higher among the people who are HIV positive, diabetes, cancer, hypertension and much other pathologies that lower the immune status (Garcia 2014).

Tuberculosis remains an important public health problem, especially in developing countries. The African region has more than a quarter of all TB cases reported worldwide, and is the only continent where the rate of infection, by this disease, increases, despite of implementation of effective strategies to fight it (PNCT 2014). In Mozambique the burden of TB is still a major public health concern. The WHO TB report shows the TB incidence rate is 431 per 100.000 inhabitants and the TB mortality rate is 129 per 27.216.000 inhabitants per year (WHO 2015). Maputo is one of the provinces which contributes most to the TB burden in the country. In 2014, Maputo contributed 5575 new cases per 100.000 population and 99 deaths. (TB facts 2015).

To reverse the scenario, several mechanisms were triggered by the Ministry of Health (MoH). Among these are the community based approaches, the strengthening of qualified human resources, procurement and implementation of new diagnostic technologies (GeneXpert). Free availability of quality drugs to improve the treatment of patients suffering of tuberculosis. All of this with the aim of cutting the transmission cycle of disease (Vitoria et al. 2009). Despite these efforts described above, the situation tends to worsen.

Before joining KIT, I worked for Doctors without Borders in Maputo-Mozambique, as a Patient Support Activities Manager on TB and HIV context. I was in charge of 15 counsellors, distributed into five public health centres supported by the organization. Being in the field and each day facing patients arriving in their advanced stage of TB, raised a question: why do people delay until the situation gets worse. Since then, I wanted to further investigate the main causes of this delays on detection and treatment. Furthermore, infectious

diseases such as TB are a major public health problem in Maputo but it lacks attention in terms of operational research. Finally, infectious disease control is the field that I want to specialize in more in the future, preferable through a PhD.

The present study, aims to review and explore the factors influencing people not to be promptly detected and treated, from both the users and providers side. For better building of the findings, the review is based on the health belief conceptual framework which is described below in the methodology. The paper is divided into 6 chapters:

Chapter 1: Background information of Maputo province

Chapter 2: Problem statement, justification, objectives and methodology

Chapter 3: Factors influencing utilization, case detection and treatment from the users and providers perspective in Maputo;

Chapter 4: Good Practice in early detection and treatment provision in other contexts and countries;

Chapter 5: Discussion of the findings regarding factors influencing detection and treatment delays;

Chapter 6: Conclusions and Recommendations.

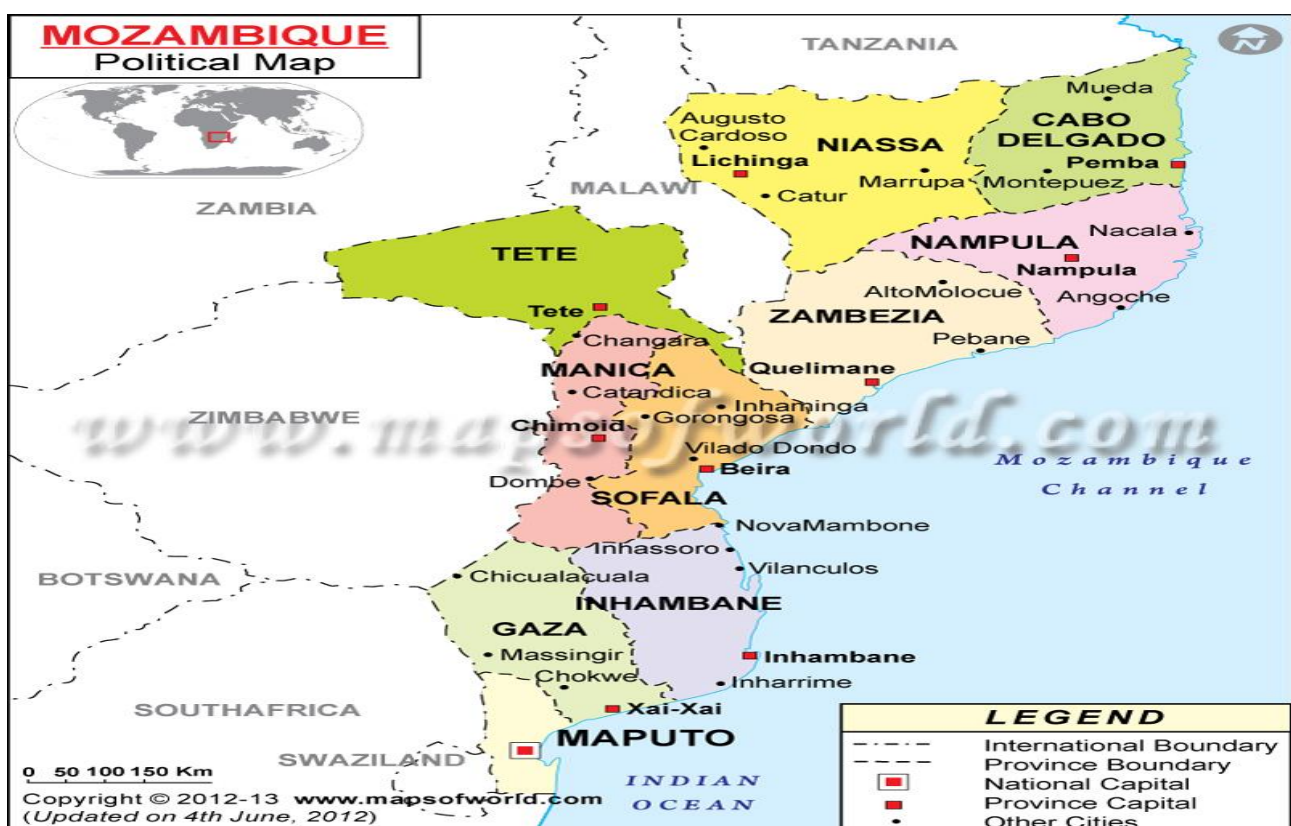
## CHAPTER 1: BACKGROUND

### 1.1. Geography

Maputo is located on the west side of Maputo Bay, at the estuary mouth of the Tembe River at the Indian Ocean in southeast Africa, about 60 km east of the border triangle of South Africa, Swaziland and Mozambique. See the map below (fig 1). Maputo is the capital city of Mozambique (Maputo 2010)

The Province is divided into seven Urban Districts: KaMpfumu, KaMavota, Nihamankulu, KaNyaka, KaMaxakeni and KaMubukwana, which again are subdivided into neighbourhoods, (INE 2007).

**Figure 1:** Geographic location of Maputo province



Source: [www.google.com](http://www.google.com)

### 1.2. Transport and Mobility

The demographic increase in Maputo has resulted in a transport crisis that increases day after day, with long traffic queues and waiting at peak times. The public transport system in Maputo is poor (Mendonça 2012). Lack of transport and the degradation of roads has directly influenced the life of the citizens. It jeopardizes the local development and access to services (Paulo & Tvedten 2007).

### 1.3. Population

Maputo has an estimated population of about 1.5 million inhabitants (Index Mundus 2015). It is one of the 15 largest urban areas in sub-Saharan Africa. Most of the population live in informal or unplanned settlements, located along



highways and railway lines or beside polluting industries. This is a serious risk factor and threat for health. (Anderson & Jekins 2011).

#### 1.4. Education

Education is a determinant tool for improving life of people. The UNESCO argue that is “fundamental to the realization of the civil, political, economic and social rights, as well as to reduce inequalities in a population” (Mario & Nianja 2005). According to national statistics data, 9.8% of the population in Maputo is illiterate and can neither read nor write. The Municipal Districts of Kanyaka (26.1%) and Katembe (19.7%) have respectively higher provincial illiteracy rates than recorded in the municipal district KaMpfumu (2.2%). Overall, illiteracy rates are higher among women than among men (INE 2010).

#### 1.5. Socio economy

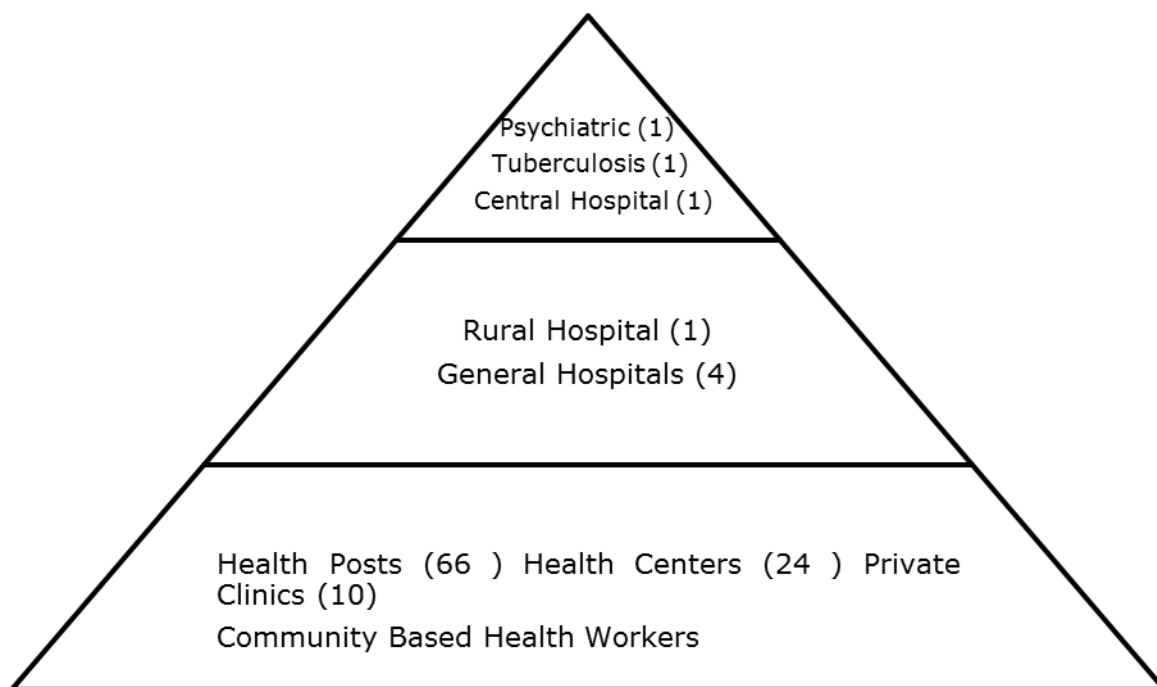
Maputo has the same challenges as other Mozambican cities: garbage not collected, poor roads, and poor drainage (INE 2010). The informal settlements that dominate the city, are also in a poor state, with many located near, or in floodplains. A majority of the capital’s inhabitants are at risk of natural hazards like floods and landslides. Subsistence agriculture, informal commerce are more dominant in the rural settings of Maputo (UN-HABITAT 2010).

#### 1.6. Health systems in Maputo

##### 1.6.1. Health system

Health services are almost free of charge available throughout the network to all population in the national health system. The health system, in terms of structure, and health facilities available in Maputo (fig.2) follows the WHO pyramid (MISAU 2013).

**Figure 2:** Structure and number of health facilities available in Maputo.



Source: Ministry of Health of Mozambique 2012

### 1.6.2. Health workforce and challenges

The Government is in the process of decentralization within the public sector reforms (DSC 2014). The production of human resources for health, still does not meet the needs of the population (Fieno et al. 2016). Alongside Tanzania, Mozambique has one of the worst shortages of health workforce in Southern African countries. See the table 1 below, that shows the ratios of physicians per population in some Southern African countries including Mozambique (The CIA 2016). In Maputo similar problems are faced at the country level.

Beside the shortage of health workforce, Maputo still faces poor performance, inequitable distribution; poor logistics of medicines and other medical items, which result in frequent stock-outs. Thus, affecting the quality of health services, and consequently the life of population, mainly for poor located in rural areas (WHO 2016).

Among these problems, health workers and managers highlight poor working conditions, lack of biosecurity, non-implementation of careers, an inadequate policy incentives to the different realities of the province. Additionally, no implementation of the current incentives policy, lack of access to training, delays in the processing of personnel documents. lack of strong leadership in the sector, and inequalities between urban and rural areas (PNDRHS 2008-2015).

**Table 1:** Ratio of physician to population in some Southern African states

	<b>Country</b>	<b>Ratio(1 doctor/1000)</b>	
1	Zambia	0,17	2012
2	Zimbabwe	0,08	2011
3	Mozambique	0,04	2012
4	South Africa	0,78	2013
5	Tanzania	0,03	2012
6	Swaziland	0,17	2009

Source: [www.cia.gov](http://www.cia.gov)

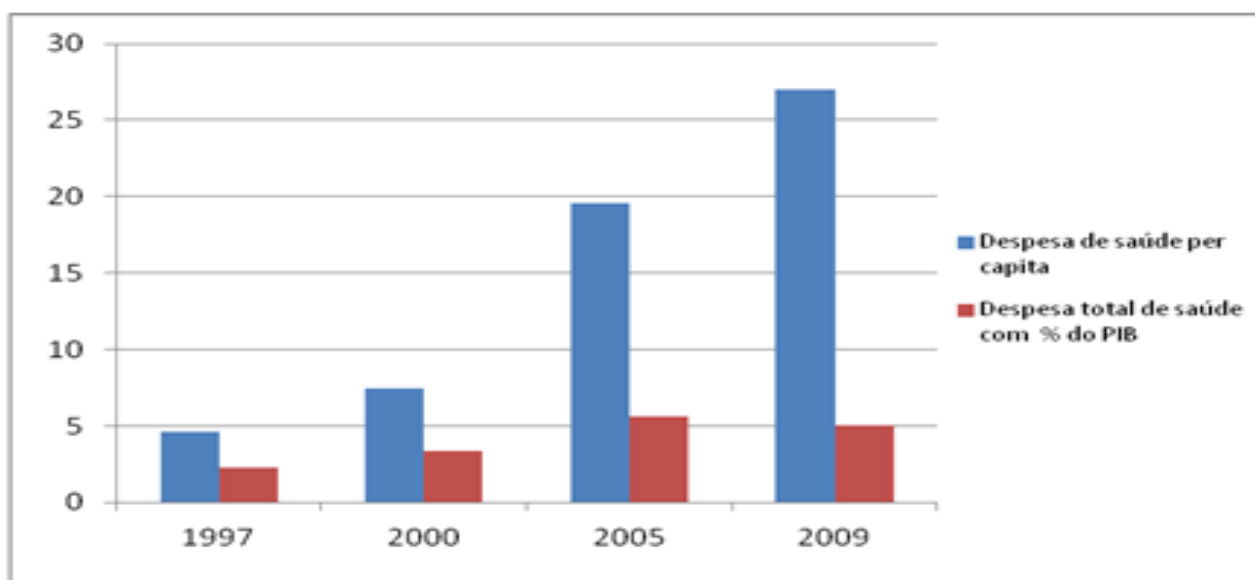
### 1.6.3. Health Financing Mechanisms

The total health expenditure in Maputo is based on the country level on funding collection and divided into provinces according to the needs (UNICEF 2015). It is characterized by internal and external funding: State budget (18%), development partners (66%), and user fees payment (16%) (WHO2011). The health sector is systematically underfunded and dependent on external resources. In recent years, the situation worsened due to the decrease in these funds, and inefficiencies in the allocation and use of scarce resources (MISAU 2013).

According to the UNICEF budget report (2015), the country spends only US\$ 43 per capita per year, compared to US\$ 237 per capita average in Southern African Development Community (SADC) regions.

Mozambique has made significant progress in increasing the proportion of the gross domestic product (GDP) allocated to health and the increase in public spending to achieve the Abuja commitment. Total health expenditure, as a percentage of GDP, rose from 2.3 percent in 1997 to 5.65 percent in 2009. However, these resources are still not enough for the health sector needs. The government must increase its domestic collection mechanisms, and reduce foreign assistance in the state budget, and grow up to 15% to meet the commitment made in Abuja (WHO 2011).

**Figure 3:** Trends of health expenditure per capita and by percentage of GDP from 1997 to 2009.



**Source:** Mozambique Health Financing (WHO 2011).

#### 1.6.4. Health Status and trends

The life expectancy in Maputo rose significantly, from 42 years in 1997 to 53.1 in 2011. The province continues to be affected by an epidemiological profile dominated by communicable diseases such as malaria, HIV, tuberculosis, and Non-communicable diseases (MISAU 2013).

## **CHAPTER 2: Problem Statement, Justification, Objectives and Methodology**

### **2.1. Problem Statement**

Maputo is one of the most affected provinces in Mozambique, concerning TB mainly, due to the high prevalence of HIV (19.8%) and the high mobility of people and other factors such as poverty (MISAU 2016).

Tuberculosis is a disease of public health importance in Maputo, which is one of the leading causes of morbidity and mortality of the general population. Among the most vulnerable groups, young people and adults stand out between 15 to 49 years of age, children and people living with HIV and AIDS (MISAU 2012).

In 2015, the general notification in Maputo Province was about 6556, with 5575 new cases and 981 relapses, less than estimated 7600 per 100.000 inhabitants. Case detection rate in children was 441 which is less than the estimated 841 children. In addition, the cure rate continues to be low 78% then the estimated goal of 87%. In the same year alone, Maputo recorded 99 deaths due to TB and lost to follow up on 11% (DSC 2015). These figures show the deficiencies on case finding, treatment provision and follow up of patients.

TB control is based on the rapid identification of cases and their effective treatment. The rapid identification of cases depends, on one side, on patients promptly recognizing TB symptoms and seeking appropriate health care, and on the other side on the capacity of the health care system to diagnose and treat the disease.

Delays in diagnosis and treatment of TB have important individual and public health implications. At individual level, patients experiencing long delays in initiation of treatment may have an increased risk of developing disease complications and death. At public health level, these delays may increase TB incidence by increasing the duration in which transmission can take place (Saifodine et al. 2013).

Timely detection and engagement into care, among those with symptoms of tuberculosis (TB), and proper treatment for whom diagnosed with TB, remains a large challenge in Maputo (Fonn 2007).

### **2.2. Justification**

More cases are identified due to improvements in case finding, but despite this, there are still gaps in services utilization, case detection and cure rates.

Detection is essential for starting the cascade of medical and interventions designed to improve the patient health and reduce their infectiousness, resulting in lower rates of transmission to their family members and improves the patient outcomes (Lawn et al. 2012).

A study conducted by Saifodine et al. (2013) in Beira (the second largest city of Mozambique), has shown that there are important delays in TB diagnosis and treatment. Those delays are caused both by patients and by the health care system.

Tuberculosis is a disease that was declared a public health challenge in Maputo in 1990. Since then, it has received much attention in terms of financing for interventions and control strategies. Nevertheless, it remains a threat for the general population.

The current situation of tuberculosis, in which only half of the population of Maputo has access to health care, raises a number of questions on which this thesis will focus:

- What do patients do when they are ill?
- Where do they go?
- Why do they delay on seeking help?
- Why do they do not use the public health services?

### **2.3.Objectives**

The general objective of this thesis is to explore factors influencing services utilization, detection and treatment delays amongst TB patients in Maputo.

#### **Specific objectives:**

- Describe and analyse the epidemiological situation of TB and its trends in Maputo, including its interactions with HIV.
- Critically analyse the providers and users side factors, influencing utilisation case detection and cure of detected TB patients in Maputo.
- Review good practices in improving utilisation, case detection and treatment provision in other contexts and countries.
- Formulate recommendations to respond to the constraints and challenges identified, in order to address awareness and health seeking behaviours of TB patients and a proper response by the Maputo local health system.

## **2.4. Methodology: Conceptual Framework and Search Strategy**

### **2.4.1. Conceptual Framework**

Based on work in East-Malaysia, Christina Rundi conducted a study to investigate perceptions, health seeking behaviour on TB patients and the community. The study aimed to examine their experiences on the healthcare services in Sabah. In order to achieve the main objective, Rundi developed an own conceptual framework.

For the study Rundi used a conceptual framework that was based on aspects from other frameworks such as: health belief model, health care, utilization model, the four A<sup>s</sup> and the pathway model. The aim of this combination was to find out about the people's perceptions on severity and benefits to medical choices.

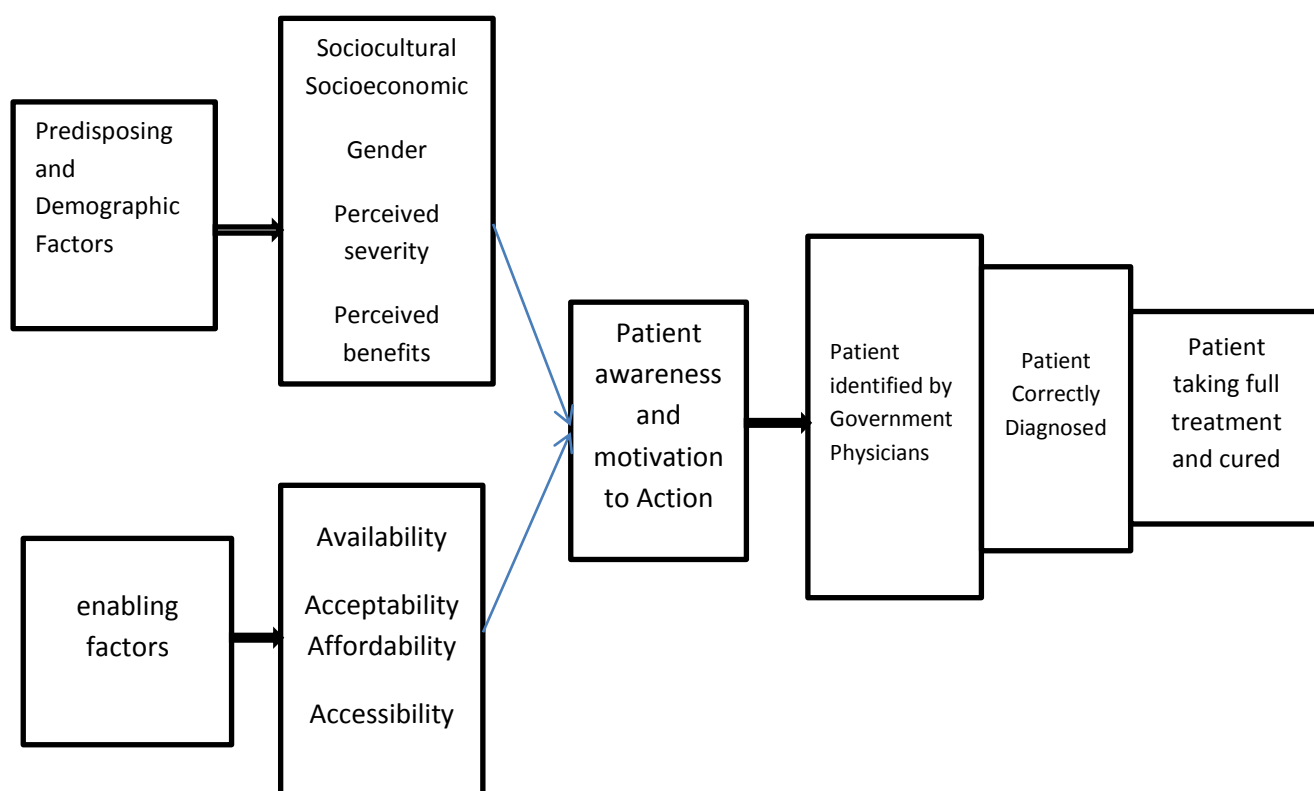
According to Rundi (2010), these perceptions may be influenced by socioeconomic, gender and psychological factors. Enabling factors might be linked with the four A<sup>s</sup> (Accessibility, Availability, Acceptability, Affordability). In the context of Maputo, this paper intends to explore factors that influence services utilization, detection and treatment delays on TB patients.

Thus, the choice of using the Rundi model to guide on how people perceive and react about TB in Maputo. The Rundi model fails to focus on detection and treatment provision, so it is better combined with the Piot model. Apart from community perspective, Piot focuses as well on the health providers side.

Piot Model focus in the course of patient when symptoms are identified and the patient decides to seek help at public health units. Piot propose six steps for TB case management: Patient awareness, motivation, diagnostic process, treatment provision, adherence, efficacy of drugs and cure. It has proven that the model is useful for analyse disease prevention and care programs (Mumba et al. 2003). This model, helps to understand where interventions are problematic or are failing to patients complete successfully all the steps proposed.

In order to build the findings in this paper, the author made his own conceptual framework (fig.4) based on aspects from Rundi and Piot models. Based on the study questions and objectives, the paper will focus on predisposing, socio-demographic, and enabling factors (Availability, Accessibility, Acceptability, Affordability). These factors are influenced by aspects such as: socioeconomic status, sociocultural perceptions, gender norms and health systems.

**Figure 4:** Behaviour Conceptual Framework



Source: Adapted by the author based on Rundi and Piot models.

#### **2.4.2. Search strategy and Table**

For further exploration and analyse of health services utilization, detection and treatment delays for TB patients, systematic search for literature review was used. Internet search using different platforms such as Google Scholar, PubMed, MOH websites, unpublished reports, grey literature, Vrije and KIT library and databases, were used. For better understanding of real facts on the field, the author discussed with the medical staff involved in TB programs in Maputo. Google Scholar with Boolean operators "AND", "OR" were used as well.

Key words for the search: Tuberculosis, Mozambique, Maputo, gender, cultural beliefs and practices, anthropology and sociology, health services, Socio demographic, socio economic status, predisposing factors, self-medication, demographic factors, availability, accessibility, affordability, acceptability, epidemiology, treatment delays, detection, food insecurity, TB in Afghanistan, peer educators, TB in India, TB in Portugal, screening, TB strains of TB, burden of TB, TB diagnose. Beside English the search was expanded to Portuguese literature review.

**Table 2: strategy how words were used for searching using different platforms and websites for each objective.**

Search Sources	Objective 1	Objective 2	Objective 3	Objective 4
	Describe and analyse the epidemiological situation of TB and its trends in Maputo including its interaction with HIV.	Critically analyse from the users factors influencing utilization of health services to be detected and treated.	Critically analyse the providers factors influencing case detection and treatment delays on TB patients.	Review good practices in case detection and treatment provision from other contexts and countries.
Local MoH/MSF websites and Unpublished reports	Tuberculosis, Transmission, Immune System, Strains of TB, TB "AND" trends	TB symptoms, traditional leaders/healers, Identification of TB symptoms, Gaps rural urban, TB patients, Transport in Maputo,	Co-infection, treatment AND food, Health systems, public health, private for profit, private no profit, screening of TB, symptoms of TB, patients and clinicians, delays, suspected cases, diagnoses, treatment initiation, DOT strategy, stock outs, community approaches.	
PLOS, Pubmed, KIT-database Google Scholers  Vu Library	Pulmonary Tuberculosis, risk factors of TB,	Predisposing factors, Socio demographic factors, enabling factors, Cultural beliefs of TB, health conditions, TB impact, TB and Hiv association, mines, community	Case detection, rural urban, M. tuberculosis, NGOs and TB, TB treatment, health seeking, health care, availability, accessibility, acceptability, availability.	TB cases India, peer educators India, TB diagnose, DOTS, detection and cure rates, TB in Portugal, cases of TB in Portugal,
WHO websites, UN, World Bank	Tuberculosis "AND" HIV, burden of tuberculosis, cases of Tuberculosis, HIV	Power relations, gender and TB in Maputo, progression of TB between man and women, differences on TB symptoms.	One stop TB, Services for TB, Pulmonary TB, case definition, DOT strategy, health promotion, health units in Mozambique, TB drugs, Community Health Workers.	Early detection, case finding, community screening, burden of TB Afghanistan, food insecurity, food support, nutrition, challenges of TB in Portugal, tracing "AND" screening.

### 2.4.3. Selection criteria of articles and studies

Studies conducted in the countries and provinces with similarities to Maputo, Mozambique, with enough study sample size and considerable literature review were selected and used in this paper. Time period from 2000 to 2016, and only articles written in English and Portuguese. Unpublished articles based on the local data collection from the local MoH (MISAU) and reliable national and international NGOs were also used.



#### **2.4.4. Limitations of the literature review**

Many of the articles related to TB are mentioned through country level, not focusing on Maputo only. The author have used literature from other countries in order to support the local findings. This may lead into inaccuracies in the final conclusions and recommendations.

## **Chapter 3: Findings**

The findings were built based on the specific objectives, study questions and conceptual framework. Each factor is analysed separately in the following sections and later discussed in the scenario of Maputo.

### **3.1. Epidemiology of tuberculosis in Maputo.**

Despite the decline in mortality in the last 20 years, tuberculosis is still the second leading cause of death worldwide. It causes illness among millions of people each year and ranks alongside the human immunodeficiency virus (HIV) as a leading cause of death worldwide (WHO 2016).

In 2014, there were an estimated 9.6 million new TB cases, 5.4 million men, 3.2 million women and 1.0 million children. There were also 1.5 million TB deaths (1.1 million among HIV-negative people and 0.4 million among HIV-positive people), approximately 890 000 were men, 480 000 were women and 140 000 were children (WHO 2015).

Maputo does not escape the rule. Alongside HIV, TB is the leading cause of death and disability. Only in 2015 it caused 99 deaths and 5575 new infections (DSC 2015). Tuberculosis is a disease that is transmitted from person to person through droplets in the air when a person with TB, coughs, sighs, talks or spits, mainly indoors and overcrowding, such as waiting rooms and public transport (Misau 2012). In addition, it was previously attributed to factors such as housing, work, poor nutrition for infection and development of active tuberculosis. With the emergence of HIV in 1990ies, the situation has changed completely, with many people with HIV and developing TB due to the weakening of the immune system.

Data from the WHO, shows that people living with HIV/AIDS, have a much higher chance (10% per year) to develop active TB, compared to HIV-negative people (10% in a life time). In Maputo, there are hardly any studies examining other system weakening factors such as diabetes, cancer, poor nutrition as well as various other diseases that can influence the development of active tuberculosis. In the transmission of TB, several agents are held accountable. Control and design of interventions of the disease it is important that its genesis is understood. A study conducted by Viegas et al. (2015), in the central hospital of Maputo, shows that *M. tuberculosis* is the most common causative agent of tuberculosis, in this case, pulmonary tuberculosis. The study recommends that more research is needed to identify other types of TB as well as extra pulmonary. Particularly the attention in rural areas, where people are in greater contact with cattle, can probably be a risk factor of transmission due to direct consumption of contaminated meat, unpasteurized milk and other derivatives of cow (Viegas et al. 2015).

### **3.2. Trends**

Till 2003, Maputo faced only drug sensitive TB (WHO 2011). In the last 10 years however, drug-resistant is on the rise, due to poor adherence caused by factors related to the health system. Poor availability and quality of drugs, poor quality of services, as well as the patients themselves, such as distances, side

effects of drugs, financial problems and many others, might be behind resistance to the first line TB drugs. At the end of December 2015, Maputo had the cohort of 118 MDR. Since the period of treatment is even more lengthy and complicated, it will lead into more dropouts of treatment and therefore the development of new strains of XDR (Tommasi 2016).

The emergence of new strains of TB impose a greater risk for the local communities and health authorities, were people are at risk of being infected with more bacilli who are resistant to drugs.

In 2013 alone, 23 cases of XDR were identified of which 8 have died; 15 are currently being monitored, since there is yet no cure available in Mozambique (MSF 2016). It is emphasized that one of the 15 people infected with XDR, is a health professional, which shows great importance to improvement of preventive measures of health professionals, not only those who are dealing directly with tuberculosis but overall.

### **3.3. Predisposing and Demographic factors**

Predisposing and Demographic factors are influenced by characteristics such as age, gender, genetic, attitude, environment, social status, illiteracy, family and ethnicity. In the scenario of Maputo, cultural beliefs, gender and socioeconomic status are the main factors that influence perceptions and decisions regarding tuberculosis (Rundi 2010).

#### **33.1. Socio Cultural Factors**

The social dynamic and cultural beliefs are one of the most important contributions in how people seek help when they are facing any kind of disease (Passador & Omar 2006). Regarding to TB, in Maputo there are beliefs and perceptions about how it can be acquired. One belief is that only a man can get TB, by having sex with a widow, who was not traditionally purified (Langa et al. 2013). Therefore, when a man starts with Tb symptoms, such as coughing for more than 2 or 3 weeks, followed by body losing weight, night sweating (Voskens 2013), the first attitude of the individual either household members is to seek help with the local traditional healers, and religious leaders.

The second common belief is that a man who gets TB had intercourse with women in the menstrual cycle without the use of condom, leading to self-medication with home remedies or buying at the local drug sellers to cure the disease. These beliefs, might have influence in the awareness and recognition of TB symptoms and consequently, late decision making of the family members to seek help in the health facilities (Shaikh & Hatcher 2004).

In order to overcome this situation, the Direccção de Saúde da Cidade de Maputo (DSC), has been working alongside the traditional healers, and community leaders through health education to increase awareness, regarding TB symptoms and what interventions, if cases are identified in the community. From 2014 to 2015, the DSC have trained 30 traditional healers, representing all 7 districts of Maputo, in identification and recognition of symptoms for patients with possible TB and how to refer to the nearest healthcare facility.

After the training, in 2015, 17 suspected cases were referred by traditional healers, which 5 diagnosed for TB and 7 tested HIV positive (DSCM 2015).

This intervention, regarding the traditional healers involvement, has shown effective for the local health authorities (Banerjee et al.2004) although it has not been done continuously, due to a poor management system for better supervision and monitoring of activities. It is important to note that in the past decades, the local practices, of having traditional healers as a first contact in case of illness, were reserved only for people from rural areas, illiterate and with lower economic status (Meneses et al. 1991). Nowadays, the situation has changed dramatically, due to the emergence of HIV and its association with TB. Even people with a higher education, members from the local government, still seek help through traditional and religious leaders instead of visiting a health facility because of stigma (Meneses 2001).

From the past, in the 1970ies there was always a great migration of the southern zone, especially from Maputo and Gaza to the gold mines in the neighbor country South Africa (Sousa 2014). In the recent decades, the situation has changed. Many miners return to Mozambique infected with TB/ HIV due to the high prevalence of TB / HIV in South Africa (TB FACTS 2015). A study conducted by the MoH of Mozambique/San Francisco University in 2014, shows that 22,3% of 30.000 miners from Mozambique in South Africa are infected by HIV.

In the local perception of Maputo, when a family member comes back with signs and symptoms of TB, it is then associated with the fact of having worked a long time in the mines, inhaling dust and gases, which may have caused his illness (Silva 2013). Many die in the community without accessing health services with unknown diagnose. For who manage to access health services, end up being diagnosed DS TB either MDR TB, in many cases associated with HIV.

### **3.3.3. Gender Norms and Tuberculosis in Maputo**

Mozambique, especially Maputo, has made significant achievements in terms of gender distribution in the local sphere of labour, where 62 % of employed are represented by women (World Bank 2000). Despite these improvements, gender inequality still plays a big role in decision making in seeking health services when needed (Guerra 2014).

Regarding to case notification between man and woman, there are differences. Due to biological constitution, imbalances in power relation and roles that influence risk factors of TB and final decision to seek help in the nearest health unit (WHO 2003). In addition, the way symptoms are presented, in both sexes male and female, are quite different. Where some studies reported by WHO, argue that women produce less coughs than man or even test positive for tubercle bacilli sputum microscopy (WHO 2003).

As a result, associated with the decision making, and less visible onset symptoms for women, may contribute to seeking help on time (Sen & Ostlin 2010).The stigma regarding TB is more significant for women than man, being

that women are more embarrassed for having the disease, therefore preferring to seek help from traditional healers, religious leaders, drug sellers or self-medication (Duarte de Sá et al. 2012).

Studies reported by the WHO (2003), suggest that the overall prevalence of pulmonary TB is much lower in women, but, progression from latent to active, as well as case fatality rates, are higher in women of reproductive age than male in the same age range. In Maputo this age group represent 50% of the total population, with median age of 16.8.

Tuberculosis has a different impact in women compared to man (CDC 2011). In pregnancy for instance, if symptoms are not recognized and proper diagnosed on time, it might lead to poor pregnancy outcomes such as risk of prematurity, low birth weight in the new born, perinatal deaths (Loto & Awowole 2012). In case the disease is located extra pulmonary (genital organs), it may lead to infertility in women, therefore, having negative consequences in the society, such as shame and loss of marriage.

Detected cases of TB, have a treatment paradox between both sexes. Men are less likely to complete the treatment even if they are accessing more the health units, while women who access and initiate the treatment are more likely to complete successfully, compared to men (WHO 2003). These differences are justified by men unable to attend daily visits for DOTs due to earn their livelihood.

The community, family and civil society as institutions, have always undermined the prestige and recognition of women in the household care. Only education and empowerment of women can change the course of the current situation in Maputo, and can bring respect, social freedom and a decision making authority within the household context.

#### **3.3.4. Socio-Economic Factors**

One of the most important socioeconomic factors in Maputo, are poverty, food insecurity, living conditions, low access to clean water, poor hygiene and sanitation. Lower levels of education mainly for women, corruption and many others (UN-HABITAT 2010). These factors impact on the willingness and capacity of people to participate actively in seeking health services (Shahid et al. 2016). In Maputo, 70% of the population live in the rural and periphery called "zona de caniço" due to its composition of precarious material. During the rainy season (December to March), houses are filled with water and the roads are flooded, making traffic almost impossible. They spend six months or even more to be concerned about how to overcome or survive in this situation. What somehow, endangers their health conditions, especially in cases of patients already debilitated either in healthcare needs, the risk is even higher (Paulo, Rosario, Tvedten 2006-2011).

There is a big gap between the urban and rural part of Maputo, in availability of resources. In the city area the situation is better, where the public health sector is most concentrated and private provision is more available in the urban area (Nhampoca 2013). In the rural settings the situation is more worse,

where, apart from the situation mentioned above, people face lack of public transport, high levels of unemployment. Many are in the informal sector and farmers and living under poverty line of less than 1 dollar per day. Many of them live more than a one hour walk to the nearest hospital. There is 1 health facility per 5000 population and only 1 technician available per 1600 residents and 1 bed for 655 inhabitants (MAE 2005).

All this is a contributing factor in how people make choices and decisions to seek health services when they are ill. This leads to financial catastrophes and consequently more impoverishment of local households and individuals, because they have to sell their assets to be able to pay for direct and indirect (transport and food) costs of health (Jacobs et al. 2012).

Socioeconomic status and poverty, not only excludes people from the benefits of healthcare system, but also restricts them from participating in decisions that affect their health, resulting in greater health inequalities between poor and well off people.

In Maputo the education level has been seen has an important factor for decision making, to seek help in medical choices such as traditional healers and self-medication. A study conducted by ALI et al. (2006) in mental illness in Pakistan, has shown that education had a significant association with health services utilization behaviour.

### **3.4. Enabling Factors**

Enabling factors for services utilization, detection and treatment delays are influenced by geographic accessibility, availability, affordability, acceptability and accommodation of health services.

#### **3.4.1. Geographic Accessibility of Health Services**

The most common barriers of accessing health care in Maputo are costs of transportation, long distances walk, lack of transportation, and poor health units (Matine 2014). One example of this situation is people living in Inhaka and Katembe districts. Where to get into the urban have to rely on boats. In Inhaka the boat crosses only once a day and takes more than four hours from Inhaka to Maputo city (MAE 2005). Once the services are more concentrated in the capital city if people are facing any situation or emergency have to deal with this challenges.

Lack of access to health services often has impacts beyond the household and individuals health (Goudge et al. 2009). Getting to the health facility, in the first place, requires a large of cost opportunities such as money that is much needed for food, housing and school-related costs. Other supplies and time to work in the farmer or others to produce income (District Profile 2005). Mobile health clinics present an opportunity to directly address these barriers by improving access to quality TB healthcare, while decreasing the cost and time associated with accessing health services (Matsinhe et al. 2006). Checktb supported by Dutch Government, projected to introduce in Malawi the one stop TB, by equipping trucks with small labs solar powered, with TB testing technologies. The aim of this project is to go through community for TB

diagnose. According to Checktb, this project will reduce delays in diagnose and drug resistance from up to 50 days to just 2 hours. Apart from this, it will reduce the costs of multiple trips to access the health units for screening and diagnose (Checktb 2011). In Maputo where people face challenges to reach the health facility due to distances and lack of transport, this intervention might be a prompt solutions to these problems.

### **3.4.2.Availability of Health Services**

The health workforce on TB services provision is one of the biggest challenges for the local health authorities. TB nurses are not available in the rural and remote areas of Maputo. The staff available has less training and some of them have no motivation to work on TB. They are arguing about poor working conditions, such as lack of ventilation in consultations rooms (rooms are smaller without windows), lack of medical material, no clear guidelines, and are so putting into risk their health and that of family members (Brouwer et al. 2014). For complicated cases, such as side effects of TB/HIV, MDR, XDR, interpretation of results, it requires a qualified staff and medical doctors, which are not available, or are not able to move to one stop TB/HIV for the same reasons argued by nurses (poor working conditions).

In Maputo, Psychologists and psychiatrists are available almost in all health facilities, but are not trained to deal with TB issues. For health facilities with MSF presence, they have a chance to be trained (MD Tommazi report 2016). The government used to provide a subsidy of risk for professionals who deal with high risk patients such as TB, but this is done in a discontinuous manner due to lack of funding and a poor management system.

The quality of services in one stop TB/HIV for DOTS provision has been described as deficient, leading to poor diagnoses, lost follow ups and patients not completing the treatment (DCS 2014). The opening hours for the public health units are from 7.30 to 15:30. According to the local health authorities and WHO recommendations, patients should come for treatment with an empty stomach to avoid interaction between treatment and food, for better efficacy of drugs. The patients arrive mostly at the health facility in the early morning (4 or 5am) depending on the flexibility of transport, even to make sure that they arrive on time. But the clinicians only arrive at one stop TB very late in certain cases they start DOTS at 11am. This situation makes the life of the patient worse and consequently they end up eating something or going back home without getting the treatment (MSF 2014).

### **3.4.3. Affordability of Health Services**

The national health system is for 90% the main provider of health services. The user fees are almost free of charge for the general population. For children under 7 years old, people above 60 years old and people declared poor with a poverty certificate, services are completely free of charge (MoH protocol). In Maputo TB has been seen as a public good, which any one can access without financial hardship, but the issues comes with the indirect costs and medical prescriptions that are not part of TB standard treatment (Anselmi et al. 2015).

In general, a higher amount is paid for a patient accessing the second level without passing through the first level. Beyond the direct “low user fees”, the indirect costs imposed by distance from health facility, time consumption due to long waiting time, food and school for children are the enabling factors that may influence patients not accessing the health services and health outcomes (Obrist et al. 2007).

#### **3.4.4. Acceptability & Accommodation of health services**

The health services, specially the one stop for TB have been improved due to support from national and international NGOs. But the situation is still far from accommodating for the needs of the local population. In the waiting rooms, children, adolescents and adults are mixed and are treated the same way, since the services are not friendly for each target group. The opening hours are not based on the needs, many have to drop out from schools and adults cannot fulfil their earned livelihood to follow the treatment.

Due to a lower level of education in the province, patients are not able to speak openly, either to understand the medical orientation clearly. Since many patients do not speak the national official language Portuguese, and some medical staff come from the north and centre of the country where they have their own dialects. Thus, Failing to communicate with the most spoken languages in Maputo (Changana and Ronga) (Chaveiro et al. 2009). In Mozambique, particularly in Maputo, there is a culture of not asking questions to the medical staff, since they are the ones who got knowledge. Its assumed that if they do not address the issue, it means everything is fine, even if things are not clear for the client (Langa et al. 2013).

Another aspect to consider, is age and sex of patients and providers, which is not culturally easy to accept, that a women can examine an elder man and vice versa. Many of patients do not feel comfortable having to deal with a provider with a different sex and age. In addition, children and adolescents are not included in the medical conversation, only parents. Having these implications in their adherence (Oliveira & Gomes 2004).

#### **3.5. Patients Awareness and Motivation**

Patient aware about the TB symptoms, but have to be motivated to seek and use the public health units to be screened and diagnosed by the government physicians (Mumba 2013). The challenge is how to overcome barriers faced, to reach the nearest health facility. Once there, the health professionals have to be aware about the symptoms presented by the patient to test for TB.

#### **3.6. Diagnosis, Capabilities and Capacities of Health Services**

The health system in Maputo is composed of public, private for profit and private non-profit (local and international NGOs). The public is the most dominant in the province although in the last decades the private for profit has grown significantly. The private for profit is more centralized in the urban area, while in the rural private informal such as drug shops and traditional healers is predominant. It is important to note that private informal (for profit) is the first



contact for 50% of the population before reaching the formal public health units (WHO 2010-2014).

### **3.7. Patient with possible TB Identified by Government Physicians**

The identification and screening of TB is done in the consultations rooms for patients presenting suggestive symptoms: cough producing sputum for more than 3 weeks with or without blood, stained sputum, tiredness, persistent low fever, loss of body weight, night sweating. In some cases, patients are identified in the waiting rooms by the Cough Officers, who make the quick link between patient and clinician (MSF 2016).

Patients are referred from other services such as normal screening consultations, maternal and child health, adolescents and youth, child consultations and HIV services. If a patient has possible TB the clinicians ask for sputum testing and if it is positive, the patient is referred to one stop TB. On the other hand a patient can be referred without being tested, but only based on clinical symptoms and later on, the test may be ordered by the one stop clinician.

Another screening point is at community level, where CHW screen coughing patients and refer sputum samples to the lab (Langa et al.2013).This task is not done continuously due to its difficulty to reach the dispersed population in the rural areas, poor supervision, lack of incentives. Many CHW, end up not performing accordingly either giving up to the task (DSC 2014).

### **3.8. Patient Correctly Diagnosed**

Globally there are several tools that are generally used for TB diagnosis, but in Maputo the main ones are: Direct Microscopy, Culture, Radiology Chest X-ray and currently the rapid test Genxpert.

The Direct Microscopy of sputum smears (Ziehl-Neelsen staining for acid fast bacilli (AFB), is the main one in use due to its simplicity to manage, quick results and low cost. This tool is highly specific, which detects very few false positives, but has a moderate sensitivity of approximately 60%. Repeated examinations are required in order to increase sensitivity (Misau 2012).

Culture of M. Tuberculosis is in use in the Maputo health system. A positive culture is considered a "gold standard for the diagnosis of Pulmonary Tuberculosis (PTB) and others forms of TB. This method is highly specific and has a high sensitivity. In Maputo it is used in specific cases because it is an expensive method and takes 4-6 weeks for results (Voskens 2013). It is not practical for the routine in the context of Maputo with a high prevalence of risk factors and TB cases. Therefore it is only available in the National Laboratory of Reference (NLR) in Maputo capital city.

Radiology (chest X-ray) is in use in Maputo but only in specific cases such as screening for health workers and a few health facilities have this tool available. This method can as well be used to confirm the previous suspected diagnosis based on clinical symptoms and at least three negative sputum. It has a low

sensitivity due to other diseases that can imitate tuberculosis on X-rays, therefore resulting in false negatives (Misau 2007).

Recently (2012), the local health authorities, in collaboration with private non-profit NGOs, introduced the rapid test Genexpert. The criteria to introduce the tool in Maputo was due to the high prevalence of HIV (19,8%) and the high prevalence of TB. The machine is used not only for a sensitive TB diagnosis but as well as TB resistant to Rifampicine and Isoniazid, two of the most important medicines on TB treatment (Cowan et al. 2015). It also detects easier TB on Co-infected patients which before with microscopy was difficult, due to the complexity to detect TB on HIV patients<sup>1</sup> (MSF 2013). The introduction of Genexpert represents an important revolution in the case detection, proper diagnose and treatment, task shifting from the doctors and clinicians to nurses. The Machine does not require a high skilled staff to perform and takes only two hours for results (MSF 2013).

In the context of Maputo, when patients onset symptoms and decide to seek help at health facility, are not promptly diagnosed. Patients use to move from one health centre to another to see the problem solved. Many reasons are raised: lack of technical capacity of staff to identify the suspected case, lack of medical material in the health facility, health workers workload, delays on returning results from the laboratory.

Some patients were quoted saying: *"even before I finished to describe what I feel, the doctor has written already the prescription, and often the same type of medicine, which I have at home"*. Thus, the delay before the patient is identified as a case, may take 60 to 62 days (Saifodine et al. 2013), while the patient continues being infectious to other people. Even if identified as a TB case, in many situations the diagnoses is not the prompt one, leading to the patient starting the wrong treatment and consequently eventually die or develop resistance. See in the annex 1, some patients testimonies on international TB day in Maputo, and TB advocacy conducted by Carlota Silva from MSF (24/03/2015).

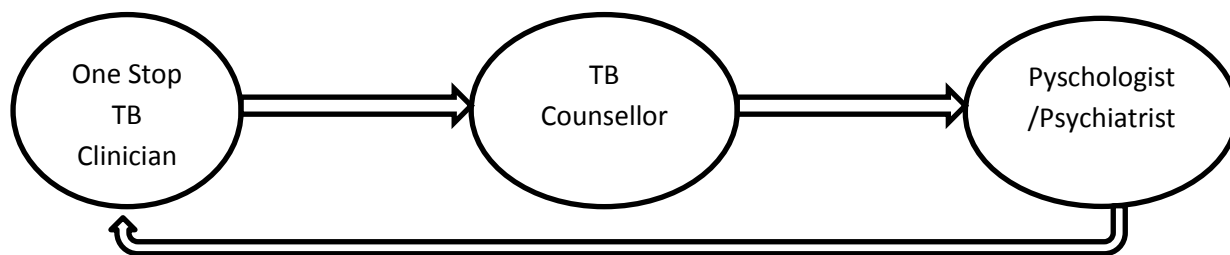
<sup>1</sup>Patients infected with HIV have different clinical presentation of TB, which in the early phase of HIV infection the signs are similar to TB.

### **3.9. Patient taking full treatment and is cured**

Treatment for drug susceptible TB takes 6 months, divided into two phases: intensive (2 months) and maintenance (4 months). For MDR-TB it takes 24 months with intensive it takes (8 months) and maintenance lasts (12 months), although the time may depend on the patient completing the treatment doses and conversion of cultures into negative ones (Misau 2012). From 2014 the local health authority in partnership with Doctors Without Borders, introduced the policy of a patient being seen by the Counsellor and referred to Psychologist either Psychiatrist before treatment initiation. The aim is for psychosocial support and preparation of patient, for better adherence on treatment. Due to duration and complexity of it (MSF/MoH 2014). See the

figure below, about the flow of patient after diagnosed and before TB treatment initiation.

Figure 5: Flow of TB patients after diagnosis before treatment initiation



Source: Adapted by the author based on the local MOH/MSF TB patient flow guidelines.

In the treatment provision, challenges faced by the national public health and the one stop TB are regarding to stock-outs and medical material (Matine 2015). The drug supply is not constant due to a poor information system, leading into poor stock management of drugs and procurement (Da Conceição 2011). In some cases the lack of transport of drugs from storages/supply to health facilities. This situation causes constrains and delays for patients to start the medical cascade of treatment. For patients already on treatment, they have to spend almost all morning traveling to access the medicine. They will have to spend all day at the health facility without eating according to recommendations and at the end without drugs (Tommazi & Diaz 2015). See patients testimonies in the annex 2 regarding stock outs advocacy, by Carlota Silva (MSF 2015).

When the patients are diagnosed, sometimes the duration of treatment is not explained properly, side effects and why it is important to adhere the treatment. This is because of the workload of the clinician, not having enough time for health talks with patients. For Co-infected TB/HIV patients the situation is even worse, because they have to take many different drugs daily such as Cotrimoxazol, ARV and TB drugs, not being able to distinguish among drugs what works for what. In the health facilities, where TB counsellors are available, the situation is better and has good outcomes in terms of patient follow up and referral system for psychologist or psychiatrist for further mental support (MSF 2014).

Since 1993, Mozambique successfully adopted the DOT strategy soon after the WHO declared TB as an international public health concern and urged the countries, with high burden of TB, to adopt it. Since then, Mozambique has become a reference at regional and international level. Maputo figured as the second best province with 93.8% of DOTS coverage behind Inhambane province with 100% of Coverage (PNCT 2007).

With the emergence of HIV it has put down the efforts and gains made on the TB control strategy due to the high prevalence of Co-infections TB/HIV, since TB is the main opportunistic infection amongst HIV patients. The figures at

country level shows from 2007 to 2011 that co-infection has increased from 47% to 63% respectively (MOH 2013), though introduction of early ART and isoniazid preventive therapy on HIV patients is key for TB prevention and care (Harries et al. 2012).

The local Government introduced the DOTS with the aim of Universal Health Coverage and equity for all population with the main focus on prioritizing the most vulnerable groups such as children, pregnant, elderly, HIV patients and the poor. The current situation of high prevalence of co-Infection, poor health systems, poor availability of health workforce, increase of drug resistance cases, poses an enormous challenge to the health authorities. To overcome the situation towards UHC and quality of services, which only 50% of population is accessing health services for TB (PNCT 2007).

In 2015 MSF in collaboration with MoH, launched in Maputo city, the home based DOTS for patients who are not able to walk to a health facility, patients with adherence issues and drug addiction are also included in the home based visits for DOTs. According to the MSF report 2016, the outcomes of this strategy are promising, although it needs more involvement of the MoH by providing more human resources to increase the coverage at provincial level.

### **3.10. Political Framework for TB/HIV**

In order to fight TB in the country, the government created the national strategic plan 2008-2012, based on the global plan stop TB. The plan focuses on six main pillars:

- Expansion of DOTS in the country
- TB/HIV prevention and care
- Involvement and engagement of health professionals
- Operational research on TB/HIV
- Strengthening of health systems
- Involvement of TB patients and community.

To make the plan feasible and concrete the government has invested 49,5 Million US dollars. The health expenditure is divided in each particular strategy on the bases of its importance (PNCT 2007).

In the context that co-infection has an important effect on both programs TB and HIV, because increase mortality rate, cases of TB with negative bacilloscopy, extra-pulmonary TB and decrease efficacy on TB patients, the government decided to combine the two programs in one (Misau 2013). This decision followed the recommendations by the WHO policy. Having the two programs structured in collaboration it may increase efficiency and efficacy of both control programs. A study conducted by Owiti et al.(2015) in Rural Kenya, has shown promising improvements amongst TB/HIV patients in the uptake and reduction of delays in provision of Tb treatment, prophylaxis with cotrimoxazole (CPT) and ART.

In 2015, the government of Maputo, has been engaged in following the country health plan strategy (PES), by training and updating all health staff

involved on TB/HIV control program such as district directors, new supervisors. Trained 6 medical doctors, 2 technicians, 3 medical agents and 18 Nurses. In addition, traditional healers and church leaders were trained and involved in screening and referral of suspected patients to the nearest health units (DSC 2015). Beside the challenges mentioned already, the emergence of new strains of TB such as DR-TB and XDR-TB, are to be considered as an emergency situation to the local government.

The MoH, in collaboration with the City Council of Maputo (CMM), has begun to implement a number of strategies, to increase awareness and utilization of health services, in the local population, through innovative community-based approaches. The initiatives take place at community level, using Community Based Health Workers (CBHW), either with direct government support or through local and international NGOs (PNCT 2012).

The CBHW are tasked on to provide much of the preventive care in rural and remote communities: community talks on key diseases such as TB/HIV and malaria, pneumonia and diarrhoea. Counselling on family-planning methods, promoting deliveries within health facilities, linking to nutrition programs and improved health-seeking behaviour (Global Fund 2014). The intervention at community base, is crucial to increase awareness in the population, since they have the ability to reach remote areas where public health services are not available. In addition, they have the capacity to mobilise communities through behaviour change on sociocultural norms, which enables people to use health facilities when they need. The CBHW are now the cornerstone for the new TB community DOTS strategy (MISAU 2012).

The main drawback of this strategy is the way the health education and talks are conducted: It focuses on numerous groups of people, and is not a patient centered approach (Zachariah et al. 2012), and many people have different capacities to understand the given messages. In some cases people do not feel comfortable to talk in front of many, mainly if the topic is sensitive so this is a constrain.

The sustainability of this strategy is undermined by the local Government relying on private organizations to implement the activities. Many of the CHW are not well trained, either updated continuously, which in many times, they confuse the community with mixed messages. Lack of supervision and incentives from the local MoH and health authorities is another major challenge to implement the community based activities with the desired quality (DSC 2014).

## **Chapter 4: Good Practices in earlier detection and treatment provision in other countries.**

This chapter will focus on the countries, where strong achievements were made, towards elimination of TB based on global partnership TB. India, Afghanistan and Portugal. With the main focus on health services utilization, earlier detection, and success in treatment.

### **4.1. Case Study from Avahan Indian AIDS Initiative**

Tuberculosis in the context of India is still a huge public health concern for the local authorities. Annually it records 2,3 million of new cases of TB which is 6.4% in people living with HIV and AIDS. India has the second case load globally behind South Africa (Tucker et al. 2012).

In India, the high prevalence of HIV is concentrated in specific groups such as man having sex with man (MSM) 7.3%, Female sex workers 4.9% and injecting drug users 7% (UNAIDS 2014). These groups are at a high risk of co-infection. Due to stigma, discrimination and user fees for services, this may influence the way they seek help, when the onset of symptoms, increasing their morbidity, mortality and infectiousness in the community.

Based on the WHO evidence, that early detection and treatment provision for TB patients Co-infected, it is crucial to reduce the rate of transmission. Avahan and STIs capacity building partners agreed with the local Revised National Tuberculosis Control Programme (RNTCP) to intensify the case finding through peer educators. In Andhra Pradesh with 84.655.533 population (Census 2011), is the Indian state most affected by HIV and co-infection prevalence (21%), (Seth report 2011). Peer educators and health providers were trained on TB/HIV with clear referral guidelines, protocols and screening tools containing specific questions to address the target population.

The aim of the study, was to an evidence based demonstration of TB screening, amongst the key population with HIV. Further, to present lessons learnt from implementation of a verbal TB screening programme, conducted by peer educators involved in HIV and STI prevention outreach. Additionally, the study aimed to contribute on integration of TB services in HIV prevention services, for the target population at high risk of co-infection (Tucker et al. 2012).

The project achieved huge interesting outcomes such as increased coverage of services, capacity for local organizations to deliver TB services and increased access to treatment for TB.

During the period of implementation an annual average of the 53.749 target population received at least one type of service (TB, HIV, STIs). On average 88% of users were screened verbally for TB every year. In addition, peer educators performed a total of 32.086 referrals to STI clinics after verbal TB screening. From the referred suspected cases who were examined in special labs, at which 7.2% tested smear positive, that means were true TB cases. During the three years of the project, the proportion of key population, who

accessed TB treatment subsequent to a TB diagnose, increased from 88% to 93,7% (Tacker et al.2011).

Using peer educators for verbal screening is one of the most effective interventions to improve early detection. In Mozambique especially in Maputo, peer educators are now in a scale up intervention for the local government, but only for health talks at community and health facility level. Using the experiences of India in screening and detection it may serve as a trigger to increase detection and improve TB outcomes in Maputo.

#### **4.2. Food Assistance to Tuberculosis Patients: Lessons learnt from Afghanistan**

Afghanistan is one of the most affected Asian countries with high prevalence of Malnutrition and Micronutrients deficiencies. At the same time, facing a high burden of TB which is part of the 22 countries with high Burden of TB, with an estimate of 53000 cases per 100.000 populations per year (WHO 2016).

Food insecurity and poor nutrition in the population has been described as the main risk factor for the high burden of TB, contributing to progression from infection to active TB, lower BMI (<18,5 kg/m<sup>2</sup>) even with treatment, contributing to the death of TB patients (WHO 2015). The poor people with food insecurity, face a lot challenges to complete the TB therapy, as it takes 8 months in Afghanistan.

Food security was introduced for the first time 1997. In 2002 it scaled up when DOT strategy was introduced in the country. The local government in partnership with NGOs, namely the World Food Programme (WFP) Italy, provided monthly food support for patients in 1197 health facilities offering DOTS distributed in all 34 provinces. The support was available for all patients notified and enrolled in DOTS no matter what the socioeconomic and nutrition status was of the patient. Basically, the food support covered a parcel for a household of six members (Pedrazzoli et al. 2016).

Based on the WHO End TB strategy (2015) statement that links between poverty/food insecurity, TB incidence and treatment outcomes, the local government and partners have decided to introduce the food assistance. The main aim was to increase adherence of TB patients on DOT, increase cure rates of TB, increase the case detection by supporting households affected by TB. Finally, to mitigate increased vulnerability to food insecurity on TB patients and households (Pedrazzoli et al. 2016).

According to the study, outcomes with 4 Focus Group Discussions (FGD), found that patients were suffering from indirect costs of transportation (US\$ 2 and US\$ 4) per person to reach the clinics for treatment, without adding the costs of food.

Calculating the food rations, the costs doubled, being a high financial burden amongst TB patients and households. Given the fact that evidence on the impact of food support in many settings is still unclear, in Afghanistan it was found that food support in a vulnerable population, contributed increase of

case detection. Patients accessing more the health services, following successfully the treatment, and protection of people from catastrophic costs related to TB treatment (Pedrazzoli et al. 2016).

In Maputo, many TB patients are faced with food insecurity. Due to socioeconomic and natural issues such as droughts and floods. Using the experience of Afghanistan it might be an incentive to patients and households to adhere to TB screening schemes and treatment follow ups successfully.

In Maputo there was already food support, provided by the INAS (Instituto Nacional de Assistencia Social), but the institution from 2013, is no longer supporting all patients, but only a few special cases, due to cuts from WFP. For the few patients they serve, the process is bureaucratic and takes a long time (Tommasi 2016).

### **4.3. Portugal visit by WHO/ECDC for TB program evaluation**

Portugal is one of the Western European countries that still face high incidences of TB. In 2011, recorded 2.388 new cases and relapses, which were 2016 nationals and 372 foreigners, representing 16% of cases (ONDR 2009). Nevertheless, it has been making advances in control of TB, which is part of the seven countries in European Union that exceeded the rates: Detection rate 87% and cure rate 87%. These achievements are thanks to specific strategies such as:

- Tracing for lost follow ups and defaulters, where patients abandon treatment due to side effects and other reasons, representing a threat to the community and family members;
- Tracing and screening for family members and co-workers who have had contact. In this intervention the vulnerable groups like children are prioritized;
- Isolation of the patient in the intensive phase of treatment when the patient is still infectious to others. One of the measures is to not allow the patient to work either to perform duties that involve contact with other people, mainly in environments without proper ventilation;
- Political and financial commitment, where the local government focused on financial protection for people on MDR and XDR treatment, that would otherwise be difficult, mainly for poor to cover the costs, given the complexity and the high costs of it.

In 2009, the WHO and the European Centre for Disease Prevention and Control (ECDC), visited the country in order to evaluate the local TB program. Based on the achievements described below, the WHO/ECDC committee found the results promising regarding the TB elimination in Portugal.

- Achieved and sustained success cure rate-outstanding DOT
- Strong links between civilian and prison sector
- Strong drug procurement system
- Strong surveillance system



- High percentage of bacteriologic confirmation and DST
- Good example of multi-disciplinary team approach in TB/HIV case management (WHO/ECDC 2009).

Even with the great advances made, in controlling the disease, there are many challenges still, for the total elimination of the disease in Portugal. The challenges are alignment and better follow up of treatment guidelines, who are neglected by some health workers and quality improvements in the health system for better responsiveness. Portugal has the highest TB/HIV co-infection in EU, this is posing a challenge to the local health authorities.

The reason to focus on Portugal is because it has the best interventions on TB, consequently have high rates in detection and cure which are the main challenges in Maputo. Almost all the strategies implemented by Portugal, are in place in Maputo health and TB policies, although the bottom line is the effective implementation of these policies. Due to similarities in language, good diplomatic relations with Mozambique it would be easy to collaborate and adopt the local TB policies and practices.

## **Chapter 5: Discussion**

In the context of Maputo, many factors might contribute to patients not using health services, which enables them to be earlier detected and treated adequately. In this paper, findings suggest that socioeconomic and health systems are the main leading factors influencing the peoples decision to seek help when they are ill or either experience the onset symptoms of tuberculosis. Sociocultural factors, particular the power relations between male and female (gender), are other important contributors in how people seek public health services and overlap in terms of influence in reaction to the disease.

Regarding socioeconomic influence, poverty, living conditions, lack of resources such as transport including costs of it, illiteracy, enable people to access health services and reduce their willingness to participate actively on healthy habits and decisions. The gaps between poor and rich people, inequalities between rural and urban areas of Maputo are dimensions to be considered on how people make choices. At this point, for poor people the health issues are not their priority, but their focus is on how to survive each day, how to provide food and school for their children. In case of floods, which are common in the rain season, the concern is where to find safe places and how to improve their shelter. Health might be not the immediate priority in this case.

Sociocultural is a detrimental factor as well as socioeconomic. If people do not know about symptoms of the disease, especially TB, or either understand the severity of it, based on what they perceive (local cultural beliefs about acquisition of TB), it may definitely influence on their action and medical choices, attempting to solve the situation by their own means. Culturally, it is easier to access the nearest traditional healer, either drug seller who can speak their local language, and private clinic that are normally more responsive and have a perceived quality. Even if this leads to financial catastrophe for the individual and household. The decision to seek these health providers, as described above, is also related to the fact that they are the nearest resources close to the population, so they will not face other indirect costs such as transport and time to access the health unit, if available in that area.

Another important predisposing factor is gender, the power relation between man and female in Maputo is still visible. When women are ill, they have to rely heavily on the husband in how, when, and where to seek help if needed for her and their children. Concerning TB symptoms, gender plays a key role. Since in women, symptoms are not clearly seen as with a men, it becomes difficult for women to recognize it earlier, and this can be influenced by the level of education and knowledge in some cases. Many studies have argued that education is a key dimension on how people behave when ill, in Maputo, women illiteracy is still a big challenge.

Lastly, the caseload of TB between man and women is quite different. In women the progression of latent to active TB and case fatality rates are higher, mainly in the reproductive age group. On the other hand, women feel more embarrassed having to deal with TB than man, therefore, this leads to preferring to seek local traditional healers and religious leaders to avoid embarrassment and self-stigma at health units.

People accessing and using public health services is the key, although the performance of the health system such as the TB program is critical for earlier detection and treatment provision to reduce the impact of TB in Maputo. Alongside socioeconomic, sociocultural and gender issues the health system is the most important contributing factor to fight and eradicate the disease in Maputo.

The lack of motivation and working conditions from providers enables them to perform throughout the detection and treatment provision, this being an important factor to miss patients suffering with TB. The local workforce is not motivated to work through one stop TB due to lack of resources, such as material, drugs, clear guidelines, poor supervision and support from managers. The consultation cabinets do not offer security measures because they are small and not ventilated, thereby endangering the health professional and patients themselves. Since rooms are not ventilated, patients are seen and evaluated with the door open, so patients have no confidentiality.

For proper detection and adequate treatment, it requires skilled health professionals, since tuberculosis is mainly related to HIV it is complex to diagnose. Another challenge is regarding the diagnoses of children, in some cases it is difficult to produce sputum, and symptoms are not clearly visible as well. The shortage of medical staff, mainly in the rural areas, is the main challenge of the local health authorities to fight TB/HIV, for people who managed to reach the nearest health unit should be followed accordingly

When patients are diagnosed in some cases there is no drug to start the medical cascade and follow up treatment, due to a poor management system, poor drug supply from the health system. In this case, it decreases the chance to retain the patients into health care. In 2014, Maputo registered 11% of lost follow ups on TB services, and this is higher than recommended by the WHO, it has to be lower than 4%. These missed appointments might be related to stock outs in the health facilities.

To build up the findings, an adapted conceptual framework, combining aspects from Rundi and Piot was used. The Rundi is a health believe model that basically focuses on the client perspective, on how people perceive their illness and based on their context and situation how it lead into action either choices.

While on the other hand, The Piot model focuses on the patient recognising TB symptoms and accessing the services. Piot shows what would be the natural course of TB patient in effective detection and treatment. At the same time, it shows where the GAPS are when many patients are lost. Since the study analyses both sides, users and providers, the two models complement each other and helped to adapt the one used to explore and understand the main challenges faced in both sides. The framework used, has some limitations, in terms of political factors, which are detrimental for TB program and health services in general, for better response in the interventions. All challenges mentioned in this study rely on to at what extent the political side is involved.

## **Chapter 6: Conclusions and Recommendations**

### **6.1. Conclusions**

Delays in utilization of health services, from the users to be detected and treated, are caused by both, providers and users.

The health systems are the major contributors of delays on services utilization, detection and treatment provision. The TB programs are not capable to identify a case on time, due to poor health systems, lack of motivation and technical skills of staff. Even patients who manage to access the public health units are not diagnosed and treated promptly. This delay may take more than 60 days during in with patient is being infectious. The poor responsiveness from the public health system results in people mistrusting and not willing to use the public health services.

The first place the patients go when sick are private-informal or private formal-for-profit due to the perceived quality and responsiveness that they offer to their clients. Public health services are the last stage where the patient thinks about accessing due to many reasons already mentioned above.

From the user side, delays are caused by a combination of factors such as socioeconomic, sociocultural and gender. There are many aspects that the patient will have to face and overcome in order to access the health facility when ill or encountering the onset symptoms of TB. The lack of resources such as poverty, lack of transport, education, are the main determinants for a patient to decide when and how to seek help. From development of disease until reaching the health facility to be diagnosed takes a long time. The situation is even worse in the rural areas, where imbalances and inequitable distribution of health workforce and resources between urban and rural are evident.

Another aspect to consider as cause of delay from the patient side are cultural beliefs and the perception of TB and its symptoms. To make the proper decision, one has to understand clearly what is going on. If symptoms are related to local beliefs and interpretations, such as men having sex with a "non-purified" widow, men having sex with a women in the menstrual cycle, and to have breathed dust from the mines, it becomes challenging to think, how to seek help in the health unit. The medical choices will be influenced by these beliefs.

The gender dimension is an important point to consider, particularly for women, who have to rely on the man's decision. In this case, it will depend on how the husband/man perceives the severity of the situation to make an earlier decision. The TB symptoms are not very clear in women, so it may take a long time to understand the situation towards the decision to seek the health unit. Tuberculosis brings embarrassment and stigma for women, therefore it becomes problematic to seek and use health on public units. Women suffer further consequences of TB when extrapulmonar (genital) may lead to infertility, or during pregnancy it may result in poor pregnancy resulting in shame and loss of marriage.

## 6.2. Recommendations

The recommendations in this paper are organized by priorities, regarding its feasibility, costs and time. It would be unpractical to address everything at the same time. For instance, behaviour change and cultural beliefs takes time and is a long process, so it has to be done step by step. Recommended priorities are first given to health promotion and screening through community based approaches, medical supply (Health systems and services delivery), policy makers, Social Support. Lastly, Political and financial commitment, although this must be within the all processes of TB prevention and care.

- Community based approaches are proven to be effective; because they may reach everywhere and everyone and can tackle issues in the remote areas which otherwise would be almost impossible. The activities involving community health workers, have to be done in a continuous manner, patient focused, with a good collaboration amongst all stakeholders and with good supervision and proper management from the local health authorities.

Beside the lack of incentives, one of the biggest challenges faced by the CHW for better performance is distance. In rural areas for instance, houses are located very far apart, making it difficult to reach and support the patients in case of need. Collaboration with the local and international NGOs is detrimental for incentives and support in transport to facilitate the mobility of CHW.

Based on the example of India, using peer educators for screening for TB in the community is better and practical in the case of Maputo because the community trusts people they already know or either have experienced the disease, and the peer educator is scaling up in the province. This would be a good opportunity to train the peer educators to perform this TB task.

- Policy makers, have to focus on clustering the determinants of TB, not only designing intervention to diagnose and treat who are already ill. It is important for policy makers to make sure that interventions target aspects related to poverty, nutrition, working conditions and other factors that weakens the immune system, making people vulnerable. Another important thing to consider is the aetiology of TB, which is important to understand and to address the proper intervention. It is the matter of policy makers to provide clear guidelines that health professionals can easily understand and interpret, making it available and accessible for each professional who deal with TB screening, testing

and treatment. This activity has to be well followed by the local MoH and Health authorities.

- Health systems and services delivery: The poor health system in Maputo is one of the most important contributing factors for people not using the public health services. Due to lack of trust of staff and quality of services that are delivered. Health facilities have to be well equipped with all material and medical products, needed for TB/HIV testing, drug supply, staff that are committed and the responsiveness for people who are accessing the services. To do so the local MoH, has to involve the health professionals in the decisions making and empower them in order to build ownership and the vision to eradicate TB from the province. Additionally the MoH has to make sure that there is a good interaction between health professionals, community and all stakeholders involved in the health units. One of the common barriers is the communication, in terms of language, which many people do not speak and understand the messages that are delivered, and the believe from the community that clinicians and medical staff are the one who decide, so the communication is only one way. Given the fact that the private informal are the first contact of more than half of the population, when they are facing illness, collaboration with these institutions is key. Following the policy that the MoH is already engaging traditional healers and church leaders, by training them to deal with TB.
- Political and financial commitment: The health plan of Maputo is based on the country plan level, which focuses on 5 years during the mandate of new elected or re-elected government members. Since TB is a complex disease to deal with and enables people to earn their livelihood while they are ill, political commitment for financial protection is key for a successful TB program. Portugal for instance, reached the desired objective of high rates of detection and cure, thanks to the local political commitment. Increasing and improving domestic mechanisms for collection revenue for health especially on TB/HIV, is crucial to control TB, and financial protection for poor and infected and affected by both TB and HIV. It is the matter of government to ensure involvement, education, behaviour change and cultural habits of communities to increase awareness on TB and rebuild the trust of the local health systems in order to access and use the public health services. Following the example of Portugal, multi-disciplinary approach has proven to be crucial to reach better outcomes of the TB/HIV program, since HIV is one of the main risk factors for TB in Maputo, having a good collaboration between two programs is worthy.

- Social/Food Support: Psychosocial and food support for patients facing TB and their members of family, has proven to be a motivation factor for people to be screened and tested for TB, and completing the treatment in Afghanistan. In Maputo, the INAS should provide food support for patients notified, and attending health facilities for DOTS, without restrictions or bureaucratic process. It is the matter of the institution lobbying with local and international organizations such as WFP and other privates, to guarantee continuous distribution of support for all patients.



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## 8. Appendices

### **Annex 1: Testimonies of patients with delayed diagnose, and starting the treatment not related to the proper TB.**

It took a long time to discover that i had tuberculosis drug resistant . In 2012, I was low inpatient in a hospital in Boane , they told me that I had tuberculosis ( sensitive) and I was transferred to Machava . I followed the treatment of 4 tablets per day for 6 months , but then I had another relapse. In November 2015 they diagnosed me with tuberculosis resistant . The medication of this disease is very heavy. It takes great courage . In my area I have a lot of support from friends, so that's why I continue with treatment.

Patient with Tuberculosis Multidrug-Resistant ( MDR-TB )

*The diagnosis of my disease ( MDR- TB) was very difficult , it took over a year to be discovered that it was resistant TB . Despite all the problems , I cannot give up. I feel very motivated because I love life. I think with the experience I am having, I can make a difference in my neighbourhood, to make people understand Tuberculosis is curable . Everything depends on the will and with the blessing of God.*

Patient with Tuberculosis Multidrug-Resistant ( MDR-TB )

### **Annex 2: Patients and staff suffering from availability of drugs (stockouts) in the public health facilities.**

I am a nurse , civil servant and contracted the disease in the exercise of my functions . I started treatment on 8 January 2013. In the 3rd quarter of my treatment , the culture was negative and I began to feel better . But began to be a lack of medicines and my clinical status has gone aggravating to the point of being inpatient in the Hospital of Machava for 8 months. Even though there was no improvements due to lack of drug scheme mounted on my treatment . The doctor who attended me gave me to the healthcare of Doctors Without Borders . I restarted the treatment with all medicines complete but the disease had already created resistance to all drugs . Should be created conditions for new drugs approved and in use in other countries for the treatment of this disease.

Patient / nurse with tuberculosis extreme resistance ( XDR-TB )



**Annex 3: Patients expressing their emotions through drawing to complain and report lack of TB drugs**



Source: Doctors Without Borders TB Advocacy in Maputo 2016.