DIAGNOSTIC DELAY IN PULMONARY TUBERCULOSIS - A CROSS SECTIONAL STUDY

Dissertation submitted to
The Tamil Nadu Dr.M.G.R. Medical University
in partial fulfilment of the regulations
for the award of the degree of

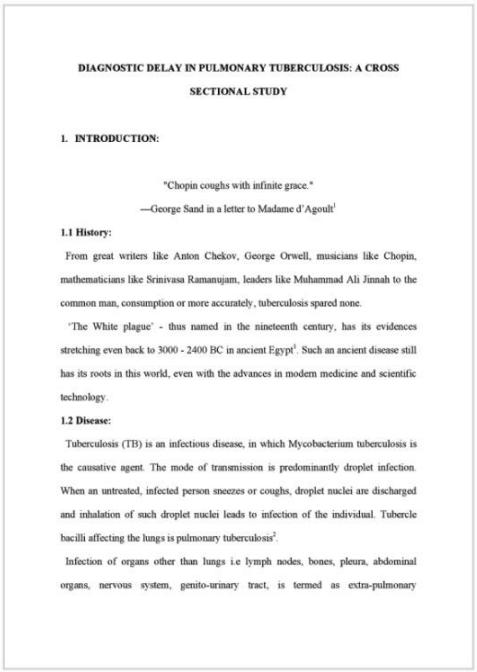
M.D. (Community Medicine) - Branch XV

GOVERNMENT KILPAUK MEDICAL COLLEGE

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

CHENNAI, TAMILNADU

APRIL 2017



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1.2 Disease:

Tuberculosis (TB) is an infectious disease, in which Mycobacterium tuberculosis is the causative agent. The mode of transmission is predominantly droplet infection. When an untreated, infected person sneezes or coughs, droplet nuclei are discharged and inhalation of such droplet nuclei leads to infection of the individual. Tubercle bacilli affecting the lungs is pulmonary tuberculosis[2].

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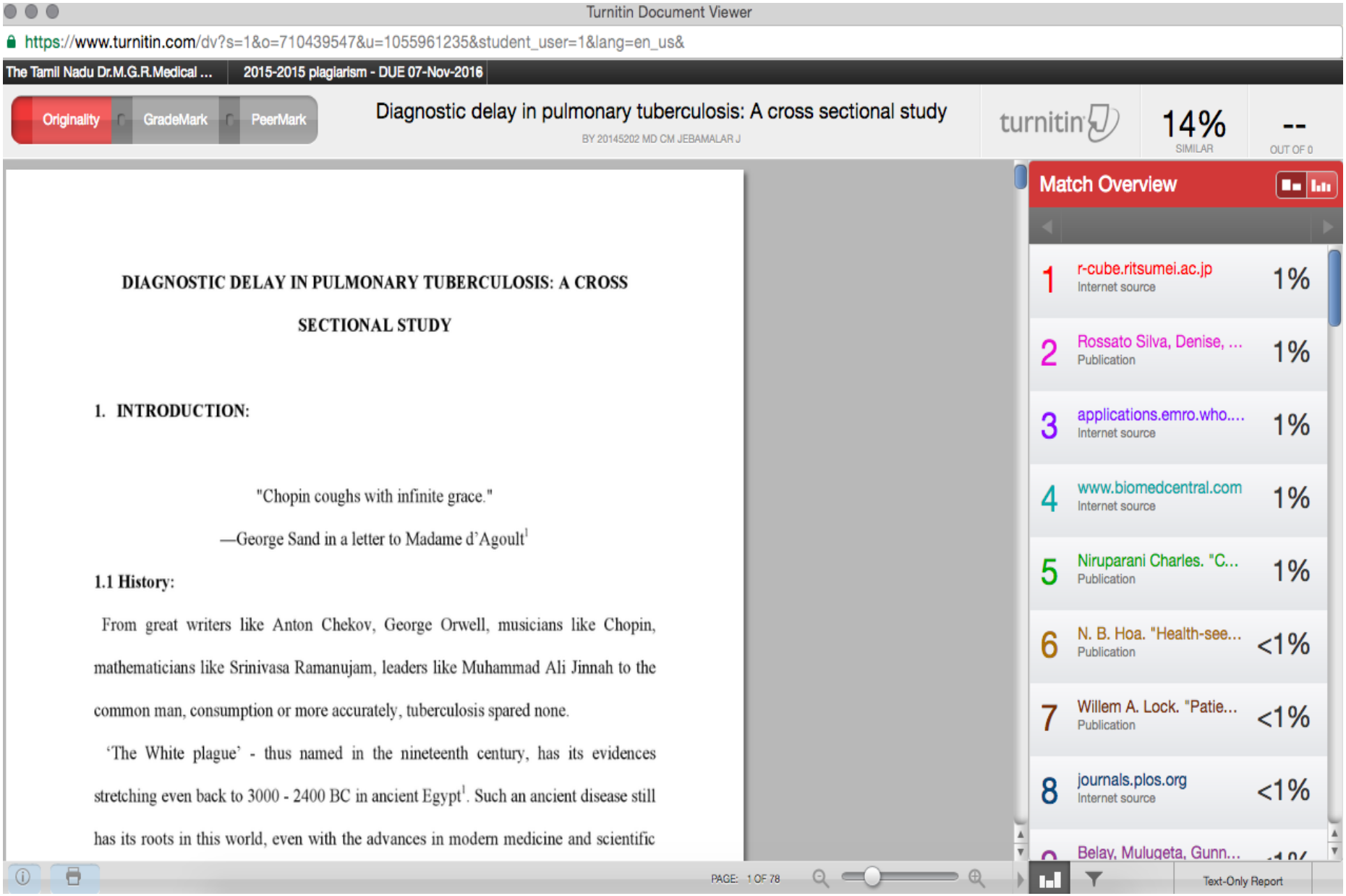
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BONAFIDE CERTIFICATE

This is to certify that the dissertation titled '**DIAGNOSTIC DELAY IN PULMONARY TUBERCULOSIS - A CROSS SECTIONAL STUDY'** is the bonafide work of Dr. Jebamalar J, post graduate student, Department of Community Medicine, Govt. Kilpauk Medical College, Chennai for partial fulfillment of the requirement for award of M.D. Degree (Branch XV) in Community Medicine by the Tamil Nadu Dr. M.G.R. Medical University is a bonafide work done by him at GOVT. KILPAUK MEDICAL COLLEGE, CHENNAI during the academic year 2014-2017.

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DECLARATION

I, Dr. JEBAMALAR J solemnly declare that the dissertation titled '**DIAGNOSTIC DELAY IN PULMONARY TUBERCULOSIS- A CROSS SECTIONAL STUDY**' is a bonafide work done by me from July 2015 to July 2016 under the expert guidance and supervision of my guide Dr. Priya Senthil Kumar, Associate Professor, Dept. of Community Medicine, Govt. Kilpauk Medical College, Chennai-600010. This dissertation is submitted to Tamil Nadu Dr. M.G.R Medical University, towards partial fulfilment of requirement for the award of **M.D. Degree (Branch – XV) in Community Medicine, April 2017**.

The study was conducted in Zone VIII of Chennai Corporation. I have not submitted this dissertation previously to any university for the award of any degree or diploma.

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DECLARATION

I, Dr. Priya Senthil Kumar, D.G.O., M.D, Associate Professor, Department of Community Medicine, Govt. Kilpauk Medical College and Hospital declare that this dissertation titled '**DIAGNOSTIC DELAY IN PULMONARY TUBERCULOSIS – A CROSS SECTIONAL STUDY'**, has been prepared under my expert guidance and supervision by Dr. JEBAMALAR J, for her partial fulfilment of the regulations for the award of the degree M.D Community Medicine by the Tamil Nadu Dr. M.G.R Medical University and the examination to be held in April 2017.

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leads to infection of the individual. Tubercle bacilli affecting the lungs is pulmonary tuberculosis[2].

Infection of organs other than lungs i.e lymph nodes, bones, pleura, abdominal organs, nervous system, genito-urinary tract, is termed as extra-pulmonary tuberculosis. Infection of an individual does not necessarily lead to the disease. Progression from infection to disease is determined by a number of additional factors including HIV co-infection, diabetes mellitus, substance abuse, and malnutrition. When a person progresses from infection to disease, they may not experience obvious symptoms for a long time, (e.g cough, fever, hemoptysis, weight loss etc). This might lead to delays in diagnosis and treatment seeking. Without proper treatment, around 45% of the HIV negative individuals with TB and almost all of the HIV/TB co-infected will die[3].

1.3 Control of TB:

For the control of tuberculosis, early case finding, diagnosis and management are the three key components. They are discussed subsequently.

Case finding, diagnosing and treating the cases early has the benefits of curing the patient as well as curbing the disease transmission in the community at large. Among the several components in the tuberculosis control strategy, case detection still remains the key to effective control.

1.3.1 Screening & diagnosis:

The WHO manual on systematic screening for active tuberculosis, provides the following recommendations.

- Systematic screening for TB in high risk groups such as HIV infected individuals, contacts of TB cases and workers who are exposed to silica.
- Screening to be considered in prisoners, those who seek health care in high prevalence areas, populations with poor access to health care e.g Urban slums, marginalized groups, homeless, refugees and migrants[4].

1.3.2 Approaches to screening:

The recommended screening approaches for high risk groups are screening using symptoms and chest radiography.

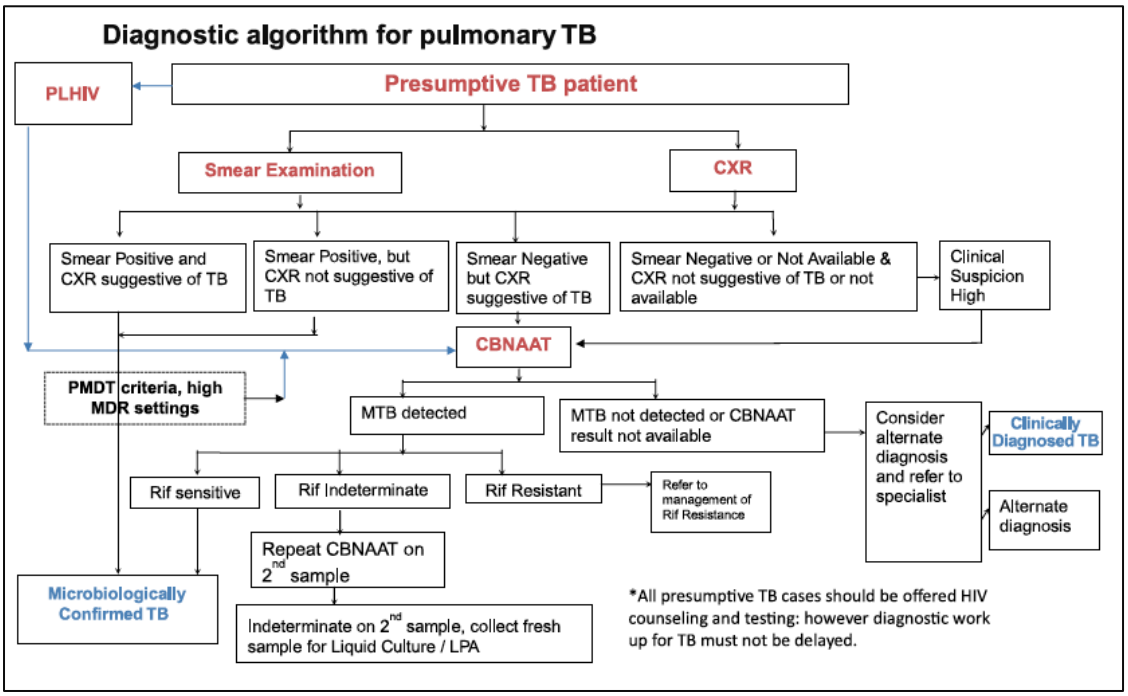
a. Symptom screening:

- Cough >2 weeks
- Haemoptysis
- Weight loss
- Fever
- Night sweats

b. Screening with Chest radiography

1.3.3 Diagnostic testing:

The diagnostic algorithm for Tuberculosis is as follows[5]



The current diagnostic tests which are recommended for usage are:

- Sputum LED microscopy: (Using Auramine O'stain)
- Liquid culture and drug sensitivity testing system.
- Rapid molecular tests e.g Xpert MTBB/RIF test
- Standardized tuberculin skin testing can be used in the pediatric age group in addition to other tests.
- Usage of serological testing has been banned by the Government of India since 2012[5].

1.4 Management:

Tuberculosis is curable, provided diagnosis and treatment are made early. Drug susceptible, active disease is treated with a treatment regimen lasting for 6 months with four anti tuberculous drugs. The patients are provided with information, support and supervised treatment by the health workers or trained volunteers. This is the basis for DOTS (Directly Observed Treatment Short course). Such support is essential to maintain treatment adherence and also aids in reducing the spread of infection to others. From 2000 to 2014, it is estimated that 43 million lives have been saved through timely diagnosis and treatment of tuberculosis[6].

One of the components of timely diagnosis and treatment of tuberculosis is estimating the delay in diagnosis of TB and assessing the factors contributing to the delay. This study seeks to address the above issue.

2. JUSTIFICATION

2.1 History of TB control:

2.1.1 World level:

History of Tuberculosis in modern medicine had its origins with the work of Theophile Laennec during the early 19th century. Robert Koch identified the microbe in 1882. Von Pirquet developed the Tuberculin skin test, and used it for the demonstration of latent tuberculosis infection in asymptomatic paediatric population. Sanatorium treatment for tuberculosis was started first before the introduction of chemotherapy. In addition, procedures were developed to address the collapsed cavities, and to rest the infected area of lungs[1].

BCG vaccine was introduced during post World War I. India introduced BCG mass immunization in 1948. Currently it is a part of the universal immunization program[7].

In 1991, WHO established the 70% case diagnosis and the 85% cure rates to be achieved by 2000. TB was declared to be a global emergency by 1993. DOTS was launched as the WHO strategy in 1995. Stop TB partnership was launched in 1998 and it aimed for a dramatic reduction of the global TB burden by 2015 in line with Millennium Development goals[8].

Then the six-pillared WHO Stop Tuberculosis Strategy was introduced in 2006. The additional component of ‘Empowering people with

TB and their communities' was included. This component affirmed the ongoing need for promotion of communication, advocacy and social mobilization to influence policy changes and sustenance of commitment. 'Patients' charter for Tuberculosis care'- a set of good practice rules to apply to health care delivery was promoted. This was done in order to facilitate community participation in the care of TB patients[9].

In the year 2014, the World Health Assembly was attended by the Ministry of Health in 194 countries. The post-2015 'End TB strategy' was adopted and the member countries took a pledge to implement it. Ending the TB epidemic is the 'Sustainable Development goal' target for 2050. End TB strategy has been targeted to end the global epidemic of TB, by reducing the deaths due to TB by 95% compared to 2015, reduction in the number of new cases by 90% between 2015 to 2035, and to make sure that no family is burdened by catastrophic expenditure due to TB. The slogan adopted was 'Unite to end TB'. The vision is to have a world free of TB and zero disease, death and suffering due to the disease[10].

2.1.2 TB control in India

Tuberculosis control in India had its origin with the National Tuberculosis Program in 1962. However, owing to the unacceptably low cure rates and high default rates, the Revised National Tuberculosis Control Program was launched in 1993. DOTS strategy was adopted to improve the treatment completion rates[2]. In 2006, India adopted the WHO STOP TB

strategy. It included additional components such as empowering patients and their communities, addressing MDR-TB and HIV/TB. NACP & RNTCP developed the National Framework of joint TB/HIV collaborative activities. Later, National Strategic Plan was included in the 12th Five year plan, with a vision of TB free India. The goal of this National Strategic Plan is to have universal access to high quality TB diagnosis and care to all individuals of the community. Its objectives are

- 90% notification rate for all TB cases
- 90% success rate for all newly treated cases and 85% success rate in case of re-treatment cases
- Significantly improving the treatment outcomes for drug resistant TB cases
- Decreasing the mortality and morbidity in HIV-TB co-infected individuals
- Improving the outcomes of TB care in private sectors[5].

India, in line with the Revised National Tuberculosis Control Programme has developed objectives for 2020, with milestones for each year, that are aligned with the End TB Strategy. Since the notification of TB has been made mandatory since 2012, there has been a significant increase in the case notification. A web based reporting system Nikshay has been developed. There are ongoing efforts to enhance Nikshay for usage in supporting TB surveillance, drug supply and inventory management. Standards for Tuberculosis care in India have been spelt out in addition in

the National Strategic plan. It extends the provision of care to those in the private sector as well.

Ending the global epidemic of TB and eliminating its social and economic burden is a feasible goal. Failure to do so, is expected to carry serious consequences both individually and globally[10].

In order to improve the case detection rates from the previous 70% to the recommended 90% some of the issues that need be addressed are delay in the diagnosis of TB and associated factors.

2.2 Global burden

Around a third of the world's population is infected by the tubercle bacillus. This means that they have been infected by Mycobacterium tuberculosis but have not yet developed the disease[11]. According to the WHO global report of 2015, worldwide, around 9.6 million cases have been diagnosed out of which, 1 million are children, 3.2 million are women and 5.4 million are men[6]. Out of all those cases, 58% of the cases were from Western Pacific & South-Eastern Asian regions.

Africa had the most severe disease burden in relation with the population. Globally 133 TB cases occur per 1000 people, while in Africa, 281- almost double the number of cases occur per 1000 population.

In addition, tuberculosis is one of the top five causes of death among women in the reproductive age group. In 2014, around one million children developed tuberculosis and one lakh and forty thousand people died due to the disease[6].

People with latent TB infection have a 10% risk of developing the disease in their life time. But, people with compromised immunity, e.g HIV/AIDS, diabetes, malnutrition, tobacco use have a still higher risk of developing the disease. More than 20% of the tuberculosis cases all over the world are attributable to smoking[3]. HIV infected individuals have 20-30 times more risk of developing the active TB. In 2015, one out of three HIV deaths are due to tuberculosis[3].

2.3 Indian burden:

At present, roughly one-fourth (23%) of the global burden of TB is accounted for by India. Out of 9.6 million cases occurring every year, 2.2 million cases occur in our country. This roughly translates to an incidence of 167 lakh cases/year. The prevalence of tuberculosis infection in India is 40%, i.e 2.5 million cases of all forms of tuberculosis. This amounts to 195 lakhs cases/year. The number of deaths due to the disease is 2.2 lakhs which comes to 17 lakh deaths/year[5].

Almost a third of the female infertility in our country is due to tuberculosis. In India, a majority of the TB cases come from poor living

conditions. Their risk of acquiring the disease is enhanced by factors such as overcrowding, poor ventilation, malnutrition etc[2].

In addition, India has the highest burden of both tuberculosis and multidrug resistant tuberculosis and ranks as the second highest in HIV associated tuberculosis, according to the global report of tuberculosis published in 2015[6]. Among the notified cases of pulmonary tuberculosis occurring every year, 71,000 cases are MDR-TB. HIV-TB co-infected cases numbered 1.1 million in 2014, and among them, 31,000 died.

By the time a smear positive tuberculosis is diagnosed, almost 30 to 40% of their contacts are found to be infected. If such a case is left undiagnosed, and thus untreated, a still larger proportion of individuals who are exposed to them will be at an increased risk of getting the infection and acquiring the disease[6].

Some key factors, which determine an individual's exposure risk to Mycobacterium tuberculosis are

1. The prevalence of active TB cases in the community. (The disease burden)
2. The duration of infectivity of the untreated cases
3. The extent and duration of interaction between the cases and their contacts.

Among the above three factors, the duration of infectivity of the untreated cases is important, since it determines the duration and extent of risk to which the general population is exposed to.

In order to address this issue, early case detection along with prompt management with Anti tuberculous treatment will reduce the duration of infectivity of the cases, and thus reduce the risk of exposure in the community[12].

Hence, since the advent of world level and national level programs for tuberculosis, some of the key components which have been emerging are addressing the delay in diagnosis and seeking care. Addressing the social determinants on the patients' side, which lead to delays in diagnosis, addressing the delay in provision of health care, using rapid diagnostics and universal access to services are needed for disease control.

This study seeks to explore the delays in diagnosis of pulmonary tuberculosis and the factors associated with the same.

3. OBJECTIVES

1. To estimate the patient delay in the diagnosis & treatment of pulmonary tuberculosis.
2. To identify the determinants of the above delay.

4. REVIEW OF LITERATURE

The review of literature for this dissertation was carried out using PubMed and Google scholar. The key words for literature search were 'diagnosis', 'delay' and 'tuberculosis'. The individual study articles were critically appraised one by one and presented.

4.1 Organization of the literature:

The studies included in the literature review have been categorized under the following sections

- Measures to control tuberculosis- fixing the targets for case detection and cure rates.
- The trend of case detection & cure rates over time
- Strategies for improving case detection
- Health seeking behaviour among chest symptomatics
- Diagnostic delay in tuberculosis
- Shift from Stop TB to End TB
- Current situation

4.2 Literature review

4.2.1 Fixing targets for Case detection and Cure:

With the rise in the tuberculosis epidemic during the early 1990s, the World health organization declared tuberculosis as a global emergency. In continuance, the DOTS strategy was implemented in 1995 for the control of

tuberculosis. Its strategy was to render the cases non-infectious as soon as possible, that the chances of them spreading the infection to others got reduced. The global targets were 70% case detection and 85% cure rates.

Case detection rate according to WHO is the notification rate of new smear positive cases divided by estimated incidence rate. Cure rate is defined as the proportion of the new smear positive TB cases that were declared cured through treatment[13].

In 1998, Dye et al, had developed a mathematical model to explore tuberculosis control and forecast effects of intensified case finding in the six WHO regions. The case detection rates and cure rates at the time of study i.e1998 were 63% and 57%. According to this study, in the absence of HIV co-infection, ensuring the target of 70% case detection and 85% cure was projected to reduce the incidence rates by 11% per year and the mortality rate by 12% per year. DOTS strategy has a greater impact on the prevention of mortality rather than cases. This difference is accentuated in HIV-TB coinfection. If the targets for both case detection as well as cure rates are achieved by 2010, 18 million cases and 7.3 million deaths could be averted in South East Asian region including India[14].

4.2.2 Case detection and cure rates over the years:

Netto EM et al (1999) assessed the progress in Tuberculosis control from 1995-1996 under the Global monitoring & surveillance project. The case detection rates for Tuberculosis was 39% in 1997, and case detection

rates for smear positives was 51%. They had concluded that excepting Tanzania, Peru and Vietnam, none of the 22 countries with high incidence had achieved TB control targets. Such slow progress was of great concern in 16 countries in particular. i.e India, Nigeria, Indonesia, Pakistan etc[15].

According to a study by Dye et al, (2000) 148 out of 212 countries had adopted the DOTS strategy. Although only 27% of the smear positive patients had been notified under DOTS, there still remained a huge gap between the expected 70% case detection and that current status of 27%. The authors then focused on the 22 high burden countries. Although there had been a significant expansion of DOTS coverage in terms of geography, the case detection had been constant at around 40-50 %. Even with full coverage under DOTS, roughly three- fourths of undetected sputum smear positive cases will still be living in India, Indonesia, China, Pakistan, Nigeria & Bangladesh. The study emphasized the need of developing case finding methods to manage the gaps between the current and target case detection rates[16.]

Sanchez Perez et al (2002), estimated the prevalence of undiagnosed tuberculosis in Chiapas, Mexico. The prevalence of PTB was 151/100,000 population (95% C.I 88-241). The estimated case detection rate at the regional level hospital was 66%. Hence the authors concluded that improved case detection procedures were needed for the control of TB.

In a study by Dye et al (2003), it was found that, the incidence of TB had been on the rise globally, yet, prevalence, incidence and mortality rates were almost stable or had decreased in 7 regions. The exception was the HIV-co infected regions of Africa. The case detection rate globally under the DOTS programme had risen from 11% in 1995 to 45% in 2003. It was projected to reach 60% by 2005. The treatment success rate was more than 80%, with greater than 17 million cases undergoing treatment in the DOTS programme. Hence in order to reduce the prevalence by 50% it was recommended to reach the global targets and to decrease the incidence rate at 2% per year. For reducing the death by 50%, a much steeper decrease in incidence was required at 5-6% decline in incidence/year[18].

Narayanan PR et al conducted a study in 2003, in which they concluded that in India, an evaluation of DOTS strategy was needed for sustaining and expanding the programme in the context of various factors such as multidrug resistant TB, HIV/TB co-infection, and suboptimal health care services. The authors reported that the priority research areas in TB in our country has shifted to other areas such as: Involvement of private sectors, assessing the risk factors for the delay in diagnosing tuberculosis, and measuring the current burden of the disease[19].

4.2.3 Strategies for improving case detection:

1. Active case finding:

In a study by Becerra et al, in 2003, it was found that household screening & contact tracing improved case detection rates for tuberculosis. They compared active & passive case finding approaches in a high incidence town in Lima, Peru. The results of the study showed that prevalence of TB detected through active vs. passive case finding among household contacts were 0.91% and 0.18% respectively. Among the neighbours of TB patients, the prevalence was 0.22% and 0.08% respectively. Hence the case detection rates among symptomatic contacts and neighbors were significantly higher. Thus the authors suggested that, a combined approach of active & passive case finding may improve case detection rates than passive case finding alone[20].

Golub et al (2005) conducted a review on case finding strategies in TB. Active & passive case finding approaches were evaluated on their impact in improving case detection rates. They concluded that active case finding strategies had been successful in the contexts in which they were implemented. Among the included studies, it was found that, many cases detected through active case finding had already sought health care for their symptoms. But they were not being tested for or diagnosed with TB. This indicated a need to upscale passive case finding approaches as well, in areas with a high incidence. Another component for a successful passive case finding would be increasing the awareness among communities on

symptoms of TB, so that more people seek health care. Focusing case finding strategies on symptomatic surveys and further screening of symptomatics would be a cost effective method[21].

In a study by Heller et al (2006), the two population intervention measures viz. case finding and DOTS strategy were compared. The study was conducted in India, utilizing national data and published literature. Data on the incidence/prevalence of smear positive TB cases was included. Relative risk reduction resulting from an increased case finding and use of DOTS were computed. From the results, it was observed that, while the DOTS strategy might prevent 0.188 deaths from Tuberculosis, increasing the case finding would prevent 1.79 deaths in comparison. The costs of DOTS were 5960 International dollars while in contrast, the costs for increasing the case finding were 4839 Int. dollars. Hence it was recommended to prioritize interventions to the populations[22].

Yimer et al (2009) in Ethiopia, sought to assess an active case-finding strategy to identify the smear positive TB patients in Ethiopia. They conducted house to house visits to identify chest symptomatics and TB cases. In conclusion it was found that the ratio of cases identified via active and passive case detection is 2.5:1. This implied that there are 2.5 undetected TB cases for every smear positive case undergoing treatment in that study period. A high proportion of undiagnosed tuberculosis cases were identified through this study. This in turn, indicated the high infectious pool

and significant transmission of the disease. Expanding the diagnostic facilities, actively involving the health extension workers was recommended for early case detection and management of tuberculosis[23].

2. Referral of Chest symptomatics:

Another approach that was being studied was intensified referral of chest symptomatics. Bai et al (2007) in Hunan, China, used a public-private mix (PPM) model. They included the village doctors and private sector for intensified identification of TB suspects and prompt referral. They traced the referred TB suspects, if they fail to report to the TB clinics. Through this strategy, the referral of TB suspects increased five-fold during the project year. The latter strategy of patient tracing did not yield significant results[24].

3. Training of health care personnel:

Wahyuni et al (2007) in Indonesia, assessed the obstacles for case detection of TB in primary health care. They found that there was a need for improvement in knowledge of health care staff on tuberculosis. Among the laboratory technicians only 55% had been able to identify all the positive sputum smear slides. Training of health care staff tuberculosis control was recommended in order to improve case detection & diagnosis of TB[25].

4. Involving community level health workers:

Between 2006 to 2008, Datiko et al, conducted a community randomized trial in Ethiopia. They studied whether involving trained community level health workers in tuberculosis control improved the case

detection and treatment success rates. After the intervention, the mean case detection rate in the intervention group was 122.2% compared to 69.4% in the control group. The treatment success rates were higher as well, estimated at 89.3% vs 83.1% in the intervention and control groups respectively[26].

The authors concluded that involvement of health extension workers improves the case detection and treatment success rates in smear positive cases. The authors recommended implementing this approach especially in low health service coverage settings and where there is shortage of health workers.

Calvin et al, (2009) evaluated community level health interventions to improve case detection of TB in Tanzania. Training of traditional healers/pharmacists on referring TB suspects, training TB patients on raising community awareness, sensitizing community leaders on TB control were some of the interventions that were implemented.

Two years after the implementation of this approach, the notification rates for smear positives had increased by 68%. The referral network with traditional healers, pharmacists etc. contributed to 38-70% of the new TB cases notified.

Hence the authors concluded that community based interventions have the potential to contribute to improved TB case notification. They

recommended further research to include cost-effectiveness analysis, for determining the best combination of such community based activities[27].

5. Early health care seeking for cough symptoms:

Sekandi et al (2009), studied active case finding in undetected tuberculosis in a peri urban slum of Uganda. They found that 20% of the study population were chronic coughers, and among them, 18% had TB. They concluded that while active case finding approaches can supplement the routine DOTS, its feasibility and cost effectiveness need additional evaluation. In addition, there needs to be an increased emphasis on early health care seeking for cough symptoms[28].

Determinants of case detection for TB:

Daniel Okuonghae in Nigeria (2009) carried out a survey to study the determinants of case detection for TB. The authors mentioned that the case detection had remained consistently low and was 21% in 2003, while the treatment success rate was 59%. Some key recommendations from the study were- raising awareness on TB through media, active case finding of chest symptomatic patients with cough >2 weeks, free diagnostics and treatment facilities for TB and routine testing in high density areas such as schools, markets etc[29].

Risk factors for inadequate case detection:

Van't Hoog et al(2013) in Kenya studied the risk factors for inadequate case finding in TB. Among those who were smear positive &

HIV negative, the median duration of cough was 6.9 months. The authors recommended increasing suspicion of TB among women and older age groups for improving the case detection[30].

The trend through the years:

In the study conducted by Lukudu et al in 2009 in Sudan, the trend of case detection was assessed over time from 2002-2009. It was found that the case detection rates remained consistently low over time, well below 50% of the expected for those years. The treatment success rates on the other hand remained high and stable at 80% on average. The consistently low case detection rates necessitated the study of health seeking behaviour among chest symptomatics[31].

4.2.4 Health seeking behaviour among chest symptomatics:

In a cross sectional study by Fochsen et al (2006) in India, the prevalence of cough was 2.8% and 1.2% respectively among men and women. Majority had sought health care for their cough symptoms but a mere 23% visited a public health care provider. Among the patients who sought health care for their symptoms, only 13% had been prescribed a sputum smear examination. The authors concluded that low utilisation of public health services and less sputum examinations illustrated the need to improve diagnostic practices and the involvement of private health care providers in TB control activities.

Kasse et al (2006), in Gambia[33] assessed the health seeking behaviour, health system experience and case finding in TB among individuals with cough. Among the individuals with cough, 81% had sought health care and the median time to seek health care was 2 weeks[32].

Zhang et al, (2007) explored the perceptions regarding TB and health care seeking behaviour among rural patients. The study concluded that 60% of respondents were able to identify cough for prolonged duration as one of the main symptoms of TB and 40% perceived that tuberculosis was transmitted by close interaction with a TB patient. Socio-economic status had an association with the respondents' perception of the disease. Lower levels of education, income and increasing age were identified as being less likely to seek health care, or seek care at a cheaper place. In conclusion, the authors have mentioned that social stigma and perceptions regarding TB influence the health care seeking behaviour. And hence, accessibility and affordability issues have to be addressed in addition to expanding the DOTS approach[34].

Wang et al in 2007, conducted a study on the health care seeking pathways for TB patients in rural China. In this study, only 13.3% of the patients had presented to the local TB dispensary directly after the onset of symptoms. The median health care provider delay was only one day in a TB dispensary. The authors recommended improving direct referral to TB clinics from health providers to shorten the TB diagnostic delays[35].

A study was conducted by Rumman et al (2008), on the prevalence of TB suspects and their health care seeking behaviour. Among those surveyed, they identified 2.51% as TB suspects. Their first action after the onset of symptoms was to seek health care by visiting health centres. The accessibility of health care facilities and confidence in obtaining cure were the reasons mentioned for timely seeking of health care. Economic constraints and belief that the symptoms would be self-resolving were the obstacles to seeking timely health care. The authors recommended upgrading the centres and training the health workers on suspect management in TB[36].

Charles N. et al in South India in 2008, studied health care seeking among chest symptomatics. The study was conducted in 2 rural and 2 urban areas in South India. According to this study, there was a median duration of 10 days between the onset of symptoms and seeking health care. Longer delays in seeking care were reported among chest symptomatics >45 years of age and among those who had underwent prior ATT. The reasons for delay identified through this study were work pressure, less severity of symptoms and dissatisfaction with facility. Other reasons included financial constraints, lack of proximity, inconvenient working hours and alcohol dependence. The authors mention that though majority of chest symptomatics sought health care, quite a significant proportion either delayed health care seeking or took no action. The recommendations from this study included the need to increase the levels of awareness on the

community levels on TB, especially among urban and the older age groups. The increase in knowledge levels coupled with the behaviour change was emphasized in chest symptomatics, older age groups and the previously treated TB patients[37].

Yimer et al (2009) studied health care seeking behaviour among PTB patients and suspects in rural Ethiopia. As per the findings of the study, a majority of TB cases (82.5%) and TB suspects (78%) took health care actions for their symptoms. There was median delay of 30 days before the first action was taken. Those having a prior history of TB or with prolonged duration of cough were more likely to visit a medical health care provider. The authors recommended involving all health providers in case finding, and making rapid TB diagnostic testing available at even the lowest health care levels for improving the case detection[38].

Mesfin et al, in 2009, conducted a study on the delayed health care seeking among PTB patients in Ethiopia. Among the study population, the patients received treatment from some informal sources e.g rural drug vendors and traditional healers prior to the first consultation at a public health care facility. There was a median patient delay of 30 days (mean=60 days) Among the patients, 53% had delayed the first consultation for $\geq$ 30 days. Significant patient delay related factors were illiteracy, residing in rural areas, lack of awareness on TB. The authors concluded that nearly half of the pulmonary TB patients had delayed health care seeking at a public

health care facility, and instead obtained treatment from informal sources. Involvement of informal sources for early referral of TB suspects, creating awareness among the public on TB was recommended to help reduce the delays in commencing treatment[39].

Biya O et al in 2010 conducted a study on knowledge, care seeking behaviour and factors associated with patient delay among PTB patients in Nigeria. In this study, multiple care seeking and unsatisfactory knowledge of TB were associated with patient delay. The authors recommended strategies to promote early health care seeking in DOTS centres and sustained awareness on TB[40].

Ghosh S et al (2010) studied the care seeking behaviour of chest symptomatics in a slum in West Bengal. The prevalence of chest symptomatics was found to be 5.5%. Among them, three- fourths sought relief from a health care provider, 70.8% did within 2 weeks, with a median duration of 7 days. Work pressure (25%), less severe symptoms (56.3%) and health care costs (18.7%) were the reasons identified for delay in seeking care through this study[41].

Sathyanarayana et al (2011) conducted a study in India on the health care seeking among patients having cough for ≥ 2 weeks. Among the 4562 people interviewed, 437 (9.5%) reported having a cough of ≥ 2 weeks in the past 2 months. 69% The proportion of cough symptomatics who had not visited a health care provider was 69%. The proportion was higher in rural

areas, as well as northern and eastern zones of the country. The authors inferred that relying on passive case finding alone was insufficient, and hence it was necessary to review the current approaches in India. The need of further studies was emphasized to understand why the chest symptomatics did not seek health care[42].

Hoa et al (2011) studied the health seeking behaviour among adults with chronic cough in Vietnam. They conducted a cross sectional survey and used history of cough/ATT/Chest X ray as screening tools. Prolonged productive cough was reported by 4.6% of the study participants. Among them 44% sought health care in places such as pharmacies, public hospitals, commune health posts and private health care physicians as their first point of contact. Only 7% had undergone a sputum smear examination. Of the symptomatics, 2.9% were diagnosed with TB. The mean patient delay was 4.1 weeks among cough suspects and 4 weeks in TB cases. The authors concluded that the study finding highlighted the need to improve diagnostic practices by retraining staff on sputum smears examinations for TB suspects[43].

In rural Nigeria, Ukwaja et al (2013) studied the health care seeking behaviour, treatment delays and their determinants in TB. The country had a case detection rate of 40% at the time of study. Among the study participants, 84% reported consulting a non-TB care provider. In such patients, drug shops, traditional healers and private hospitals were the first

facilities visited after the onset of symptoms. There was a median total delay of 11 weeks and a median health system delay of 3 weeks. Some of the factors associated with patient delay were older age, long walking distance to a public health care facility and urban residence. The factors associated with prolonged health system delay were male gender and initial visit to a non-TB care provider. The authors recommended improving the access to care, educating patients, engaging the informal health care providers and strengthening public-private models for TB control in order to have a positive impact on treatment delay[44].

In a study by Engeda EH et al (2015) in Ethiopia, it was found that 39.1% of the TB suspects had not visited a modern health care facility during the study period. Factors that were associated with not seeking a modern health facility included older age, educational level and unemployment. The authors recommended that interventions targeted at reducing unemployment, improving literacy rate, improving socio-economic status would be needed for reducing delays[45].

4.2.5 Diagnostic delay in Tuberculosis:

Lawn et al(1998) carried out a questionnaire survey of 100 newly diagnosed smear positive adults in Ghana. As per the study, there was a median delay of 4 months in diagnosis. The total delay exceeded even 6 months in 44% patients. The median delay from the first consultation with a doctor till diagnosis was 8 weeks, which was double the median delay on the

patients' side. The significant factor associated with doctor delay was failure to perform Sputum AFB. Low diagnosis rates were seen in particular among rural government institutions and private practitioners. The authors recommended decentralizing the diagnosis and management of TB program in Ghana, making sputum microscopy widely available along with providing rigorous training to health personnel[46].

In a systematic review carried out by Sreeramareddy CT et al using research articles published between 1990-2008, the health seeking behaviour of chest symptomatics as well as suspicion of TB among them were found to be inadequate. Hence if there is a significant delay in diagnosis, active case finding, rather than passive case finding was recommended as one of the strategies to address this issue.

According to these studies, total delay ranged from 25 – 185 days, patient delay: 4.9 – 162 days and health system delay: 2 – 87 days. The delays were similar on the patients' as well as health system sides averaging 28.7 days and 25 days respectively[47].

A study was conducted by Godfrey-Faussett et al (2002) in Urban Lusaka, Zambia on the reasons for delayed health care seeking in patients with cough. Among the 427 patients interviewed, 35% had delayed seeking care for more than a month. Older age, poor perception of health services, severe underlying illness, prior attendance at a private clinic, distance from the clinics were associated with delays in seeking care. In contrast to the

other studies, there was no relationship between delay and knowledge about TB, socio-economic status, education and gender. Stigmatising attitudes especially linking HIV and TB were not associated with longer delays. Investment in improving the health system, ensuring accessibility for groups such as older patients and the more disabled were recommended to reduce the delays in diagnosis and thus help in control of TB[48].

Rajeswari et al (2002) in India, studied the factors associated with patient and health systems delays in the diagnosis of TB. The median patient delay, health system delay and total delays were 20 days, 23 days & 60 days respectively. Among the patients, 29% delayed care seeking for more than a month. Among them, 40% attributed the delay to the lack of awareness on TB. Residing at a distance of >2 km from a health care facility and alcoholism were also associated with a greater patient delay. In 69% of the patients the health system delay was >7 days. Shorter duration of cough, first visit with a private health provider were some of the factors associated with health system delay. Total delay resulted mostly from a long patient delay when government health care providers were consulted first, and when private providers were consulted first, it was associated with a long health system delay

The authors recommended increasing the public awareness regarding chest symptoms and the availability of free diagnostics. Educating the government and private health care physicians to make them aware about the

possibility of TB during the examination of out-patients was also suggested[49].

Selvam JM et al(2003), studied the health care seeking behaviour of new smear positive TB patients. Among the study participants, 65% contacted a health care provider within 28 days, 47% of these contacted a government health care provider and 53% contacted a non-governmental provider. Median total delay, patient delay and provider delay were 62 days, 28 days and 28 days respectively. Health care provider delay was 9 days in the government sector and 50 days with the private providers. Smoking and mode of travel were significantly associated with patient delay. First consultation with a private health care provider and residing at a distance of >5 km from the health care facility were associated with provider delay. Among the participants, 25% took >2 actions before being diagnosed. The study authors recommended that the community awareness on TB needed to be increased. Greater involvement of the private sector in the RNTCP was mentioned to be essential for reducing the provider delays[50].

Odusanya et al (2004), studied the patterns of delays among PTB patients in Lagos, Nigeria. They had defined patient delay as presentation to a health facility 30 days after symptom onset. Doctor delay was defined as patients staying for >15 days with the referring doctor. Among the 141 study participants, 83% delayed seeking health care by >1 month after onset of symptoms. The median patient delay was 8 weeks, median doctor delay was

1 week and median total delay was 10 weeks. The prevalence of doctor delay was 18%. Similar to other studies, patient delay was the most frequent delay observed and also contributed to majority of the total delay. Unlike some other studies, there was no significant association of patient delay with factors such as socio-demographic characters such as age, gender, education etc. Only 74% of the patients went to some type of health care facility as the first point of contact. 26% of the patients sought chemists, prayer houses as their first point of contact. The authors recommended patient education on TB to help reduce delay in the initiation of treatment[51].

Kiwuwa et al (2005) studied the patient and health services delay in PTB. They also analysed the factors contributing to such delays. The median total delay till the initiation of treatment was 12 weeks. The patients often sought treatment in pharmacies or private clinics more than government health care facilities as initial contacts. Hospitalization, alcohol consumption, perceiving smoking to be a cause for TB were some important predictors of patient delay. On the health care side, >2 health seeking encounters/month was an independent predictor. Educational status and perceived stigma on TB were not associated with both delays.

The authors have concluded that educating the general population on TB and seeking appropriate medical help would be more likely to improve case detection. Efforts were to be targeted at high risk groups such as alcoholics for improving the accessibility to treatment of TB[52].

Tobgay et al in 2006 conducted a study on the predictors of treatment delay for TB in Sikkim. The study reported median patient and health system delays of 21 days & 7 days respectively. Among the participants 17% reported a patient delay of >30 days and 49% reported a health system delay of >7 days. Factors associated with patient delay were self-medication and use of traditional healers as the first point of contact. Independent predictors of health systems delay were first point of contact with private doctors and treatment cost. The recommendations made by the authors included efforts to increase awareness on avoiding self-medication, availability of free treatment, training of traditional healers, private doctors in treatment of TB[53].

Mfinanga et al (2006), conducted a cross sectional survey in Dar es salaam, on the magnitude and factors for delay in the management of TB. The prevalence of diagnostic delay was 52.9% and it was significantly higher in females compared to males. Risk factors for delay included residing >5km from a health facility, unemployment and lack of primary education. The authors concluded that there were significant delays in managing TB patients. It was contributed both by the patients as well as the health care facilities. But, for most patients, delays were due to the delay of diagnosis and treatment in the health facilities. All the delays were more common in the female gender. This indicated the need for targeting the health seeking behaviour of individuals and improvements in health system[54].

WHO Eastern Office for the Eastern Mediterranean conducted a multi country study in 2006, on the diagnostic and treatment delay in TB. The entire duration from the time of symptom onset till treatment was categorized and factors causing treatment delay were identified. The results of the study showed that mean duration of delay from symptom onset till ATT initiation ranged from 1.5 to 4 months in different countries. Patient delay ranged from 9.9 days to 69 days. System delay ranged from 5 to 75 days. Some of the main determinants of delay included,

- Socio-demographic: Illiteracy, residing in suburban areas
- Economic factors
- Stigma
- Time taken to reach the health facility
- Seeking health care from non-specialized individuals
- Visiting >1 health provider before being diagnosed.

The conclusion from that study was that there was an unacceptable delay among all countries in the treatment of TB. In a few countries, it was mostly attributed to delayed diagnosis, while in others, it was also due to inadequate health seeking behaviour[12].

In a study by Xu B et al(2007), on health care seeking among chronic cough patients in China, it was found that the mean patient delays were 34 days & 29 days in their two provinces of Jianhu and Funing respectively.

Availability of medical insurance was found to be associated with a shorter patient delay[55].

Leung et al (2007) studied the delayed presentation and treatment of newly diagnosed PTB patients in Hong Kong. Among the study participants, 42.6% presented to the private doctors first, while 57.4% to the public health care sector. Among those presenting to the private sector, 13.7% were diagnosed with TB while in contrast, 86.3% of the patients presenting to the public health care facilities were diagnosed. The median patient delay as well as health care provider delay were 20 days[56].

Factors which were associated with a longer patient delay included smear & culture positivity and unemployment. The predictors for longer provider and total delays were age >60 years, no initial sputum smear examination and chest X ray diagnostics. In conclusion, non-specific presentations and adverse social factors are associated with prolonged patient delay, while older age groups, unavailability of bacteriological/radiological evidence were associated with diagnosis and treatment delays.

A systematic review was conducted by Storla DG et al in 2008, on the delay in diagnosing and treating TB. The authors included 58 studies addressing the research question. The major factors associated with diagnostic delay according to the study are HIV infection, concomitant lung diseases, smear negative TB, low geographical/socio-psychological

accessibility, rural residence, visit to a lower level government health care facility/private practitioner or a traditional healer, poverty, old age, female gender, substance abuse e.g alcoholism, low educational status, low levels of awareness on TB, stigma and self-treatment. Thus it was inferred that the core issue in diagnosing and treating TB was repeated visits to the same health care. This resulted in non-specific treatment with antibiotics along with failure to access TB services. But once TB was diagnosed, treatment had been initiated within a reasonable time period[57].

Basnet et al (2009) conducted a similar study in Nepal for identifying the reasons for delay in diagnosis and treatment of TB. In 2006, the case detection rate of smear positive TB was 64% and the treatment success rate in 2005 was 88%[58]. The other results of the study were as follows: There was a median patient delay of 50 days, median health system delay of 18 days and median total delay of 60 days. Smoking >5 cigarettes/day had a higher risk for patient delay and health system delay. The authors recommended increasing the public awareness regarding TB and expanding health facilities with quality assurance to help in reducing the diagnostic delay.

In a study conducted by Ananthakrishnan R et al, on diagnostic delays among TB patients in Chennai, there was a median patient delay of 18.3 days. Multiple care seeking was one of the factors associated with patient delay[59].

Lock WA et al (2011), studied the determinants for patient delay in TB suspects. The authors studied the TB suspects registered at the lung clinics. Among them, the median patient delay was 14 days, ranging from 0 to 145 days. Patients with multiple symptoms reported to the health care earlier. Factors such as marital status, education, occupation, self-medication, using traditional medicines and visiting traditional healers were significantly associated with the patient delay.

As to health care seeking, accessibility in terms of distance and travel time were significant factors in choosing the type of health care sought, rather than the quality of services rendered there. The conclusion arrived at this study was, accessibility of health care providers was the main determinant for patient delay, although the roles of psycho-social factors could not be excluded entirely. Suburban and urban areas have relatively better access to health care and hence the delay is lesser[60].

A systematic review was performed by Ngangro et al (2012) on the determinants of TB diagnostic delay in countries with limited resources. According to this study, some of the factors associated with delay were

- Low income
- Rural life
- Ageing
- Misunderstanding the microbial cause for the disease
- Low health care coverage

- Initial visit to a non-skilled professional or a traditional healer

The authors recommended active case finding strategy for helping diminish the diagnostic delays in high endemic, low income countries. Marital status, occupation, residence (urban / rural), highest education, socio-economic status, usage of self-medication/traditional medicine, visiting a traditional healer or the serious symptom of haemoptysis were significantly associated with patient delay[61].

Belay et al (2012), studied the diagnostic and treatment delay among TB patients in Ethiopia. As per the study, the median patient delay was 20 days and the health system delay was 33.5 days. At least 50% of the patients were able to contact health facilities within 2 weeks of onset of cough symptoms. While the median treatment delay was only 1 day, the total median delay was 70.5 days. It was found that, initial visit to non-formal providers and self-treatment were found to be independently associated with patient delay. Extra pulmonary TB, visits to health posts/clinics and private health care facilities were predictors of health system delay. The authors have concluded though a majority of TB patients do report to the health care system in a relatively shorter time, there is still a long delay in the diagnosis and treatment initiation for TB. The recommendation from the study was training and supervision of health workers and decentralizing DOTS services[62].

Rossato Silva et al (2012) conducted a study on the factors associated with delayed diagnosis of TB among hospitalized patients. This study was performed in a tertiary care setting unlike the other studies. In addition, the study region was a high TB and HIV burden area. In this study there was a median delay of 6 days till diagnosis from the time of admission. Among the admitted, 54.4% were diagnosed at ≤ 6 days after admission and 45.6% >6 days after admission. Extra-pulmonary TB and sputum smear negativity were the main factors associated with diagnostic delay of >6 days. In contrast to most other studies, current smoking status was associated with an earlier diagnosis. TB cases who smoke were more likely to present with cough symptoms and breathing difficulty, and less likely to present with extra-thoracic TB than the cases who never smoked. Smokers were also more likely to have cavitations, upper-zone lung involvement, sputum smear positivity and pulmonary TB than the never-smoking cases of tuberculosis. In addition, unlike some other studies, the presence of cough was an associated factor in positive diagnosis. Since, the study was conducted in hospitalized patients, the presence of cough symptoms was related to rapid isolation & treatment. The authors have acknowledged that in other studies, cough, especially chronic cough is a cause of late presentation of patients to health care systems. Chest X ray features such as cavitary lesions, military TB were also associated with an earlier diagnosis in this study.

The authors have mentioned that, the study data did not show an increased mortality among patients with delay in diagnosis. The limitations of the study which were acknowledged are:

1. The study evaluated only the health system delay and not the patient delay.
2. The study was conducted in a single centre and hence may not be generalizable to other settings
3. Data collection was retrospective and might not be as accurate and complete.

Despite such limitations, the study concludes that studying factors associated with delayed diagnosis has an impact in the transmission dynamics of TB. Hence identifying the sources of delay is a critical issue for effective TB control[63].

Li Y et al (2013), performed a systematic review and meta-analysis on the factors associated with diagnostic and patient delays for TB in China. Determinants for patient delay were rural residence, poverty, lack of health insurance, stigma on TB, lower educational levels. Determinants for health system delay include factors such as geographical barriers and lack of qualified health care workers. The practice of seeking health care from traditional Chinese medicine providers first was an additional risk factor for diagnostic delay. They recommended reducing stigma, removing financial

barriers for access to health care and integrating informal sectors for the control of TB[64].

Hamza et al (2015) performed a study on the delay in diagnosis among PTB patients in Oromia, Ethiopia. Among the patients enrolled, 36.7% experienced patient delay, 49.7% health system delay and 48.9% total delay. The median patient delay, health system delay and total delays were 30 days, 9 days and 40 days respectively. Poor knowledge regarding TB, self-treatment, alcoholism and lack of money for health related expenditure were independent predictors for patient delay. Predictors for health system delay were visiting multiple health care providers & HIV negative status. Thus the authors concluded that patient delay contributed to 4.4% of the total delay in diagnosis of PTB. Community based interventions were needed to address the issues of self-treatment and lack of knowledge regarding TB[65].

Osei et al (2015) studied the factors associated with delay in diagnosis of TB in Ghana. In this study, the median total delay was 104 days. Patient delay and health care delays were 59 days and 45 days respectively. Perceived stigma on TB and not being medically insured were risk factors for prolonged patient delay. The only risk factor associated with health care delay was multiple health care contacts following signs & symptoms. In conclusion, patient delay is the main cause for the delay in detection of TB cases. The recommended measures included strengthening

the healthcare system towards decentralizing the diagnosis and management of TB, training health care providers, collaboration with the non-formal health care providers and raising the public awareness about TB[66].

Cai J et al conducted a systematic review and meta-analysis on the factors associated with patient & provider delays for diagnosis and treatment of TB in Asia. Some factors identified for patient delay were low income, unemployment and smear positivity. Consultation at a public hospital was one of the factors associated with the provider delay. Male gender and long distance to a health care facility correlated with both patient and provider delays. The authors suggested that availability, in particular, timeliness of public health providers should be the primary concern for policy makers. However, they acknowledged that the studies included were not comparable because of their weak study designs and various cut off points were used for the duration of delays, particularly the provider delay. They mention the need for further studies with stronger study designs for establishing causality. In addition, the need for a standard definition of delay has also been emphasized to facilitate more appropriate comparison across the various studies[67].

4.2.6 The shift from Stop TB to End TB strategy:

The year 2015 has been a turning point in the fight against TB, as per the WHO global report of 2015. 2015 is the deadline for the targets set in the Millennium Development goals and the shift to the targets in the Sustainable

Development Goals. It also marks the watershed from the Stop TB strategy to the End TB strategy[6].

The vision of Stop TB strategy was a TB free world. Its goal was to dramatically reduce the global burden of TB in accordance with the Millennium Development Goals. The targets were 1) To halt and reverse the incidence of tuberculosis by 2015. 2) By 2015, to reduce the prevalence and deaths due to TB by 50% compared to a baseline of 1990 and 3) By 2050, to eliminate Tuberculosis as a public health problem[9.]

The End TB strategy in contrast had a vision to end the Global TB Epidemic. The year 2015 was taken as the baseline. The targets were 1) 90% reduction in the number of deaths by 2030, and 95% reduction by 2035. 2) 80% reduction in TB incidence rate by 2030 and 90% by 2035[10].

4.2.7 Current Situation:

As per the statistics in the 2015 Global TB report, 6 million TB cases were reported to the WHO in the year 2016. Which means, that among the 9.6 million cases world-wide, only 2/3rds or less cases have been reported. In other words, 37% of the cases were left undiagnosed or left out from being reported. India has achieved the 2015 MDG goals of 50% reduction in prevalence and 50% reduction in mortality rate compared to 1990[6].

The case detection rates in India over time are mentioned in table 1.

Table 1: Case detection rates over the years

Year	**Case detection rate % (95% C.I)**
1995	59 (56-61)
2000	49 (47-51)
2005	48 (47-50)
2010	59 (55-62)
2014	74 (70-80)

Source: WHO Global report on TB (2015)[6]

Thus, there is still a long way to go in meeting the target of 90% case detection. In addition, there is still a need for efforts to improve the case detection, and reduce the delays in diagnosis. For this, the factors causing such delays need to be studied. This needs to be done in the Indian context, because of the lower case detection rates, despite improvements in reporting system. This study seeks to address the same.

5. MATERIALS & METHODS

5.1 Study Design:

Cross sectional study

5.2 Study duration:

July 2015 to July 2016

5.3 Target population:

Patients with pulmonary tuberculosis.

5.4 Study population:

Newly diagnosed pulmonary tuberculosis patients on intensive phase of Category 1 ATT in Zone VIII of Chennai Corporation.

5.5 Sample population:

Pulmonary tuberculosis patients who are registered in Zone VIII during the study period on intensive phase of Category 1 ATT.

5.6 Inclusion criteria:

- Age ≥18 years
- Resident of Chennai Corporation Zone VIII
- Undergoing Category I ATT- intensive phase

5.7 Exclusion criteria

- HIV/TB co-infected patients (since they are being screened for chest symptoms during their visits to the ART clinics)

5.8 Sample size:

Studies have shown that around 69.4% of the patients were not diagnosed at their first point of contact with a health facility[59].

Hence taking P as 69.4% with 5% alpha error and relative precision (E) of 10%, using the formula

$$\underline{N=(Z_{\alpha/2})^2(PQ)}$$

$$E^2$$

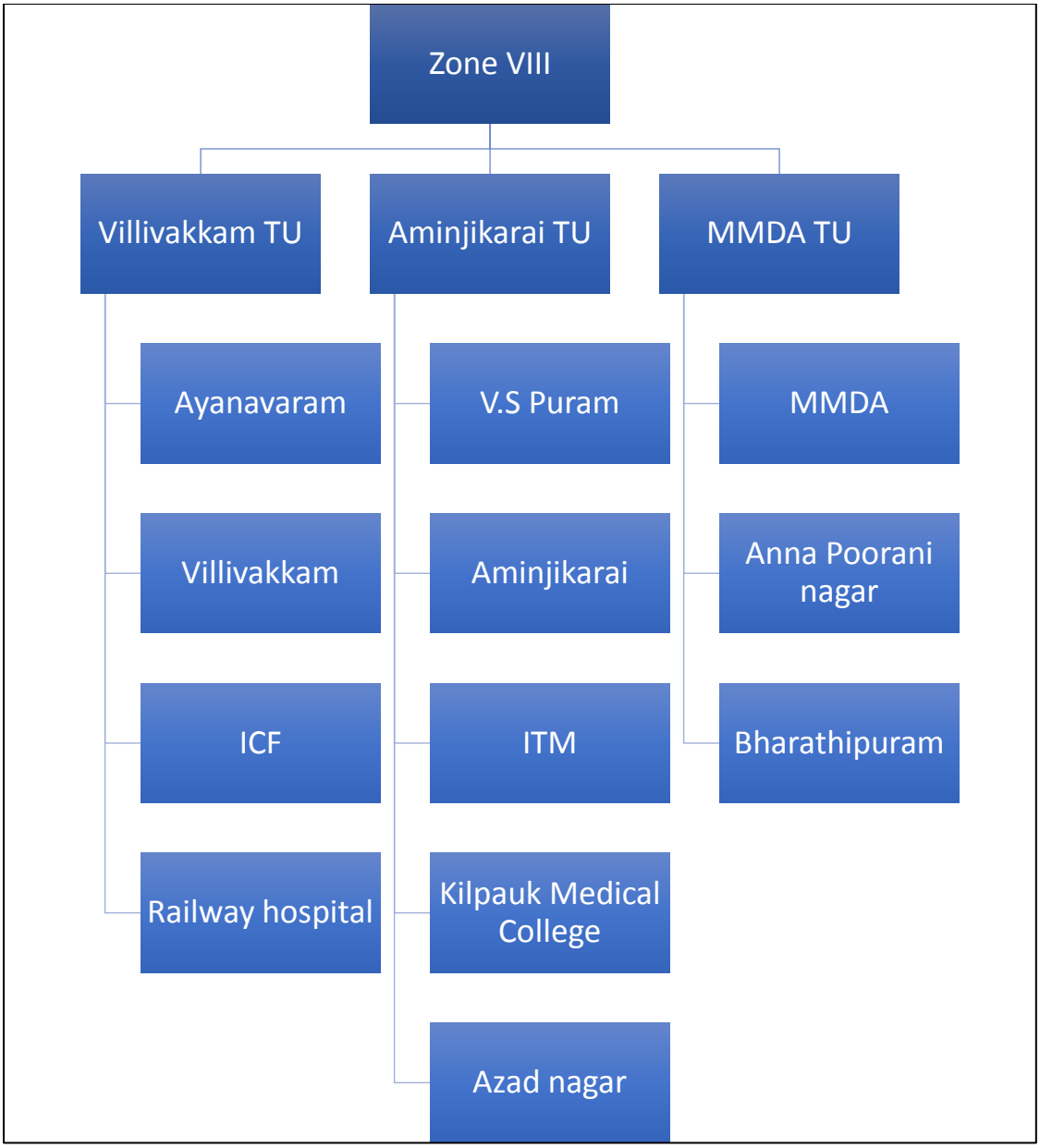
the sample size is calculated to be 177. Including 10% of non-responders, the corrected sample size is 197.

5.9 Sampling Method:

Around 20 patients are being registered every month at the three Tuberculosis units of Zone VIII. Thus it was estimated that it will take approximately 10 months to reach the required sample size. After obtaining approval from the Institutional Ethics Committee, all patients satisfying the inclusion criteria who are registered at the three Tuberculosis units of Zone VIII were taken up for the study till the desired sample size was reached.

5.10 Data collection procedure:

- The protocol was submitted to the Institutional Ethical Committee for approval.
- After obtaining IEC approval, permission to conduct the study was obtained from the Corporation of Chennai after getting the requisition forwarded from the RNTCP Programme manager.
- Zone VIII of Chennai Corporation has Three Tuberculosis Units, Villivakkam, Aminjikarai and MMDA.



- Each Tuberculosis Unit has DOTS centres in its treatment area. DOTS services are provided on alternate days. Viz Monday, Wednesday, Friday or Tuesday, Thursday and Saturday.
- The Tuberculosis Units were visited by the investigator and permission was obtained from the Medical Officer- TB Control.

- With the help of Medical Officer- TB control & Senior Treatment Supervisor, the patients satisfying the inclusion criteria were identified and enrolled in the study.
- Patients were interviewed when they came for DOTS to their respective DOTS centres.
- The procedure was continued till the desired sample size was reached.

5.11 Questionnaire:

A standardized WHO questionnaire on diagnostic delay (ANNEXURE III) adopted from a study on Eastern Mediterranean regions[12] was used for this study. It was translated into the local language Tamil (ANNEXURE IV) using a TB expert and a Tamil Professor, then back translated & compared. The questionnaire was pilot tested to check for discrepancies and modified. After explaining the study details to the participants and obtaining informed consent, it was administered by the investigator using the interview method. The questionnaire had sections pertaining to the following:

- Socio demographic characteristics
- Co-morbidities: Diabetes, Hypertension, COPD
- Onset of symptoms: Cough, fever, loss of weight, haemoptysis
- Health care seeking behaviour for symptoms – health care provider or others
- Reasons for consultation/non consultation with health facilities
- Perceived causes for delay in seeking health care

- Satisfaction with care offered at health facilities
- Stigma & knowledge on TB
- Delays in the diagnosis and treatment of TB – patient delay, health system delay, diagnosis delay, treatment delay and total delay.

5.12 Study variables

5.12.1 Independent variables:

1. Patient related: Age, gender, educational status, occupation, income, place of residence, marital status, smoking status, health seeking behaviour, knowledge & stigma regarding tuberculosis
2. Health system related: Satisfaction with care offered at health facilities, time taken to reach health facilities

5.12.2 Dependent variable:

Total delay in the diagnosis & treatment of tuberculosis.

5.13 Operational definitions:

5.13.1 Occupation: Classified according to the Minimum wages act[68]

- **Unskilled**: Performing simple duties which require experience of no or little independent judgement or prior experience, though familiarity with occupational environment is necessary. In addition to physical exertion, their work may require familiarity with a variety of articles/goods.
- **Semi-skilled**: One who performs work generally of a defined routine nature, wherein a major requirement is not as much of

the judgment, skill, for proper discharging of duties assigned to them, or a relatively narrow job and where others make important decisions. The work is thus limited to performance of routine operations of limited scope.

- **Skilled**: One is capable of working efficiently, exercises independent judgment, discharges duties with responsibility. They must possess a comprehensive knowledge of the trade/industry in which they are employed.
- **Highly skilled**: One who supervises the work of skilled employees.

5.13.4 Residence:

- **Urban residence:**

'Towns (places with municipal corporation/municipal area committee, town committee, notified area committee or cantonment board), places having 5000 or more inhabitants, density not less than 1000 persons per square mile or 390 per square kilometres and at least three-fourth of adult male employed other than agriculture'[2].

- **Urban slum residence:**

A Slum, as per Census, is defined as 'residential areas where the dwellings are unfit for human habitation by reasons of dilapidation, overcrowding, faulty arrangements & design of such buildings, narrowness, faulty arrangement of streets, lack of ventilation, lighting, sanitation

facilities or any combination of such factors which are detrimental to the safety and health[69]. Residences which are enlisted as slums in Census data were categorized as 'Urban Slum'

5.13.5 Health care facility:

All Government & Private health facilities manned by a qualified health care provider[12].

5.13.6 Pulmonary tuberculosis:

Refers to any bacteriologically confirmed or clinically diagnosed case of tuberculosis involving the lung parenchyma/trachea bronchial tree[2].

5.13.7 Total delay:

The time interval between the onset of illness to the initiation of Anti-tuberculous drugs. It is the sum of diagnostic delay and the treatment delay. The delays are measured in days.

5.13.8 Diagnostic delay:

The time interval from the symptom onset till the diagnosis of tuberculosis

5.13.9 Treatment delay:

The time interval between the diagnosis of tuberculosis and the initiation of anti-tuberculous treatment. The total delay is also defined as the sum of patient delay and health care system delay. They are as follows.

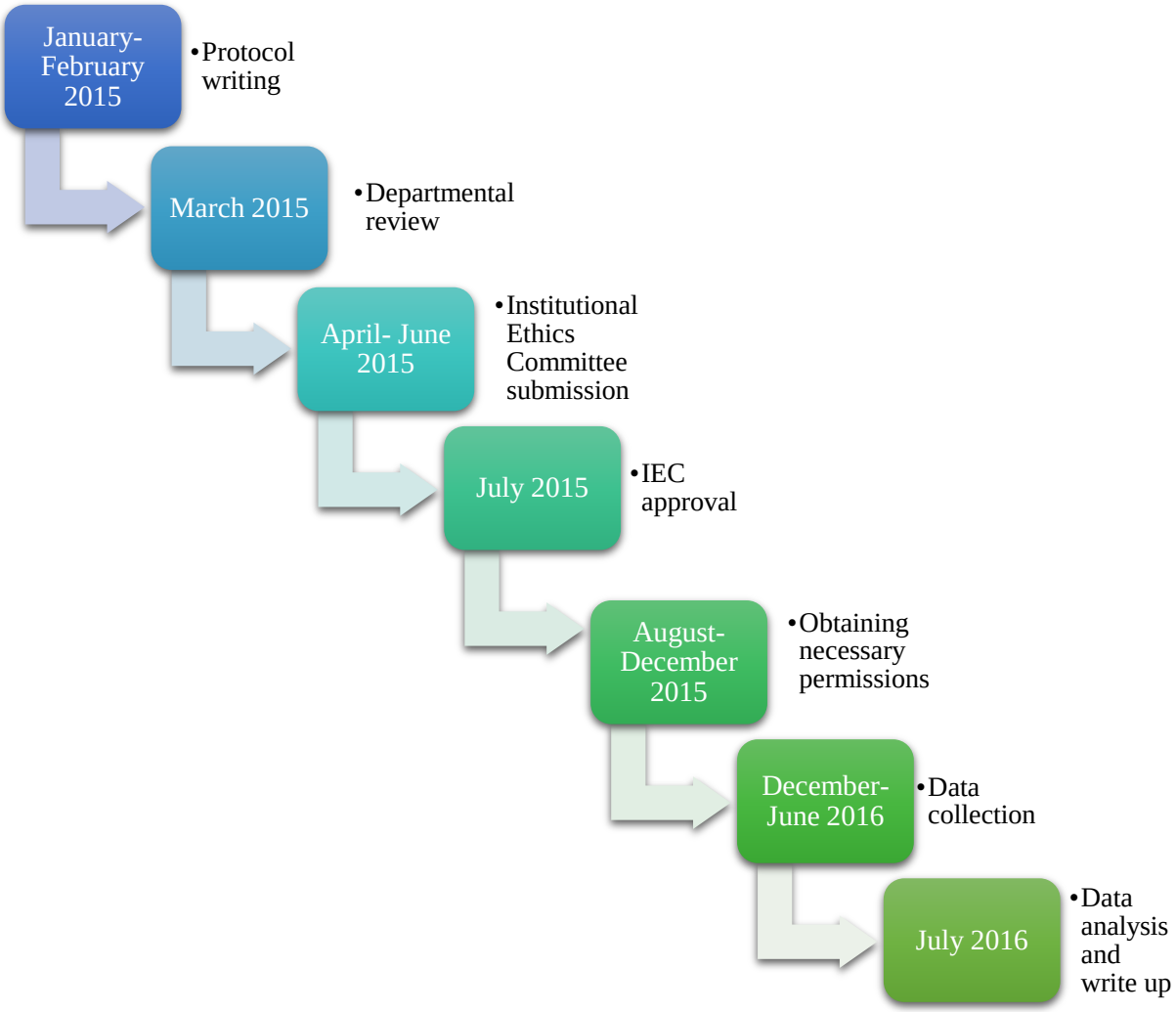
5.13.10 Patient delay:

The time interval between symptom onset and the presentation to a health care provider.

5.13.11 Health care system delay:

The time interval between the date at which the patient seeks a health care provider and the initiation of anti-tuberculous treatment.

5.14 Timeline:



5.15 Data management & statistical analysis:

The data thus collected is entered in Microsoft Excel and analysed using the trial version of Statistical Package for Social Sciences version 22.

5.15.1 Descriptive statistics:

The numerical variables are expressed in means and categorical variables as percentages. Since means are sensitive to outliers, medians with interquartile ranges are presented in addition to means.

The scores for stigma, knowledge and satisfaction with care are reversed before addition to their respective domains. Hence high scores for knowledge and satisfaction with care indicate high levels of knowledge & satisfaction respectively while high score for stigma indicates high levels of stigma relating to tuberculosis.

The delays in the diagnosis and treatment of tuberculosis are presented as mean duration days with 95% confidence intervals as well as median with interquartile ranges.

5.15.2 Inferential Statistics:

The mean scores for stigma on TB are compared across independent variables (gender, delay) using independent samples t test. The mean differences with 95% confidence intervals are estimated. The proportion of people providing the correct answers on knowledge regarding TB are compared across independent variables using Chi- square test. P value of

<0.05 is taken as statistically significant. Patients' satisfaction with care offered at the health facilities are compared across gender and delay using Mann Whitney U test, since the responses are not normally distributed and hence non-parametric tests are to be applied.

The median value for each type of delay is used as the cut-off value in order to transform the numerical variable into a dichotomous categorical variable. Bivariate analysis is performed to assess the relationship between each of the independent variable and the dependent variable (delay). Significant predictor variables are thus identified using bivariate analysis. Multiple logistic regression is then performed by including the significant predictor variables in the model for determining the relationship between the predictor variables and the outcome variable. The adjusted odds ratios (prevalence odds) is given with 95% Confidence intervals.

6. RESULTS

6.1 The socio demographic profile of the study participants is mentioned in table 2.

Table 2. Socio demographics

Characteristics	**Mean ± SD, n(%)**
Age (yrs)	43.23±12.52
Gender	
Men	122(61.9)
Women	75(38.1)
Education	
College/higher secondary	74(37.6)
Primary/middle/high school	87(44.2)
Illiterate	36(18.3)
Occupation	
Skilled	32(16.2)
Semi-skilled	74(37.6)
Student	36(18.3)
Unemployed/home maker	8(4.1)
Socio-economic status	
Upper middle	59(29.9)
Lower middle	91(46.2)
Upper lower	31(15.7)
Lower	16(8.1)

Table 2. Socio demographics (continued)

Characteristics	Mean ± SD, n(%)
Marital status	
Married	161(81.7)
Single	16(8.1)
Divorced/separated	8(4.1)
Widowed	12(6.1)
Financial status	
Savings	24(12.2)
Income=expenses	134(68)
In debt	39(19.8)
Residence	
Urban	142(72.1)
Urban slum	55(27.9)

From table 2, it is shown that the mean age of the study participants was 43.52 years, ranging from 18 to 70 years. Roughly two-thirds of them were men (61.9%).

Most of the study participants had done their schooling - primary/middle or high school (44.2%) Comparatively lesser proportion of the people were illiterate 18.3%. This in contrast with the study conducted by WHO in the Eastern Mediterranean region where 34.6% to 75.2% of the participants were illiterate.

With regard to occupational status, 37.6% of the study participants were semi-skilled employees, 16.2% were skilled employees, 18.3% were students, while only 4.1% were unemployed or home makers in case of women. While in the WHO study of 2006[12], majority (43%) of the study participants were unemployed or home makers.

Most of the study participants were married, (81.7%) while a very less proportion of them were single, divorced/separated or widowed. The proportion of married individuals is greater than the WHO 2006 study[12], where the proportion of married and single individuals were almost equal in the participant countries.

A majority of the study participants reported that their income was just adequate to meet the general expenditure. One-fifth (19.8%) reported being in debt and the rest had savings. Thus in a majority, the cost incurred due to illness would be an additional financial burden on their family.

Around one-fourth (27.9%) of the participants were from urban slums and the rest from urban areas.

Substance abuse & contact history:

The details of substance abuse and contact history are given in table 3. This study had a higher proportion of non-smokers (56.9%) than smokers (33.5%). A lesser proportion (9.6%) had quit smoking since more than a year. The median duration of smoking was 15.5 years, ranging from 2 to 40

years. The median daily consumption of cigarettes was 5, ranging from 2 to 20.

Alcohol consumption was reported by 23.9% of the study participants. Around one-fifth (22.3%) reported having been exposed to a known case of tuberculosis.

Table 3. Substance abuse and Contact history

Variables	**n(%)**
Smoking	
Never	112(56.9)
Current	66(33.5)
Ex-smoking	19(9.6)
Daily consumption of cigarettes	
Median(IQR)	5(3- 5)
Range	2- 20
Smoking duration in years	
Median(IQR)	15.5(10- 20.75)
Range	2 - 40
Alcohol	47(23.9)
Known exposure to TB patient	44(22.3)

Co-morbidities:

Around 66.5% of the study participants had various co-morbidities. The common co-morbid illnesses are listed in table 4. Hence in addition to anti-tuberculous treatment, factors such as management of co-morbid illnesses and drug interactions also play a role.

Table 4. Comorbidities in tuberculosis patients (N=131)

Co-morbidity	**n(%)**
Diabetes	71(36)
Hypertension	52(26.4)
COPD	8(4.1)

6.2 Patient related factors:

6.2.1 Symptoms & their duration

The details and duration of the symptoms which prompted the patients to seek health care are mentioned in table 5. Among the study participants, 72.1% had cough symptoms. The mean duration of cough was 38.25 days. Haemoptysis was present in 31.5% of the participants, with a mean duration of 8.36 days. Other less frequently complained symptoms were chest pain (22.3%), fever (9.6%) and loss of weight (5.6%).

Table 5. Symptoms and duration

Symptoms	n(%)	Mean ± SD (days)	Median(IQR)
Cough	142(72.1)	38.25±21.38	30(21-45)
Fever	19(9.6)	10.8±3.66	10(7-14)
Loss of weight	11(5.6)	1.77±1.09	2(1-2)
Haemoptysis	62(31.5)	8.36± 3.74	7(5-10)
Chest pain	44(22.3)	5.16±2.55	5(3-7)

Reasons for delay in seeking health care

Patients were asked regarding their reasons for delay in seeking care for their symptoms. The perceived reasons for delay in seeking care are mentioned in table 6. Some of the reasons stated were, being afraid of what would be found on diagnosis (3.7%), hoping the symptoms would go away on their own (46.7%), economic constraints (13.7%) & inconvenient timings(19.8%).

Table 6. Perceived reasons for delay

Reasons	n(%)
Fear of what would be found on diagnosis	27(3.7)
Hoped their symptoms would go away on their own	92(46.7)
Economic constraints	27(13.7)
Work timings	39(19.8)

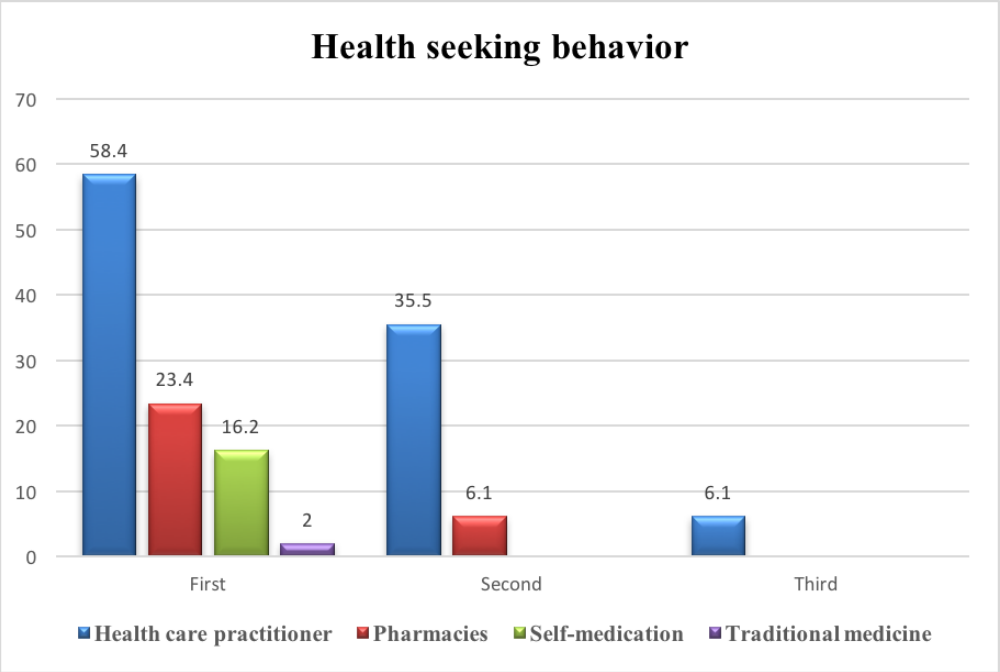
6.2.2 Health seeking patterns for symptoms:

The health seeking behaviour of the study participants is mentioned in table 7. Almost two-thirds of the patients sought health care providers for their symptoms. Next to health care providers, 23.4% of the patients sought pharmacies for treatment. Participants reported using over the counter medications due to reasons such as easy accessibility and availability. Other patients reported self-medication (16.2%) using drugs that were already present at home, due to prescription for some previous illness etc. If their symptoms were not relieved by measures such as over the counter medication & self-medication, the patients reported seeking a health care provider as the next point of contact for their symptom relief.

Table 7. Health seeking behaviour with the onset of illness

Health seeking behaviour	**n(%)**
First action	
Health care provider	115(58.4)
Self-medication	32(16.2)
Drug stores/pharmacies	46(23.4)
Traditional medicine	4(2.0)

Figure 1. Pattern of health seeking behaviour



6.2.3 Knowledge and Stigma regarding tuberculosis:

Knowledge on tuberculosis was measured using questions such as 'is TB hereditary, contagious, curable, duration of treatment' etc. The proportion of individuals who provide the correct answers are compared across genders using Chi square test.

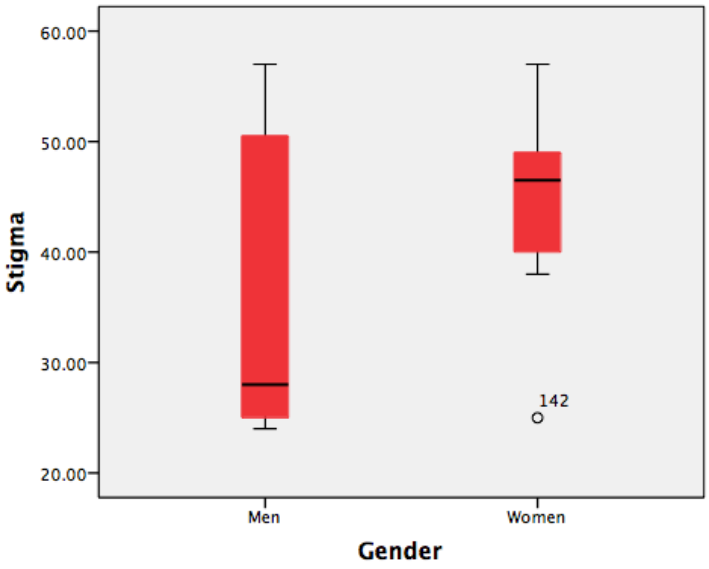
The questions & percentages of correct responses on knowledge regarding TB are given in table 8. The responses are compared across genders using Chi square test. As shown in the table, there is not much significant difference across genders on knowledge regarding tuberculosis. One of the points to be noted is that, all participants were aware of the fact that tuberculosis was a curable disease.

Table 8. Patients' knowledge about tuberculosis

Questions	Men	Women	Chi square statistic	df	p value
What kind of a disease do you have?	103(64.4)	57(35.6)	2.162	1	0.141
Is TB hereditary?	115(63.2)	67(36.8)	1.604	1	0.21
Is TB contagious?	77(63.6)	44(36.4))	0.388	1	0.533
Is TB curable?	122(61.9)	75(38.1)			
Duration of ATT	101(73.2)	37(26.8)	24.77	1	<0.01

Stigma regarding tuberculosis was assessed using the following: feeling ashamed of having TB, having to hide the diagnosis of TB from others, the extent to which tuberculosis affects their work performance, family life, relation with others, if a girl is unable to decide getting treated for TB etc. The mean scores on stigma are compared across genders using independent samples t test. As shown in figure 2, women seem to have a significantly higher levels of stigma than men.

Figure 2. Mean scores – stigma



The sources from which patients obtained the information on tuberculosis are given in table 9. Friends and relatives are the main sources of information of tuberculosis (32.5%) among the study participants. A family member or relative being diagnosed with tuberculosis (12.2%)was also a source of information among some other. The rest of the participants mentioned media (19.3%) and educational institutions (19.3%) as the source of information on tuberculosis.

Table 9. Source of information on tuberculosis

Source	**n(%)**
Govt. campaigns/media	38(19.3)
Educational institutions	24(12.2)
Friends/relatives	64(32.5)
Tuberculosis patients	24(12.2)

6.3 Health system related variables

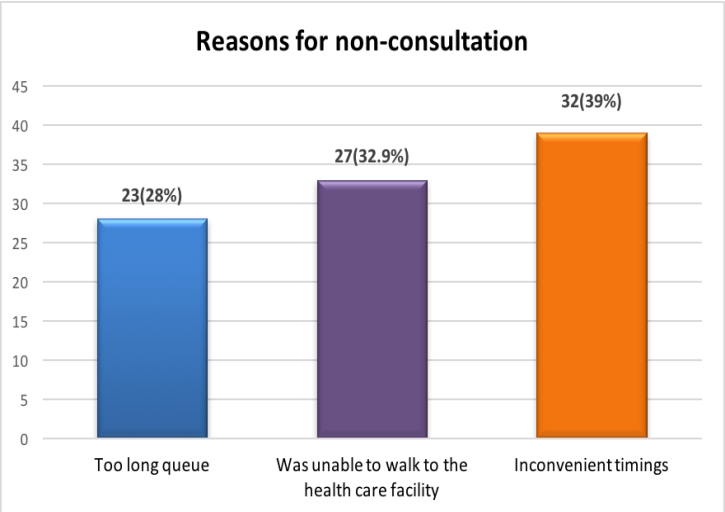
The health system related variables include reasons for not consulting the health care facility as the first point of contact, satisfaction with care, number of visits needed to reach the diagnosis and time taken to reach the health facility.

6.3.1 Reasons for non-consultation with the health care facility

Among the study participants, 58.4% had sought a health care provider as the first point of contact for their symptoms. The remaining participants (41.6%) who had not sought a health care provider first for their symptoms, were asked regarding the reasons for the same. The responses are given in Figure 3.

As shown in Figure 3, Inconvenient timings was one of the major reasons given by the participants (39%). The other reasons were inability to walk to the health care facility (32.9%) and long waiting queues (28%).

Figure 3. Reasons for non-consultation



6.3.2 Satisfaction with care:

Satisfaction with the care offered by the health care providers was measured on a Likert scale. The various questions used to assess patients' level of satisfaction with care are mentioned in Table 10 along with the statistical significance obtained using Mann Whitney U test. There was not much significant difference in satisfaction with care between men and women.

Table 10. Satisfaction with care-comparison across genders

Variable	**p value**
Availability of services	<0.01
Prompt action from Health care provider	0.09
Well equipped facility	0.04*
Free medicines	0.01*
Accessibility	0.55
Optimal workload	0.52
Waiting time	0.92

Proportion of patients missed at their first visit

As shown in table 11, 64.5% had been diagnosed at their first contact with a health care provider. Only 35.5% of the patients were missed. This is a much lower than the study by Ananthakrishnan R et al[59] where 69.4% of the patients had missed being diagnosed at their first visit with the health care facility

Table 11. Proportion of patients diagnosed at first visit.

	Frequency	**Percent**
Diagnosed	127	64.5
Missed	70	35.5
Total	197	100

6.3.3 Number of visits before reaching the diagnosis:

Among the study participants, more than one health care provider was sought at times, before they were diagnosed with TB. During their visit to the health care provider who made the diagnosis, they required more than one visit at times. As shown in table 12, 43.7% had been diagnosed at their first visit, and by the end of the second visit, 98% of the patients had been diagnosed. Only 2% were diagnosed at their third visit.

Table 12. Number of visits before reaching the diagnosis

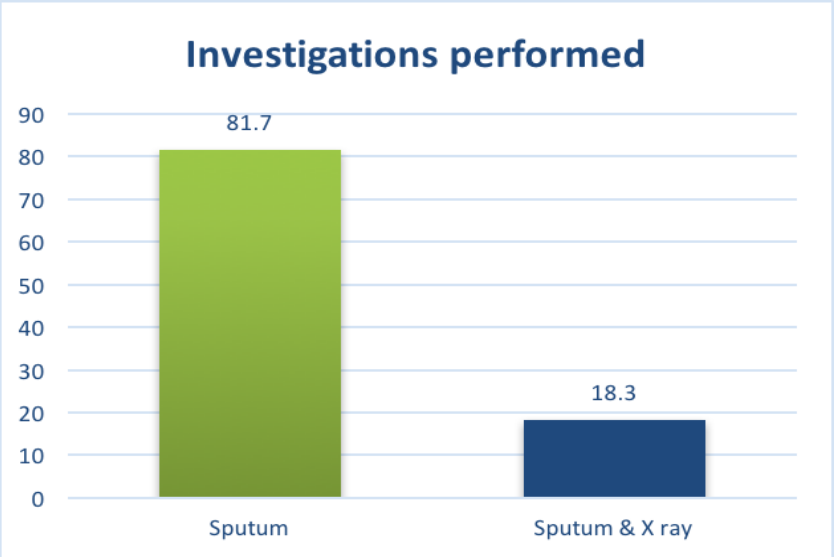
No. of visits	n(%)	Cumulative %
1	86(43.7)	43.7
2	107(54.3)	98
3	4(2)	100

The health facilities which made the diagnosis are mentioned in table 13. The health care facilities visited by the people were either the nearby TB centre which performs sputum microscopy, or the Urban Primary health centre or a private clinic/hospital. A majority of the patients were diagnosed at the TB centres (57.9%) or primary health centres(32%), while a lesser proportion were diagnosed at private clinics or hospitals (10.2%) and then referred to the DOTS centres for management.

Table 13. Health facility which made the diagnosis

Health facility	n(%)
TB Centre	114(57.9)
Primary health centre	63(32)
Private clinic/hospital	20(10.2)

Figure 4. Investigations performed for diagnosis



The investigations performed at health facilities for diagnosing TB are provided in Figure 4. Among the study participants, 161 (81.7%) had been diagnosed by Sputum microscopy, and the remaining 36 (18.3%) had been prescribed both chest radiography and sputum microscopy for diagnosis of tuberculosis.

6.3.4 Time taken to reach the nearest health facility

As shown in table 14, 74.1 % of the study participants reported that they were able to reach the nearest health facility in less than or equal to 15 minutes. The rest, reported that it took them around 16 to 30 minutes to reach the nearby health facility. The longer time in this study was more due to the fact that walking was the predominant method of transport to the nearby health facility than vehicles.

Table 14. Time taken to reach the health facility

Time taken	n(%)
<15 min	146(74.1)
16-30 min	51(25.9)

6.4 Delays in the diagnosis and treatment of tuberculosis

The delays in the diagnosis and treatment of tuberculosis have been measured as per the operational definitions. The mean delay in days with 95% confidence intervals and the median duration with interquartile ranges have been presented in Table 15.

Table 15. Delays in the diagnosis and treatment of tuberculosis

Delay (days)	Mean	95% C.I		Median	Interquartile range
		Lower	Upper		
Patient delay	42	38.69	45.31	35	25-50
Health system delay	4.72	4.41	5.03	4	3- 6
Diagnosis delay	42.82	39.38	46.26	36	25 - 51
Treatment delay	3.9	3.67	4.13	3	3 - 5
Total delay	46.72	43.29	50.15	39	28- 55

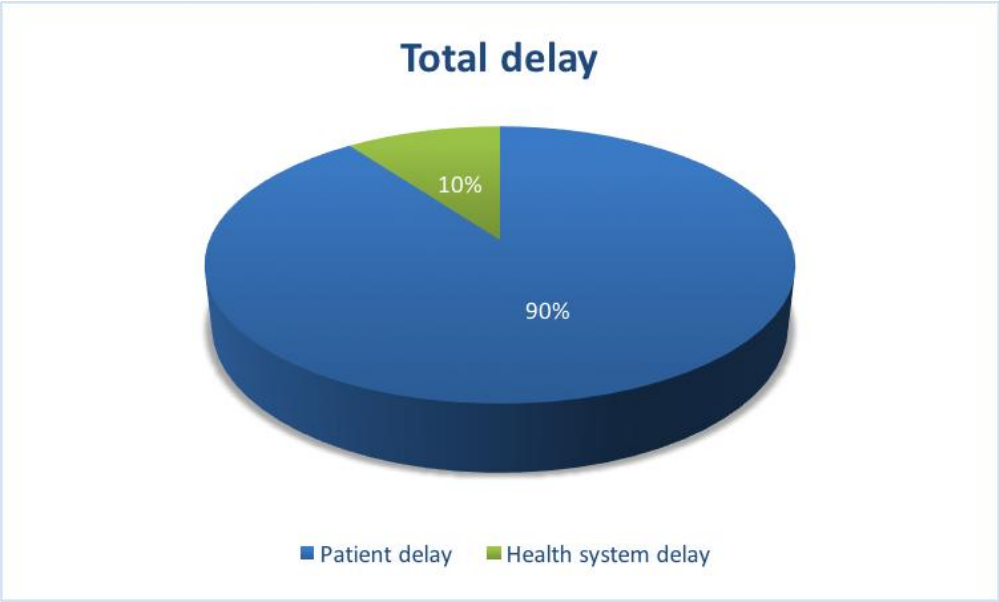
6.4.1 Patient delay:

Despite the fact that any cough more than 2 weeks' duration necessitates a visit to the health care provider, there has been a mean delay of 42 days, from the onset of symptoms till the diagnosis. This means, even after having cough symptoms for two weeks, the patients delay for 28 days more on an average before visiting a health care provider. The median duration is 35 days, which is a week lesser than the mean duration.

6.4.2 Health system delay:

The mean duration of health system delay is much shorter, at 4.72 days, from the patient's presentation to the health care provider till the diagnosis is made. The median duration is approximately equal to the mean, at 4 days.

Figure 5. Relative proportions of patient & health system delay



As shown in figure 5, patient delay is the major contributor to the total delay in diagnosis and treatment of tuberculosis patients. The health system delay contributes to merely 10% of the total delay.

6.4.3 Diagnosis delay:

A greater proportion of the diagnosis delay is the patient delay. The mean diagnostic delay is 42.82 days, while the mean is slightly lesser at 36 days.

6.4.4 Treatment delay:

There is a far shorter delay from the diagnosis till the initiation of treatment. The mean treatment delay is 3.9 days, while the median duration is 3 days. Hence, in this study, once the patients are diagnosed after presenting to a health care facility, the treatment is initiated within a few days.

6.4.5 Total delay:

Similar to diagnostic delay, the predominant component of total delay is the patient delay. The mean total delay is 46.72 days, with 95% Confidence Interval ranging from 43.29 to 50.15 days. Hence from the onset of symptoms till the diagnosis and initiation of treatment, there is an average delay of 46.72 days, and a median delay of 39 days.

6.5 Factors associated with delay:

6.5.1 Patient related factors:

Bivariate analysis is performed with each of the predictor variable to find out the significantly associated factors. The results are summarized in table 15. Total delay was classified according to the median cut off as <39 days (longer delay) and ≥39 days. The individual variables were cross tabulated against the outcome variable. The unadjusted odds ratios are expressed along with 95% confidence intervals. Then, the significant predictor variables are included in the multivariate analysis. Multiple logistic regression is performed next and adjusted odds ratios are calculated along with 95% confidence intervals.

In bivariate analysis, among the predictor variables, age >35 years, smokers, first point of contact being other than health care providers are associated with increased odds of delay. Women, compared to men have a lesser odds of delay.

Table 16. Patient related factors

Predictor variables	Delayed (%)	Crude odds ratio (95% C.I)	Adjusted Odds ratio (95% C.I)
Age			
<35 years*	15(28.3)	3.867 (1.95, 7.668)	5.044 (2.143, 11.873)
≥35 years	87(60.4)		
Gender			
Men*	71(58.2)	0.506 (0.282, 0.907)	0.713 (0.278, 1.830)
Women	31(41.3)		
Education			
Literate*	78(48.4)	2.128 (0.997, 4.545)	
Illiterate	24(66.7)		
Occupation			
Employed*	79(52.7)	0.861 (0.447, 1.659)	
Unemployed	23(48.9)		
Financial status			
Not in debt*	83(52.5)	0.858 (0.426, 1.731)	
In debt	19(48.7)		
Residence			
Urban*	79(55.6)	0.573 (0.305, 1.076)	
Urban slum	23(41.8)		
Marital status			
Married*	78(48.4)	2.128 (0.997, 4.545)	
Single/Others	24(66.7)		
Smoking status			
Non-smoker*	39(34.8)	5.36 (2.878, 9.983)	8.622 (3.275, 22.697)
Current/ex-smoker	63(74.1)		
Health seeking behaviour			
Health care provider*	40(34.8)	5.813(3.085, 10.952)	5.096 (2.497, 10.401)
Others	62(75.6)		
			Constant 0.084

***** - reference category

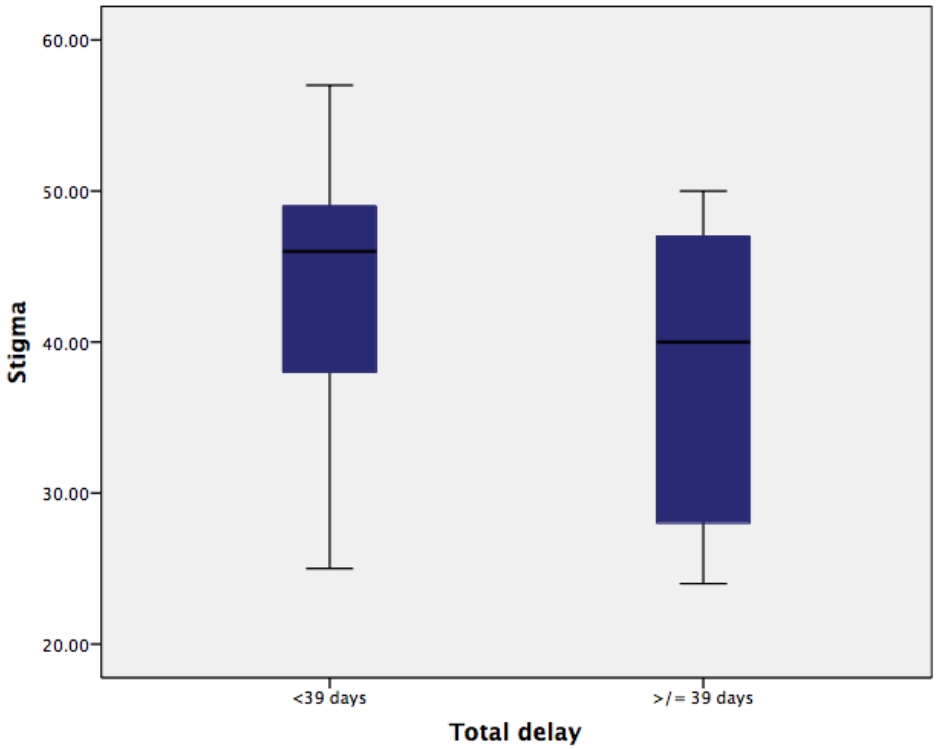
Table 17. Knowledge and delay

Questions	<39 days	≥39 days	Chi square statistic	df	p value
What kind of a disease do you have	84(52.5)	76(47.5)	6.24	1	<0.01*
Is TB hereditary?	85(46.7)	97(53.3)	2.21	1	0.14
Is TB contagious?	56(46.3))	65(53.7)	0.474		0.49
Is TB curable?	95(48.2)	102(51.8)			
Duration of anti-tuberculous treatment	60(43.5)	78(56.5)	4.155	1	0.04*

As shown in table 17, the knowledge on tuberculosis is compared across the two categories of delay using chi-square test. Over all, there is not much difference in the knowledge on tuberculosis compared across those who had a prolonged delay of seeking care and those who sought care relatively earlier.

The mean scores on stigma are compared across the two categories of delay and the results are summarized in figure 6. Though the level of stigma among those with prolonged delay seems to be lower, the statistical significance is almost closer to 0.05

Figure 6. Stigma and delay



6.6 Health care system related factors:

As shown in tables 18 and 19, neither the time taken to reach the health facility nor the patients' satisfaction with care are significantly associated with prolonged delays.

Table 18 Time to reach health facility and delay

Predictor variable	**Crude Odds ratio**	**95% Confidence interval**	
		Lower	**Upper**
Time taken to reach health facility <15 min* >15 min	0.841	0.444	1.593

Table 19 Satisfaction with care and delay

Variable	p value
Availability of services	0.62
Prompt action from Health care provider	0.3
Well equipped facility	<0.01*
Free medicines	0.86
Accessibility	0.6
Optimal workload	0.49
Waiting time	0.056

6.7 Multivariate analysis of factors associated with total delay:

The predictors identified in the bivariate analysis were included in the multivariate analysis. Results show that after adjusting for other factors, gender is not significantly associated with delay in tuberculosis patients. The remaining factors still remain significant. In particular, smoking status is associated with an increased odds of delay in pulmonary tuberculosis patients.

Comparing the results of the bivariate and multivariate analysis, it is inferred that smoking has been a confounding factor. Most of the smokers are men, and smoking is significantly associated with longer delay in

seeking health care. Hence, gender, which was a significant predictor variable in the bivariate analysis, is not statistically significant in the multivariate analysis after adjusting for smoking. To summarize, patient delay was the major contributor to the total delay in the diagnosis and treatment of tuberculosis. Age >35 years, smoking and not seeking a health care provider as the first point of contact were the significant factors associated with the total delay. The association remained significant even after adjusting for other factors.

7. DISCUSSION

The findings of this study indicate that patients had symptoms of cough for a mean duration of 38.25 days & loss of weight for 1-2 months. While the cough symptoms and loss of weight did not prompt the patients to seek medical care earlier, other more acute symptoms such as haemoptysis & chest pain made patients seek health care relatively earlier.

7.1 Health seeking behaviour:

Among the study participants, 58.4% reported seeking a health care provider for their symptoms. This is in contrast to previous studies, where the proportion of patients seeking a health care provider as the first point of contact are 23%[32] and 13.3%[35.] Next to health care providers, purchasing over the counter medication (23.4%) was the first action undertaken for symptom relief. Similar to some other studies[57,60,62], self-medication and traditional medicine to a lesser extent have also been the initial course of action for the symptoms.

7.2 Knowledge and Stigma:

Women had a higher level of stigma than men. This is in contrast to the WHO 2006 study[12], where women had a higher knowledge on tuberculosis than men. There were not much gender differences in stigma regarding to tuberculosis across most countries.

There was not much association between stigma levels and delay in seeking care. This is contrast with the studies by Mesfin et al[39], Biya et al[40],

& Osei et al[66]. In this study, knowledge was not significantly associated with delay, unlike some other studies[39,40,57].

7.3 Health system delay:

The other component of delay is the health system delay. Among the participants who did not seek a health care facility first for their symptoms, 39% mentioned inconvenient timings as the major reason. They were unable to take a day off or avail permission from their workplace to consult a health care provider. This finding is in accordance with the study by Ghosh et al[41]. In case of older women, difficulty in walking to the health care facility was stated as one of the major reasons. In both genders, waiting times was an additional reason for not consulting a health care facility. Similar to this study, Ukwaja et al[44] reported longer walking distances and waiting times to be associated with delay.

In the event of consulting a health care provider, both men and women were satisfied with the quality of care provided there. There was no significant difference in the satisfaction with health care between patients who had sought care earlier and those who delayed. In contrast, the study by Charles N et al[37], dissatisfaction with the facility was one of the major reasons for not seeking health care.

In the event of seeking health care provider, 35.5% of the patients missed being diagnosed at their first visit to the health care facility. In the study by Ananthakrishnan R et al[59], 69.4% were missed at the first visit. The

data for that study was collected during 2007. This indicates that over the years, the proportion of patients who are missed being diagnosed has declined considerably.

7.4 Delays in diagnosis & treatment:

In this study, there is a mean patient delay of 42 days and a median delay of 35 days. This finding is higher than in other studies, where the median delay is usually lesser than three weeks[37,49,50,51,53,60,62,59]. Hamza et al[65], has reported a median patient delay of 30 days, which is closer to the findings of this study. Other studies by Basnet et al[58] and Osey et al[66], report longer median patient delays i.e 50 days & 59 days respectively.

The median health system delay is 4 days, which is lesser than the values reported by most other studies[49,50,53,58,62,66]. The median total delay in this study is 39 days, which is similar to the study by Hamza et al[65] which reports a median delay of 40 days. Other studies such as Ukwaja et al[44], Lawn et al[46], Rajeswari et al[49], Odusanya et al[51], Kiwuwa et al[52], Basnet et al[58], Belay et al[62], Osey et al[66] report a much longer total delay. Overall, the median patient delay in this study is longer than most other studies, while the health system delay and total delay is lesser.

7.5 Factors associated with delays:

The significant factors associated with total delay in this study were age $\geq$35 years, smoking, stigma and not consulting a health care provider as the first point of contact. Older age groups were significantly associated with

delay in the studies by Ukwaja et al[44], Godfrey-Faussett et al[48], Storla et al[57] & Ngangro et al[61].

Gender was associated with longer delays in some studies[12,48], in contrast, gender was not significantly associated with delay in this study, after adjusting for other factors.

Smoking was strongly associated with longer patient delays in this study. Compared to non-smokers, current or ex-smokers have 8.622 times the odds of longer delays. The 95% Confidence interval ranges from 3.275 to 22.697. Smoking is significantly associated with delays in some other studies as well[50,52,57,58]. In this study, smokers reported that they tended to perceive cough symptoms as due to smoking and hence delay seeking health care. This might be a contributing factor to prolonged patient delay in smokers.

Health care provider related factors such as time to reach health facility and timings were significant factors in other studies[12,44,49,50] but were not significantly associated with increased total delay in this study. The probable reason might be that this study setting is an urban area and the time taken to reach health care facilities was less than 30 minutes. Hence, though some participants reported difficulty in walking to health care facilities, it was not significantly associated with delay in getting diagnosed and treated.

8. CONCLUSION

In conclusion, this study demonstrates that patient delay is the major contributor to the total delay in the diagnosis and treatment of pulmonary tuberculosis patients. Despite the current recommendations stating that cough > 2 weeks necessitates consulting a health care facility, majority of the chest symptomatics still delay seeking health care. Most of them seek health care only with the onset of acute symptoms such as chest pain and haemoptysis. Factors such as easy availability of over the counter medications add to the delay. Due to temporary relief of cough symptoms, patients delay seeking health care still longer. In addition, though patients are aware that tuberculosis is a curable illness, the element of stigma attached to it remains still. This in turn, to some extent, contributes to delay in seeking care.

One of the high focus groups which has been identified in this study are smokers who currently smoke or have quit smoking. Despite the wide confidence interval, there is an increased odds of delay among smokers when compared to people who have never smoked. Thus, in addition to passive smoking, people are exposed to an increased risk of acquiring the infection from smokers who have TB.

To conclude, there is an unacceptable delay on the part of the TB patients in seeking health care. Such gaps need to be addressed if the case detection rates are to be improved.

9. RECOMMENDATIONS

At present, individuals who are HIV positive, diabetics, and contacts of known TB cases etc. are at an increased suspicion for TB when they experience chest symptoms. Activities such as health education, 'fast tracking' i.e early referral in case of chest symptoms improve the case detection rates in such groups. As per the findings of this study, smokers may also be included in such targeted efforts. In addition to anti-smoking campaigns, smokers may be made aware of the importance of seeking health care in case of chest symptoms. Further, reduction in over the counter supply of drugs through stringent monitoring may also be undertaken as an additional activity to facilitate earlier health care seeking by chest symptomatics. Such measures which reduce the patient delay are expected to improve the case detection rates, thus helping to further the efforts towards achieving 'End TB'.

10. LIMITATIONS

Recall bias could have been a limiting factor in eliciting history pertaining to the onset and duration of symptoms, though measures such as inclusion of patient on intensive phase of Category I ATT, usage of a local calendar, listing out important events/days such as religious festivals, national holidays were undertaken to estimate the dates and duration of symptoms.

Despite such limitations, this study is expected to provide a certain amount of baseline information regarding the delays in diagnosing and treating tuberculosis. Since this study was conducted in an urban population, future studies can be conducted in rural populations to estimate the delay and factors contributing to delay. If the recommendations are implemented, further studies can be undertaken to study the impact.

BIBLIOGRAPHY

1. History of tuberculosis. In: Wikipedia, the free encyclopedia [Internet]. 2016 [cited 2016 Sep 22]. Available from: https://en.wikipedia.org/w/index.php?title=History_of_tuberculosis&oldid=738924009.
2. K P. Park's textbook of preventive and social medicine. 23rd ed. Bhanot; 176 p.
3. WHO | Tuberculosis [Internet]. WHO. [cited 2016 Sep 22]. Available from: http://www.who.int/mediacentre/factsheets/fs104/en/.
4. WHO | Systematic screening for active tuberculosis: an operational guide [Internet]. WHO. [cited 2016 Sep 22]. Available from: http://www.who.int/tb/publications/systematic_screening/en/
5. Technical and operational guidelines for tuberculosis control in India [Internet]. [cited 2016 Sep 22]. Available from: http://www.tbcindia.nic.in/
6. WHO | Global tuberculosis report 2015 [Internet]. WHO. [cited 2016 Sep 22]. Available from: http://www.who.int/tb/publications/global_report/en/
7. Universal Immunization Programme (UIP) | National Health Portal Of India [Internet]. [cited 2016 Sep 22]. Available from: http://www.nhp.gov.in/universal-immunization-programme-uip_pg

8. World Health Organization. Treatment of tuberculosis: guidelines for national programs. Geneva, Switzerland: World Health Organization; 2003 (WHO/CDS/TB/2003.313)
9. WHO | The Stop TB Strategy [Internet]. WHO. [cited 2016 Sep 22]. Available from: http://www.who.int/tb/strategy/stop_tb_strategy/en/
10. WHO | The End TB Strategy [Internet]. WHO. [cited 2016 Sep 22]. Available from: http://www.who.int/tb/strategy/end-tb/en/
11. WHO | 10 facts about tuberculosis [Internet]. WHO. [cited 2016 Sep 22]. Available from: http://www.who.int/features/factfiles/tuberculosis/en/
12. Diagnostic and treatment delay in tuberculosis [Internet]. WHO; 2006. Available from: http://applications.emro.who.int/dsaf/dsa710.pdf.
13. Borgdorff MW. New measurable indicator for tuberculosis case detection. Emerging Infectious Diseases. 2004;10(9):1523–8.
14. Dye C, Garnett GP, Sleeman K, Williams BG. Prospects for worldwide tuberculosis control under the WHO DOTS strategy. The Lancet. 352(9144):1886–91.
15. Netto EM, Dye C, Raviglione MC. Progress in global tuberculosis control 1995-1996, with emphasis on 22 high-incidence countries. Global Monitoring and Surveillance Project. Int J Tuberc Lung Dis. 1999 Apr;3(4):310–20.

.

16. Dye C, Watt CJ, Bleed DM, Williams BG. What is the limit to case detection under the DOTS strategy for tuberculosis control? Tuberculosis. 83(1):35–43.
17. Sánchez-Pérez HJ, Hernán MA, Hernández-Díaz S, Jansá JM, Halperin D, Ascherio A. Detection of pulmonary tuberculosis in Chiapas, Mexico. Ann Epidemiol. 2002 Apr;12(3):166–72.
18. Dye C, Watt CJ, Bleed DM, Hosseini SM, Raviglione MC. Evolution of tuberculosis control and prospects for reducing tuberculosis incidence, prevalence, and deaths globally. JAMA. 2005 Jun 8;293(22):2767–75.
19. Narayanan PR, Garg R, Santha T, Kumaran PP. Shifting the focus of tuberculosis research in India. Tuberculosis (Edinb). 2003;83(1–3):135–42.
20. Becerra MC, Pachao-Torreblanca IF, Bayona J, Celi R, Shin SS, Kim JY, et al. Expanding tuberculosis case detection by screening household contacts. Public Health Rep. 2005;120(3):271–7.
21. Golub JE, Mohan CI, Comstock GW, Chaisson RE. Active case finding of tuberculosis: historical perspective and future prospects [Review Article]. The International Journal of Tuberculosis and Lung Disease. 2005 Nov 1;9(11):1183–203.
22. Heller RF, Gemmell I, Edwards R, Buchan I, Awasthi S, Volmink JA. Prioritising between direct observation of therapy and case-

finding interventions for tuberculosis: use of population impact measures. BMC Medicine. 2006;4:35.

23. Yimer S, Holm-Hansen C, Yimaldu T, Bjune G. Evaluating an active case-finding strategy to identify smear-positive tuberculosis in rural Ethiopia. Int J Tuberc Lung Dis. 2009 Nov;13(11):1399–404.
24. Bai LQ, Yang HL, Jian XW, He XG, Chen YF, Tang Y, et al. Increasing tuberculosis case detection through intensive referral and tracing in Hunan, China. Int J Tuberc Lung Dis. 2008 Dec;12(12):1431–5.
25. Wahyuni CU, Budiono null, Rahariyani LD, Sulistyowati M, Rachmawati T, Djuwari null, et al. Obstacles for optimal tuberculosis case detection in primary health centers (PHC) in Sidoarjo district, East Java, Indonesia. BMC Health Serv Res. 2007;7:135.
26. Datiko DG, Lindtjørn B. Health extension workers improve tuberculosis case detection and treatment success in southern Ethiopia: a community randomized trial. PLoS ONE. 2009;4(5):e5443.
27. Colvin C, Mugyabuso J, Munuo G, Lyimo J, Oren E, Mkomwa Z, et al. Evaluation of community-based interventions to improve TB case detection in a rural district of Tanzania. Glob Health Sci Pract. 2014 May 13;2(2):219–25.

28. Sekandi JN, Neuhauser D, Smyth K, Whalen CC. Active case finding of undetected tuberculosis among chronic coughers in a slum setting in Kampala, Uganda. Int J Tuberc Lung Dis. 2009 Apr;13(4):508–13.
29. Okuonghae D. Determinants of TB case detection in Nigeria: A survey. gjhs. 2010 Oct;2(2):123–8.
30. van't Hoog AH, Marston BJ, Ayisi JG, Agaya JA, Muhenje O, Odeny LO, et al. Risk Factors for Inadequate TB Case Finding in Rural Western Kenya: A Comparison of Actively and Passively Identified TB Patients. PLoS One [Internet]. 2013 Apr 25 [cited 2016 Sep 6];8(4). Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3636249/
31. Lukudu DL. Pulmonary tuberculosis case detection in South Sudan [Internet]. South Sudan Medical Journal. [cited 2016 Sep 22]. Available from: http://www.southsudanmedicaljournal.com/archive/november-2012/pulmonary-tuberculosis-case-detection-in-south-sudan.html.
32. Fochsen G, Deshpande K, Diwan V, Mishra A, Diwan VK, Thorson A. Health care seeking among individuals with cough and tuberculosis: a population-based study from rural India. Int J Tuberc Lung Dis. 2006 Sep;10(9):995–1000.

33. Kasse Y, Jasseh M, Corrah T, Donkor SA, Antonnio M, Jallow A, et al. Health seeking behaviour, health system experience and tuberculosis case finding in Gambians with cough. BMC Public Health. 2006 Jun 5;6:143.
34. Zhang T, Liu X, Bromley H, Tang S. Perceptions of tuberculosis and health seeking behaviour in rural Inner Mongolia, China. Health Policy. 2007 May;81(2–3):155–65.
35. Wang WB, Jiang QW, Chen Y, Xu B. Pathways from first health care seeking to diagnosis: obstacles to tuberculosis care in rural China. Int J Tuberc Lung Dis. 2007 Apr;11(4):386–91.
36. Rumman KA, Sabra NA, Bakri F, Seita A, Bassili A. Prevalence of tuberculosis suspects and their healthcare-seeking behavior in urban and rural Jordan. Am J Trop Med Hyg. 2008 Oct;79(4):545–51.
37. Charles N, Thomas B, Watson B, Sakthivel M. R, V. C, Wares F. Care Seeking Behavior of Chest Symptomatics: A Community Based Study Done in South India after the Implementation of the RNTCP. PLoS One [Internet]. 2010 Sep 20 [cited 2016 Sep 6];5(9). Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2942833/
38. Yimer S, Holm-Hansen C, Yimaldu T, Bjune G. Health care seeking among pulmonary tuberculosis suspects and patients in rural Ethiopia: a community-based study. BMC Public Health. 2009 Dec 9;9:454.

39. Mesfin MM, Newell JN, Walley JD, Gessessew A, Madeley RJ. Delayed consultation among pulmonary tuberculosis patients: a cross sectional study of 10 DOTS districts of Ethiopia. BMC Public Health. 2009 Feb 9;9:53.
40. Biya O, Gidado S, Abraham A, Waziri N, Nguku P, Nsubuga P, et al. Knowledge, care-seeking behavior, and factors associated with patient delay among newly-diagnosed pulmonary tuberculosis patients, Federal Capital Territory, Nigeria, 2010. Pan Afr Med J. 2014;18 Suppl 1:6.
41. Ghosh S, Sinhababu A, Taraphdar P, Mukhopadhyay DK, Mahapatra BS, Biswas AB. A study on care seeking behavior of chest symptomatics in a slum of Bankura, West Bengal. Indian J Public Health. 2010 Mar;54(1):42–4.
42. Satyanarayana S, Nair SA, Chadha SS, Sharma G, Yadav S, Mohanty S, et al. Health-care seeking among people with cough of 2 weeks or more in India. Is passive TB case finding sufficient? Public Health Action. 2012 Dec 21;2(4):157–61.
43. Hoa NB, Tiemersma EW, Sy DN, Nhung NV, Vree M, Borgdorff MW, et al. Health-seeking behaviour among adults with prolonged cough in Vietnam. Trop Med Int Health. 2011 Oct;16(10):1260–7.
44. Ukwaja KN, Alobu I, Nweke CO, Onyenwe EC. Healthcare-seeking behavior, treatment delays and its determinants among pulmonary

tuberculosis patients in rural Nigeria: a cross-sectional study. BMC Health Serv Res. 2013;13:25.

45. Engeda EH, Dachew BA, Kassa Woreta H, Mekonnen Kelkay M, Ashenafie TD. Health Seeking Behaviour and Associated Factors among Pulmonary Tuberculosis Suspects in Lay Armachiho District, Northwest Ethiopia: A Community-Based Study. Tuberc Res Treat [Internet]. 2016 [cited 2016 Sep 22];2016. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4789024/
46. Lawn SD, Afful B, Acheampong JW. Pulmonary tuberculosis: diagnostic delay in Ghanaian adults. The International Journal of Tuberculosis and Lung Disease. 1998 Aug 1;2(8):635–40.
47. Sreeramareddy CT, Panduru KV, Menten J, Van den Ende J. Time delays in diagnosis of pulmonary tuberculosis: a systematic review of literature. BMC Infectious Diseases. 2009;9:91.
48. Godfrey-Faussett P, Kaunda H, Kamanga J, van Beers S, van Cleeff M, Kumwenda-Phiri R, et al. Why do patients with a cough delay seeking care at Lusaka urban health centres? A health systems research approach. Int J Tuberc Lung Dis. 2002 Sep;6(9):796–805.
49. Rajeswari R, Chandrasekaran V, Suhadev M, Sivasubramaniam S, Sudha G, Renu G. Factors associated with patient and health system delays in the diagnosis of tuberculosis in South India. Int J Tuberc Lung Dis. 2002 Sep;6(9):789–95.

50. Selvam JM, Wares F, Perumal M, Gopi PG, Sudha G, Chandrasekaran V, et al. Health-seeking behaviour of new smear-positive TB patients under a DOTS programme in Tamil Nadu, India, 2003. Int J Tuberc Lung Dis. 2007 Feb;11(2):161–7.
51. Odusanya OO, Babafemi JO. Patterns of delays amongst pulmonary tuberculosis patients in Lagos, Nigeria. BMC Public Health. 2004 May 29;4:18.
52. Kiwuwa MS, Charles K, Harriet MK. Patient and health service delay in pulmonary tuberculosis patients attending a referral hospital: a cross-sectional study. BMC Public Health. 2005;5:122.
53. Tobgay KJ, Sarma PS, Thankappan KR. Predictors of treatment delays for tuberculosis in Sikkim. Natl Med J India. 2006 Apr;19(2):60–3.
54. Mfinanga SG, Mutayoba BK, Kahwa A, Kimaro G, Mtandu R, Ngadaya E, et al. The magnitude and factors associated with delays in management of smear positive tuberculosis in Dar es Salaam, Tanzania. BMC Health Serv Res. 2008;8:158.
55. Xu B, Diwan VK, Bogg L. Access to tuberculosis care: what did chronic cough patients experience in the way of healthcare-seeking? Scand J Public Health. 2007;35(4):396–402.
56. Leung ECC, Leung CC, Tam CM. Delayed presentation and treatment of newly diagnosed pulmonary tuberculosis patients in Hong Kong. Hong Kong Med J. 2007 Jun;13(3):221–7.

57. Storla DG, Yimer S, Bjune GA. A systematic review of delay in the diagnosis and treatment of tuberculosis. BMC Public Health. 2008;8:15.
58. Basnet R, Hinderaker SG, Enarson D, Malla P, Mørkve O. Delay in the diagnosis of tuberculosis in Nepal. BMC Public Health. 2009;9:236.
59. Ananthakrishnan R. JCDR - Care seeking, Tuberculosis, Patient delay, Delay in diagnosis, Chennai, Private health sector [Internet]. Journal of clinical and diagnostic research. [cited 2016 Sep 22]. Available from: http://www.jcdr.net/article_fulltext.asp?issn=0973-709x&year=2012&month=August&issue=6&id=2312
60. Lock WA, Ahmad RA, Ruiter RAC, van der Werf MJ, Bos AER, Mahendradhata Y, et al. Patient delay determinants for patients with suspected tuberculosis in Yogyakarta province, Indonesia. Trop Med Int Health. 2011 Dec;16(12):1501–10.
61. Ndeikoundam Ngangro N, Chauvin P, Halley des Fontaines V. [Determinants of tuberculosis diagnosis delay in limited resources countries]. Rev Epidemiol Sante Publique. 2012 Feb;60(1):47–57.
62. Belay M, Bjune G, Ameni G, Abebe F. Diagnostic and treatment delay among Tuberculosis patients in Afar Region, Ethiopia: a cross-sectional study. BMC Public Health. 2012;12:369.

63. Rossato Silva D, Müller AM, de Tarso Roth Dalcin P. Factors associated with delayed diagnosis of tuberculosis in hospitalized patients in a high TB and HIV burden setting: a cross-sectional study. BMC Infectious Diseases. 2012;12:57.
64. Li Y, Ehiri J, Tang S, Li D, Bian Y, Lin H, et al. Factors associated with patient, and diagnostic delays in Chinese TB patients: a systematic review and meta-analysis. BMC Med. 2013;11:156.
65. Hamza A. Pulmonary tuberculosis case detection in South Sudan [Internet]. Scientific Research- An academic publisher. [cited 2016 Sep 6]. Available from: http://www.southsudanmedicaljournal.com/archive/november-2012/pulmonary-tuberculosis-case-detection-in-south-sudan.html.
66. Osei E, Akweongo P, Binka F. Factors associated with DELAY in diagnosis among tuberculosis patients in Hohoe Municipality, Ghana. BMC Public Health. 2015;15:721.
67. Cai J, Wang X, Ma A, Wang Q, Han X, Li Y. Factors Associated with Patient and Provider Delays for Tuberculosis Diagnosis and Treatment in Asia: A Systematic Review and Meta-Analysis. PLoS One [Internet]. 2015 Mar 25 [cited 2016 Sep 7];10(3). Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4373856/.
68. Labour Bureau Government of India [Internet]. [cited 2016 Sep 23]. Available from: http://labourbureau.nic.in/MW3ch5.htm.
69. censusindia.gov.in/2011-Documents/On_Slums-2011Final

ANNEXURE I

IEC CERTIFICATE

From	To
The City Health Officer, Corporation of Chennai Rippon Buildings, Chennai-600 003.	The Professor & HOD, Dept.of Community Medicine, Govt. Kilpuk Medical College, Chennai-600 010.

Ref. No: RNTCP/100-2015 Dated: 14/12/2015

Sub: Kilpauk Medical College Post Graduate Student – Study on "Diagnostic Delays in Tuberculosis – A Cross Sectional Study" in the three Tuberculosis Units of Zone 8, Chennai Corporation – permission requested – Reg.

Ref: Letter from the Professor & HOD, Dept. of Community Medicine, Govt.Kilpauk Medical College, Chennai – 10, dated: 05.10.2015.

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With reference to your letter cited above, Corporation of Chennai is pleased to accord permission for the study programme to be conducted by Dr.Jabamalar, Post Graduate of Community Medicine Department of Govt. Kilpauk Medical College, Chennai.

You are requested to follow the following terms and conditions while executing the study for which the permission is granted.

1. The study should be conducted as per the objectives in the proposal.
2. The Corporation of Chennai will not provide any monetary or human resource support for this study
3. The findings of the study should be submitted to the Principal Secretary/ Commissioner, Corporation of Chennai before any formal publication.
4. The progress of the study to be discussed with City Health Officer on a quarterly basis.

For City Health Officer
14/12/15

ANNEXURE II

PERMISSION FROM CORPORATION OF CHENNAI

INSTITUTIONAL ETHICAL COMMITTEE
GOVT. KILPAUK MEDICAL COLLEGE,
CHENNAI-10
Protocol ID. No.02/07/2015 Meeting held on 04/06/2015
CERTIFICATE OF APPROVAL

The Institutional Ethical Committee of Govt. Kilpauk Medical College, Chennai reviewed and discussed the application for approval "Diagnostic delay in pulmonary tuberculosis – a cross sectional study – For Dissertation Purpose" submitted by Dr.J.Jebamalar, Post Graduate in MD (Com. Med.) Govt. Kilpauk Medical College, Chennai.

The Proposal is APPROVED.

The Institutional Ethical Committee expects to be informed about the progress of the study any Adverse Drug Reaction Occurring in the Course of the study any change in the protocol and patient information / informed consent and asks to be provided a copy of the final report.

GOVT. KILPAUK MEDICAL COLLEGE * Kilpauk, Chennai-10. * JUL

CHAIRMAN
Ethical Committee
Govt. Kilpauk Medical College, Chennai

10/07/2015

ANNEXURE III

QUESTIONNAIRE – ENGLISH

Questionnaire
Diagnostic delay in Tuberculosis

1. TB register no:
2. Code of health facility
3. Name of interviewer:
4. Date of interview: dd/mm/yyyy:

Socio-demographic characteristics and risk factors:

5. Name (Last, first, middle): _____
6. Age (Years):
7. Sex:
8. Number of household members:
9. Number of rooms in the house:
10. City:_____ Full address:_____
11. Educational level:
    - Higher secondary/college
    - Primary/middle/high school
    - Illiterate/read & write
12. Occupation: _____
    - Skilled
    - Semi-skilled
    - Unskilled
    - Student
    - Unemployed/Home maker
13. Income: _____
    - Savings
    - Income= expenses
    - Debt
14. Socio-economic status: _____
15. Residence:
    - Urban
    - Urban slum
    - Homeless/displaced
16. Marital status:
    - Married
    - Single
    - Divorced/separated
    - Widowed

17. History of smoking
    - Never
    - Current smoker
    - Quit smoking
18. If smoker, specify the amount of daily consumption: (number of cigarettes/day): _____
19. Duration of smoking: ____ years ____ months
20. Previous exposure to TB patients
21. Nationality: if national, ethic group, tribe etc
22. Other chronic diseases: (e.g HIV/AIDS, Diabetes, COPD, disability)

History of current illness:
Chief symptoms and date of onset of the current illness:
23. Cough
24. Date 1 (dd/mm//yyyy): [ ] [ ] [ ]
25. Fever
26. Date 2 (dd/mm//yyyy): [ ] [ ] [ ]
27. Loss of weight
28. Date 3 (dd/mm//yyyy): [ ] [ ] [ ]
29. Hemoptysis
30. Date 4 (dd/mm//yyyy): [ ] [ ] [ ]
31. Chest pain
32. Date 5 (dd/mm//yyyy): [ ] [ ] [ ]
33. Others (specify)
34. Date 6 (dd/mm//yyyy): [ ] [ ] [ ]
35. Which symptoms made you seek health care:
36. Health seeking behaviour with the onset of symptoms (before initial diagnosis and the cost of one consultation)

First action	Code	Date (dd/mm/yyyy)	Total expenses
HCP	0		
Self-medication	1		
Traditional medicine	2		
PHC worker at home	3		
Drug stores (Pharmacies)	4		
Others (specify)	5		

37. Date first seen by HCP for current illness (dd/mm/yyyy)

38. Health facility of the HCP whom you <u>first sought</u> his consultation:

Order	Code of facility	Dd/mm/yyyy
1st		
2nd		
3rd		
4th		
5th		

Code of health facility
TB centre [0]
PHC [1]
Chest hospital [2]
Public hospital/Outpatient clinic [3]
Private practice (hospital/clinic) [4]
Others (specify) [5]

39. If private practice, specify the specialty of the HCP whom you first sought the consultation:
    1. Chest specialist
    2. Internist
    3. GP
    4. Others (specify)

40. Reasons for the first consultation with the health facility with the onset of symptoms (first in order in question 38)

0	Accessible
1	Confidence in getting cured
2	Services available anytime
3	Referred by previous health service
4	Free services
5	Advised by anybody
6	Others (specify)

41. Reasons of non-consultation with the health facility (coded 0,1,2 in question 38) with the onset of symptoms (in case they did not consult 0,1,2)

0	Too far
1	Too busy/long waiting time
2	Bad experience
3	Others (specify)

Satisfaction with care (score: 0 best, 3 worst)

	Score	
42		Availability of services in PHC/TB centres
43		Prompt action from HCP in PHC

44		PHC well equipped
45		PHC giving free medicine
46		There is enough PHC in the area
47		Health facility workload
48		Waiting time (0= <15 min, 1: 15-30 min, 2: 30 min-1 hr, 3: >1 hr

49. Perceived causes of delay in health seeking behaviour:

0	No delay
1	Fear of what would be found on diagnosis
2	Hoped their symptoms would go away on their own
3	Fear of social isolation
4	Economic constraints
5	Inadequate staff attitude
6	Poor quality of health services
7	Others (mention)

50. TB (stigma)

Strongly agree= 0	Agree = 1	Average = 2	Do not agree= 3	Do not agree at all= 4

1. Do you feel ashamed for having TB?
2. Do you have to hide TB diagnosis from other people?
3. Does TB affect your relation with others?
4. Is TB very costly due to the long duration of the disease?
5. Do you prefer to live isolated since you got the TB diagnosis?
6. Does TB affect your work performance?
7. Does TB affect your marital relation?
8. Does TB affect family responsibilities?
9. Do you think there is less chances of marriage due to TB diagnosis?
10. Does TB affect your family relations?
11. Does TB cause female infertility?
12. Does TB lead to serious complications during pregnancy?
13. Does TB affect breast feeding?
14. Does TB affect pregnancy outcome?
15. Is a girl unable to decide for getting TB treatment?

51. Date of first TB diagnosis: (dd/mm/yyyy)
52. No of encounters (HCP before initial diagnosis):
53. Health facility of the HCP who made the initial diagnosis: (by code mentioned in q.37)

54: Specialty of the HCP who made the initial diagnosis:

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

55. Action taken by the HCP who made the initial diagnosis [dd/mm/yyyy]

1. Sputum examination: date0
2. X ray: date1
3. Both: date 2
4. Referral: date 3
5. Others (specify): date 4

56. X ray: 1. Negative 2. Positive 3. Not performed

57. Date of initiation of treatment: [dd/mm/yyyy]

Accessibility to health facility providing treatment:

58. Time to reach home from the nearest public health facility:

1. <1/4 hr 2: ¼ - ½ hr 3. >1/2 to 1 hr 3: >1 hr

59. Distance (in km) from home to the nearest health facility providing treatment:

60. Have you previously heard of TB?

61. Source of information on TB:

0	Govt. campaign (media)
1	Education
2	Friends/relatives
3	TB disease in friends/relatives
4	Others (specify)

Correctness of information on TB:

[Yes/Right =0, No/Wrong= 1, not known= 2]

62				What kind of disease you have
63				Is TB hereditary?
64				Is TB contagious?
65				Is TB curable?
66				Do you know that there is a vaccine for TB?
67				Do you know the approximate duration of treatment?

ANNEXURE IV

QUESTIONNAIRE- TAMIL

காச நோயைக் கண்டுபிடித்தலில் ஏற்படும் தாமதம்:

நோயாளியின் கேள்விகள்:

1. நோயாளியின் பதிவு எண்
2. சுகாதார வசதியின் அடையாள எண்
3. நேர்முகத்தேர்வரின் பெயர்
4. நேர்முக நாள்

சமூக ஜனநாயக பங்கை பண்புகள் மற்றும் இடர் காரணிகள்

5. பெயர்
6. வயது (வருடங்கள்) :
7. பாலினம்
8. வீட்டு உறுப்பினர்கள் எண்ணிக்கை:
9. வீட்டில் அறைகள் எண்ணிக்கை:
10. மாவட்டம்:

முழு முகவரி: ---------- ----

11. கல்வி நிலை:
    a) பல்கலைக்கழகம் /முதுகலை
    b) தொடக்கப்பள்ளி /நடுநிலை/ மேல்நிலை
    c) படிப்பறிவு இல்லாதவர்/ எழுதப்படிக்க தெரிந்தவர்
12. தொழில்:
    a) தொழிற்கல்வி/ வல்லுனர்கள்
    b) அலுவலர் /
    c) தொழிலாளி
    d) மாணவர்
    e) வேலை இல்லாதவர்/ இல்லத்தரசி
13. வருமானம்:
    a) சேமிப்பு
    b) வருமான = செலவுகள்
    c) கடன்

14. குடியிருப்பு:

a) மாநகரம்

b) நகராட்சி

c) கிராமம்

d) வீடு இல்லாதவர்கள்

15. திருமண நிலை:

a) திருமணம் ஆனவர்

b) திருமணம் ஆகாதவர்

c) விவாகரத்து பெற்றவர்

d) பிரிந்து இருப்பவர்

e) விதவை

16. புகைபிடிக்கும் வரலாறு:

a) இல்லை

b) தற்போது புகை பிடித்தல்

c) நிறுத்திவிடுதல்

17. புகை பிடிக்கும் பழக்கம் இருந்தால் தினசரி பயன் படுத்தும் அளவு (சிகரெட் / நாள் எண்ணிக்கை)

18. புகைபிடிக்கும் காலம்: ஆண்டுகள் --------; மாதங்கள் ----------

19. காச நோயாளியுடன் தொடர்பு இருந்ததா?

20. தேசியம்: ------------------

தேசிய என்றால், போன்றவை இன குழு, பழங்குடி, குறிப்பிடவும்: ----------

21. மற்ற நாட்பட்ட நோய்கள் (எ.கா. எச்.ஐ.வி / எய்ட்ஸ், சர்க்கரை நோய், ஊனம், போன்றவை.): ----------

தற்போதைய நோய் வரலாறு

தலைமை அறிகுறிகள் மற்றும் தற்போதைய நோய் தொடங்கிய தேதி:

22. இருமல் _____

23. நாள் _____

24. காய்ச்சல்_____

25. நாள் _____

26. எடை குறைதல் _____

27. நாள் _____

28. இரத்த காசம்_____

29. நாள் _____

30. மார்பு வலி _____

31. நாள் _____

32. இதர அறிகுறிகள்_____

33. நாள்_____

34. எந்த அறிகுறிகளால் மருத்துவத்தை நாடினீர்கள்_____

35. அறிகுறிகளால் சுகாதாரம் எதிர்நோக்கும் நடத்தை (நோய் கண்டறியும் முன்) மற்றும் முதல் மருத்துவச்செலவுகள்

முதல் செயல்	குறியீடு	தேதி	மொத்த செலவு
சுகாதார பயிற்சியாளர்	0		
சுய மருந்து	1		
பாரம்பரிய மருந்து	2		
வீட்டில்	3		
மருந்துக்கடைகள்	4		
மற்றவை	5		

36. தற்போது உள்ள நோய்க்காக மருத்துவமனையை முதலில் நாடிச்சென்ற தினம்

37. முதலில் சென்ற மருத்துவமனையின் வகை

வரிசை	அடையாள எண்	நாள்

1	காச நோய் நிலையம்
2	ஆரம்ப சுகாதார நிலையம்
3	நெஞ்சக மருத்துவம்
4	பொது மருத்துவமனை
5	வெளி நோயாளிப்பிரிவு
6	தனியார் மருத்துவமனை
7	மற்றவை

38. தனியார் மருத்துவமனையாக இருப்பின் மருத்துவமனையின் வகை

a) நெஞ்சக நோய் மருத்துவர்
b) பயிற்சி மருத்துவர்
c) பொது மருத்துவர்
d) மற்றவை

39. அறிகுறிகள் தோன்றிய பின் சுகாதார வசதியை நாடிய காரணங்கள்

0	அருகில் இருப்பதால்
1	சுகாதார வசிதியின் மீதுள்ள நம்பிக்கை
2	எப்போதும் கிடைக்கும் சேவை
3	முந்தைய மருத்துவரின் பரிந்துரை
4	இலவச சிகிச்சை
5	மற்றவரின் அறிவுரை
6	மற்றவை

40. நோயின் அறிகுறிகளின் பின்னரும் மருத்துவமனையை நாடாத காரணம்

0	மிக தொலைவில் இருத்தல்
1	அதிக வேலை/ நீண்ட நேரம் காத்திருத்தல்
2	மோசமான அனுபவம்
3	மற்றவை

சிகிச்சையின் மீதுள்ள திருப்தி (0 = சிறந்தது , 3 = திருப்தியில்லை)

41		காச நோய் நிலையத்தில்/ ஆ. சு. நிலையத்தில் உள்ள சேவைகள்
42		மருத்துவமனையின் உடனடி செயல்பாடுகள்
43		ஆ. சு. நிலையத்தில் சிறப்பான வசதிகள்
44		இலவச மருந்துகள்
45		மையத்தில் போதிய இட வசதி
46		சுகாதார மையத்தின் பணிச்சுமை
47		காத்திருக்கும் நேரம் (0= 0-15 நிமிடங்கள், 1= 15-30, 2= >30, 3 = >60)

48. சுகாதாரம் நோக்கும் நடத்தையின் தாமதத்தின் காரணங்கள்

0		தாமதம் இல்லை
1		நோயைக் கண்டுபிடித்தலில் பயம்
2		இயற்கையாகவே நோய் குணமாகும் என்ற நம்பிக்கை(மறைத்தல் மற்றும் மறுத்தல்)
3		சமூகத்தினால் தனிமைப்படுத்தப்படும் அச்சம்
4		பொருளாதார தடைகள்
5		குறைவான ஊழியர்கள் அணுகுமுறை
6		பொது சுகாதார சேவைகள் 6 தரம்
7		மற்றவை

0= உறுதியாக ஏற்று கொள்கிறேன், 1 = ஏற்று கொள்கிறேன், 2=

நடு நிலை, 3= ஏற்றுக்கொள்ளவில்லை, 4 = உறுதியாக ஏற்றுக்கொள்ளவில்லை

49. **காச நோய் களங்கம்**

1. காச நோய் இருப்பதால் வெட்கப்படுகிறாயா?
2. காச நோய் இருப்பதை மற்றவர்களிடம் இருந்து மறைக்கிறாயா?
3. காச நோய் காசநோய் மற்றவர்களுடன் உறவை பாதிக்கிறதா ?
4. காச நோய் குணமாக நீண்ட நாள் பொருள் செலவு ஏற்படுகிறதா?
5. காச நோய் இருப்பதால் தனித்து வாழ ஆசைப்படுகிறாயா ?
6. காசநோய் உங்கள் பணி செயல் திறனை பாதிக்கிறதா ?
7. காச நோயால் திருமணம் பாதிக்கிறதா ?
8. காச நோயால் குடும்ப பொறுப்புகள் பாதிக்கின்றனவா ?
9. காச நோயால் திருமண வாய்ப்புகள் குறைவாக உள்ளன என்று நினைக்கின்றாயா?
10. காச நோயால் குடும்ப உறவுகள் பாதிக்கின்றனவா ?
11. காச நோயால் பெண்களின் கருத்தரிக்கும் வாய்ப்புக்கள் குறைகின்றனவா?
12. காச நோய் பெண்கள் கருவுற்றிக்கும் போதுபக்க விளைவுகளை ஏற்ப்படுத்துமா ?
13. காச நோயால் தாய்ப்பால் புகட்டுதலை பாதிக்கின்றதா ?
14. காச நோய் கருவுறும் தாய்க்கு பாதிப்பு விளைவிக்குமா ?
15. ஒரு பெண் காச நோய்க்கு சிகிச்சை பெற முடிவு எடுக்க முடிகின்றதா?

50. காச நோயை கண்டறிந்த நாள்

51. காச நோயை கண்டறியும் முன் சுகாதாரம் கோரி சென்ற சந்திப்புகளின் எண்ணிக்கை

52. காச நோய் என்று கண்டறிந்த மருத்துவமனை

53. மருத்துவமனையின் சிறப்புப்பிரிவு

1. நெஞ்சக நோய் மருத்துவர்
2. பயிற்சி மருத்துவர்
3. பொது மருத்துவர்
4. மற்றவை

54. காச நோய் என்று கண்டறிந்ததும் மருத்துவரின் செயல்பாடு

1. சளி பரிசோதனை
2. ஊடு கதிர்
3. இரண்டும்
4. வேறொரு மருத்துவரிடம் பரிந்துரை
5. மற்றவை

55. ஊடு கதிரில் அறிகுறிகள்

1. இருந்தன
2. இல்லை
3. செயப்படவில்லை

56. சிகிச்சை துவக்கத்தின் தேதி

பொது சுகாதார வசதிகளை பெறும் வசதி

57. பொது சுகாதார நிலையத்தை அடைய ஆகும் நேரம்

1. < ½ மணி நேரம் 2. ½-1 3. >1

58. சிகிச்சை வழங்கும் பொது சுகாதார வசதியினை அடையும் தூரம்

காச நோயை குறித்த நோயாளியின் அறிவு

59. காச நோயைப்பற்றி இதற்க்கு முன் கேள்விப்பட்டு உள்ளாயா ?

60. காச நோயைப்பற்றி எதன் மூலம் அறிந்து கொண்டாய் ?

0	கல்வி அறிவு
1	ஊடகம்
2	நண்பர்/உறவினர்
3	நண்பர்/உறவினர் காச நோயால் பாதிக்கப்பட்டதால்
4	மற்றவை

காச நோயை குறித்த சரியான தகவல்கள்

[ஆம் சரி-0], [இல்லை /தவறு-1], [தெரியவில்லை-2]

காச நோயை குறித்த சரியான தகவல்கள்

61				உங்களுக்கு வந்துள்ள நோய் எது?
62				காச நோய் பரம்பரை வியாதியா?
63				காச நோய் தொற்று நோயா?
64				காச நோயை குணப்படுத்த முடியுமா?
65				காச நோய்க்கு தடுப்பூசி உள்ளதா?
66				காச நோய்க்கு சிகிச்சை காலம் தெரியுமா?
67				காச நோய்க்கு தரப்படும் மருந்து வகைகளை தெரியுமா?

காச நோயைக் கண்டுபிடித்தலில் ஏற்படும் தாமதம்:

நோயாளியின் கேள்விகள்:

12. நோயாளியின் பதிவு எண்
13. சுகாதார வசதியின் அடையாள எண்
14. நேர்முகத்தேர்வரின் பெயர்
15. நேர்முக நாள்

சமூக ஜனநாயக பங்கை பண்புகள் மற்றும் இடர் காரணிகள்

16. பெயர்
17. வயது (வருடங்கள்) :
18. பாலினம்
19. வீட்டு உறுப்பினர்கள் எண்ணிக்கை:
20. வீட்டில் அறைகள் எண்ணிக்கை:

21. மாவட்டம்:

முழு முகவரி: ---------- ----

22. கல்வி நிலை:

d) பல்கலைக்கழகம் /முதுகலை

e) தொடக்கப்பள்ளி /நடுநிலை/ மேல்நிலை

f) படிப்பறிவு இல்லாதவர்/ எழுதப்படிக்க தெரிந்தவர்

41. தொழில்:

f) தொழிற்கல்வி/ வல்லுனர்கள்

g) அலுவலர் /

h) தொழிலாளி

i) மாணவர்

j) வேலை இல்லாதவர்/ இல்லத்தரசி

42. வருமானம்:

d) சேமிப்பு

e) வருமான = செலவுகள்

f) கடன்

43. குடியிருப்பு:

e) மாநகரம்

f) நகராட்சி

g) கிராமம்

h) வீடு இல்லாதவர்கள்

44. திருமண நிலை:

f) திருமணம் ஆனவர்

g) திருமணம் ஆகாதவர்

h) விவாகரத்து பெற்றவர்

i) பிரிந்து இருப்பவர்

j) விதவை

45. புகைபிடிக்கும் வரலாறு:

d) இல்லை

e) தற்போது புகை பிடித்தல்

f) நிறுத்திவிடுதல்

46. புகை பிடிக்கும் பழக்கம் இருந்தால் தினசரி பயன் படுத்தும் அளவு (சிகரெட் / நாள் எண்ணிக்கை)

47. புகைபிடிக்கும் காலம்: ஆண்டுகள் --------; மாதங்கள் ----------

48. காச நோயாளியுடன் தொடர்பு இருந்ததா?

49. தேசியம்: ------------------

தேசிய என்றால், போன்றவை இன குழு, பழங்குடி, குறிப்பிடவும்: ----------

50. மற்ற நாட்பட்ட நோய்கள் (எ.கா. எச்.ஐ.வி / எய்ட்ஸ், சர்க்கரை நோய், ஊனம், போன்றவை.): ---------

தற்போதைய நோய் வரலாறு

தலைமை அறிகுறிகள் மற்றும் தற்போதைய நோய் தொடங்கிய தேதி:

51. இருமல் _____

52. நாள் _____

53. காய்ச்சல்_____

54. நாள் _____

55. எடை குறைதல் _____

56. நாள் _____

57. இரத்த காசம்_____

58. நாள் _____

59. மார்பு வலி _____

60. நாள் _____

61. இதர அறிகுறிகள்_____

62. நாள்_____

63. எந்த அறிகுறிகளால் மருத்துவத்தை நாடினீர்கள்_____

64. அறிகுறிகளால் சுகாதாரம் எதிர்நோக்கும் நடத்தை (நோய் கண்டறியும் முன்) மற்றும் முதல் மருத்துவச்செலவுகள்

முதல் செயல்	குறியீடு	தேதி	மொத்த செலவு
சுகாதார பயிற்சியாளர்	0		
சுய மருந்து	1		
பாரம்பரிய மருந்து	2		
வீட்டில்	3		
மருந்துக்கடைகள்	4		
மற்றவை	5		

65. தற்போது உள்ள நோய்க்காக மருத்துவமனையை முதலில் நாடிச்சென்ற தினம்

66. முதலில் சென்ற மருத்துவமனையின் வகை

வரிசை	அடையாள எண்	நாள்

1	காச நோய் நிலையம்
2	ஆரம்ப சுகாதார நிலையம்
3	நெஞ்சக மருத்துவம்
4	பொது மருத்துவமனை
5	வெளி நோயாளிப்பிரிவு
6	தனியார் மருத்துவமனை
7	மற்றவை

67. தனியார் மருத்துவமனையாக இருப்பின் மருத்துவமனையின் வகை

e) நெஞ்சக நோய் மருத்துவர்

f) பயிற்சி மருத்துவர்

g) பொது மருத்துவர்

h) மற்றவை

68. அறிகுறிகள் தோன்றிய பின் சுகாதார வசதியை நாடிய காரணங்கள்

0	அருகில் இருப்பதால்
1	சுகாதார வசிதியின் மீதுள்ள நம்பிக்கை
2	எப்போதும் கிடைக்கும் சேவை
3	முந்தைய மருத்துவரின் பரிந்துரை
4	இலவச சிகிச்சை
5	மற்றவரின் அறிவுரை
6	மற்றவை

69. நோயின் அறிகுறிகளின் பின்னரும் மருத்துவமனையை நாடாத காரணம்

0	மிக தொலைவில் இருத்தல்
1	அதிக வேலை/ நீண்ட நேரம் காத்திருத்தல்
2	மோசமான அனுபவம்
3	மற்றவை

சிகிச்சையின் மீதுள்ள திருப்தி (0 = சிறந்தது , 3 = திருப்தியில்லை)

41		காச நோய் நிலையத்தில்/ ஆ. சு. நிலையத்தில் உள்ள சேவைகள்
42		மருத்துவமனையின் உடனடி செயல்பாடுகள்
43		ஆ. சு. நிலையத்தில் சிறப்பான வசதிகள்
44		இலவச மருந்துகள்

45		மையத்தில் போதிய இட வசதி
46		சுகாதார மையத்தின் பணிச்சுமை
47		காத்திருக்கும் நேரம் (0= 0-15 நிமிடங்கள், 1= 15-30, 2= >30, 3 = >60)

48. சுகாதாரம் நோக்கும் நடத்தையின் தாமதத்தின் காரணங்கள்

0		தாமதம் இல்லை
1		நோயைக் கண்டுபிடித்தலில் பயம்
2		இயற்கையாகவே நோய் குணமாகும் என்ற நம்பிக்கை(மறைத்தல் மற்றும் மறுத்தல்)
3		சமூகத்தினால் தனிமைப்படுத்தப்படும் அச்சம்
4		பொருளாதார தடைகள்
5		குறைவான ஊழியர்கள் அணுகுமுறை
6		பொது சுகாதார சேவைகள் 6 தரம்
7		மற்றவை

0= உறுதியாக ஏற்று கொள்கிறேன், 1 = ஏற்று கொள்கிறேன், 2=
நடு நிலை, 3= ஏற்றுக்கொள்ளவில்லை, 4 = உறுதியாக ஏற்றுக்கொள்ளவில்லை

49. காச நோய் களங்கம்

16. காச நோய் இருப்பதால் வெட்கப்படுகிறாயா?
17. காச நோய் இருப்பதை மற்றவர்களிடம் இருந்து மறைக்கிறாயா?
18. காச நோய் காசநோய் மற்றவர்களுடன் உறவை பாதிக்கிறதா ?
19. காச நோய் குணமாக நீண்ட நாள் பொருள் செலவு ஏற்படுகிறதா?
20. காச நோய் இருப்பதால் தனித்து வாழ ஆசைப்படுகிறாயா ?

21. காசநோய் உங்கள் பணி செயல் திறனை பாதிக்கிறதா ?
22. காச நோயால் திருமணம் பாதிக்கிறதா ?
23. காச நோயால் குடும்ப பொறுப்புகள் பாதிக்கின்றனவா ?
24. காச நோயால் திருமண வாய்ப்புகள் குறைவாக உள்ளன என்று நினைக்கின்றாயா?
25. காச நோயால் குடும்ப உறவுகள் பாதிக்கின்றனவா ?
26. காச நோயால் பெண்களின் கருத்தரிக்கும் வாய்ப்புக்கள் குறைகின்றனவா?
27. காச நோய் பெண்கள் கருவுற்றிக்கும் போதுபக்க விளைவுகளை ஏற்ப்படுத்துமா ?
28. காச நோயால் தாய்ப்பால் புகட்டுதலை பாதிக்கின்றதா ?
29. காச நோய் கருவுறும் தாய்க்கு பாதிப்பு விளைவிக்குமா ?
30. ஒரு பெண் காச நோய்க்கு சிகிச்சை பெற முடிவு எடுக்க முடிகின்றதா?

50. காச நோயை கண்டறிந்த நாள்
51. காச நோயை கண்டறியும் முன் சுகாதாரம் கோரி சென்ற சந்திப்புகளின் எண்ணிக்கை
52. காச நோய் என்று கண்டறிந்த மருத்துவமனை
53. மருத்துவமனையின் சிறப்புப்பிரிவு
5. நெஞ்சக நோய் மருத்துவர்
6. பயிற்சி மருத்துவர்
7. பொது மருத்துவர்
8. மற்றவை
54. காச நோய் என்று கண்டறிந்ததும் மருத்துவரின் செயல்பாடு
6. சளி பரிசோதனை

7. ஊடு கதிர்

8. இரண்டும்

9. வேறொரு மருத்துவரிடம் பரிந்துரை

10. மற்றவை

55. ஊடு கதிரில் அறிகுறிகள்

4. இருந்தன

5. இல்லை

6. செயப்படவில்லை

56. சிகிச்சை துவக்கத்தின் தேதி

பொது சுகாதார வசதிகளை பெறும் வசதி

61. பொது சுகாதார நிலையத்தை அடைய ஆகும் நேரம்

1. < ½ மணி நேரம் 2. ½-1 3. >1

62. சிகிச்சை வழங்கும் பொது சுகாதார வசதியினை அடையும் தூரம்

காச நோயை குறித்த நோயாளியின் அறிவு

63. காச நோயைப்பற்றி இதற்க்கு முன் கேள்விப்பட்டு உள்ளாயா ?

64. காச நோயைப்பற்றி எதன் மூலம் அறிந்து கொண்டாய் ?

0	கல்வி அறிவு
1	ஊடகம்
2	நண்பர்/உறவினர்
3	நண்பர்/உறவினர் காச நோயால் பாதிக்கப்பட்டதால்
4	மற்றவை

காச நோயை குறித்த சரியான தகவல்கள்

[ஆம் சரி-0], [இல்லை /தவறு-1], [தெரியவில்லை-2]

காச நோயை குறித்த சரியான தகவல்கள்

61				உங்களுக்கு வந்துள்ள நோய் எது?
62				காச நோய் பரம்பரை வியாதியா?
63				காச நோய் தொற்று நோயா?
64				காச நோயை குணப்படுத்த முடியுமா?
65				காச நோய்க்கு தடுப்பூசி உள்ளதா?
66				காச நோய்க்கு சிகிச்சை காலம் தெரியுமா?
67				காச நோய்க்கு தரப்படும் மருந்து வகைகளை தெரியுமா?

ANNEXURE V

INFORMATION TO PATIENTS AND INFORMED CONSENT FORM

TITLE: DIAGNOSTIC DELAY IN PULMONARY TUBERCULOSIS – A CROSS SECTIONAL STUDY

Investigator : Dr. Jebamalar. J
Name of the Participant:

Title :

You are invited to take part in this research study. We have got approval from the IEC. We would be asking you questions regarding Tuberculosis, so that appropriate measures for early diagnosis could be planned.

Date: Signature of the Investigator:

Place: Signature /thumb impression of the participant:

PATIENT CONSENT FORM

Study detail :

Study centre :

Patients Name :

Patients Age :

Identification Number :

Patient may check (√) these boxes

I confirm that I have understood the purpose of procedure for the above study. I have the opportunity to ask question and all my questions and doubts have been answered to my complete satisfaction. ☐

I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving reason, without my legal rights being affected. ☐

I understand that the ethical committee and the regulatory authorities will not need my permission to look at my health records ☐

However, I understand that my identity will not be revealed in any information released to third parties or published, unless as required under the law. I agree not to restrict the use of any data or results that arise from this study. ☐

I agree to take part in the above study and to comply with the instructions given during the study and faithfully cooperate with the study team and to immediately inform the study staff if I suffer from any deterioration in my health or well-being or any unexpected or unusual symptoms. ☐

I hereby consent to participate in this study. ☐

I hereby give permission to undergo complete clinical examination ☐

Signature/thumb impression: Signature of investigator:

Patients Name and Address: Study investigator's Name:

ANNEXURE VI

TAMIL CONSENT FORM

காச நோயைக் கண்டுபிடித்தலில் ஏற்படும் தாமதம்:

சுய ஒப்புதல் படிவம்

ஆய்வு செய்யப்படும் தலைப்பு :

ஆய்வு செய்யப்படும் இடம்:

பங்கு பெறுபவரின் பெயர்: வயது: எண் :

பங்கு பெறுபவர் இதனை (√) குறிக்கவும்

மேலே குறிப்பட்டுள்ள மருத்துவ ஆய்வின் விவரங்கள் எனக்கு விளக்கப்பட்டது. என்னுடைய சந்தேகங்களை கேட்கவும், அதற்கான விளக்கங்களை பெறவும் வாய்ப்பளிக்கப்பட்டுள்ளது என அறிந்து கொண்டேன். ☐

நான் இவ்வாய்வில் தன்னிசையாக தான் பங்கேற்கிறேன். எந்த காரணத்தினாலோ எந்த சட்டசிக்கலுக்கும் உட்படாமல் நான் இவ்வாய்வில் இருந்து விலகி கொள்ளலாம் என்றும் அறிந்து கொண்டேன். ☐

இந்த ஆய்வு சம்பந்தமாகவோ , இதை சார்ந்து மேலும் ஆய்வு மேற்கொள்ளும் போதும் இந்த ஆய்வில் பங்கு பெறும் மருத்துவர் என்னுடைய மருத்துவ அறிக்கைகக்ளை பார்ப்பதற்க்கு என் அனுமதி தேவையில்லை என அறிந்து கொள்கிறேன். ☐

இந்த ஆய்வின் மூலம் கிடைக்கும் தகவலையோ , முடிவையோ பயன்படுத்திக் கொள்ள மறுக்கமாட்டேன். ☐

இந்த ஆய்வில் பங்கு கொள்ள ஒப்புக் கொள்கிறேன். இந்த ஆய்வை மேற்கொள்ளும் மருத்துவ அணிக்கு உண்மையுடன் இருப்பேன் என்றும் உறுதியளிக்கிறேன். ☐

பங்கேற்பவரின் கையொப்பம் : _____ இடம் _____ தேதி _____

பங்கேற்பவரின் பெயர் மற்றும் விலாசம்:

சாட்சியாளரின் கையொப்பம் : _____ இடம் _____ தேதி _____

சாட்சியாளரின் பெயர் மற்றும் விலாசம்:

ஆய்வாளரின் கையொப்பம் : _____ இடம் _____ தேதி _____

ஆய்வாளரின் பெயர் : _____

ANNEXURE VII

LIST OF ABBREVIATIONS

DOTS	- Directly Observed Treatment Short course
HCP	- Health Care Provider
HIV	- Human Immunodeficiency virus
MDR- TB	- Multidrug resistant tuberculosis
MO – TC	- Medical Officer – Tuberculosis control
NTP	- National Tuberculosis Programme
PHC	- Primary Health Centre
PTB	- Pulmonary Tuberculosis
RNTCP	- Revised National Tuberculosis Control Programme
STS	- Senior Treatment Supervisor
TB	- Tuberculosis
TU	- Tuberculosis Unit
WHO	- World Health Organisation

ANNEXURE VIII

LIST OF TABLES

ANNEXURE IX

LIST OF FIGURES

ANNEXURE X

KEY TO MASTER CHART

1	sl_no	Serial number	Key
2	age	Age	
3	gender	Gender	1=Men, 2=Women
4	edu	Education	1= Higher secondary/college 2= Primary/middle/high school 3=Illiterate
5	occup	Occupation	1= Skilled, 2= Semi-skilled 3= Unskilled 4=Student 5= Unemployed/home makers
6	income	Income	1= savings, 2=income=expenses, 3=in debt
7	residence	Residence	1= urban , 2=urban slum
8	mar_stat	Marital status	1= married, 2=single, 3=divorced/separated, 4=widowed
9	h_smoke	H/o smoking	1=never smoked, 2=current smoker, 3= quit smoking
10	daily_con	Daily consumption of cigarettes	
11	dur_smoke	Duration of smoking (yrs)	
12	tb_contact	H/o contact with tb cases	1=Yes, 2=No
13	diabetes	Diabetes	1=Yes, 2=No
14	ht	Hypertension	1=Yes, 2=No
15	copd	COPD	1=Yes, 2=No
16	alcoholism	Alcoholism	1=Yes, 2=No
17	cough	Duration of cough (days)	
18	cough_hc	Health seeking for cough	1=Yes, 2=No
19	fever	Duration of fever (days)	
20	fever_hc	Health seeking for fever	1=Yes, 2=No
21	low	Duration of loss of weight	
22	low_hc	Health seeking for loss of wt	1=Yes, 2=No
23	hemp	Duration of haemoptysis	
24	hemp_hc	Health seeking for haemoptysis	1=Yes, 2=No
25	chest_pain	Duration of chest pain	
26	cp_hc	Health seeking for chest pain	1=Yes, 2=No
27	hsb_1	Health seeking behaviour 1	0=health care practitioner, 1=self medication, 2=traditional medicine, 3=religious, 4=drug store/pharmacies, 5=others
28	hsb_2	Health seeking behaviour 2	0=health care practitioner, 1=self medication, 2=traditional medicine, 3=religious, 4=drug store/pharmacies, 5=others
29	hsb_3	Health seeking behaviour 3	0=health care practitioner, 1=self medication, 2=traditional medicine, 3=religious, 4=drug store/pharmacies, 5=others

30	hcp_1	Health care practitioner 1	0=TB centres, 1=primary health centre, 4=private clinics
31	hcp_2	Health care practitioner 2	0=TB centres, 1=primary health centre, 4=private clinics
32	hcp_3	Health care practitioner 3	0=TB centres, 1=primary health centre, 4=private clinics
33	missed_first	Missed at first diagnosis	1=Diagnosed, 2=Missed
34	hcpexp	Expenditure for health care practitioner	
35	self_med	Self medication- expenses	
36	drug_store	Drug store- expenses	
37	reason_consultation	Reasons for consultation	0=accessible, 1=confidence in getting cured, 2=services available any time, 3=referred by previous hcp, 4=free services, 5=advised by somebody, 6=others
38	reas_notconsultation	Reasons for non-consultation	0=too far, 1=too long waiting time, 2=bad experience, 3=unable to walk, 4=inconvenient timings
39	available	Availability	0=worst, 1=neutral, 2=good, 3=best
40	promt_act	Prompt action by medical practitioner	0=worst, 1=neutral, 2=good, 3=best
41	equipped	Well equipped facility	0=worst, 1=neutral, 2=good, 3=best
42	free_med	Free medicines	0=worst, 1=neutral, 2=good, 3=best
43	sufficient	Sufficient in that area	0=worst, 1=neutral, 2=good, 3=best
44	workload	Work load	0=worst, 1=neutral, 2=good, 3=best
45	waiting_time	Waiting time	0=>45 min, 1=31-45 min, 2=16-30 min, 3=<15 min
46	fear	Fear of what would be found on diagnosis	1=YES, 2=No
47	go_away	Hoped symptoms would go away	1=YES, 2=No
48	econ	Economic constraints	1=YES, 2=No
49	work	Work timings	1=YES, 2=No
50	tb_ashamed	Ashamed of having tb	4=strongly agree, 3=somewhat agree, 2=neutral, 1=disagree, 0=strongly disagree
51	hide_diagnosis	Hiding diagnosis from others	4=strongly agree, 3=somewhat agree, 2=neutral, 1=disagree, 0=strongly disagree
52	relation_aff	Relations affected d/t tb	4=strongly agree, 3=somewhat agree, 2=neutral, 1=disagree, 0=strongly disagree
53	isolated	Feeling isolated d/t tb	4=strongly agree, 3=somewhat agree, 2=neutral, 1=disagree, 0=strongly disagree
54	work_perf	Work performance affected d/t tb	4=strongly agree, 3=somewhat agree, 2=neutral, 1=disagree, 0=strongly disagree
55	marital	Marital relations affected d/t tb	4=strongly agree, 3=somewhat agree, 2=neutral, 1=disagree, 0=strongly disagree
56	fam_resp	Family responsibilities affected	4=strongly agree, 3=somewhat agree, 2=neutral, 1=disagree, 0=strongly disagree
57	mrg_less	Less chances of marriage d/t/ tb	4=strongly agree, 3=somewhat agree, 2=neutral, 1=disagree, 0=strongly disagree

58	fam_rel	Family relations affected	4=strongly agree, 3=somewhat agree, 2=neutral, 1=disagree, 0=strongly disagree
59	fem_infer	TB - cause of female infertility	4=strongly agree, 3=somewhat agree, 2=neutral, 1=disagree, 0=strongly disagree
60	preg_compl	TB - cause of pregnancy complications	4=strongly agree, 3=somewhat agree, 2=neutral, 1=disagree, 0=strongly disagree
61	breast_fed	TB - affects breast feeding	4=strongly agree, 3=somewhat agree, 2=neutral, 1=disagree, 0=strongly disagree
62	preg_out	TB - affects pregnancy outcome	4=strongly agree, 3=somewhat agree, 2=neutral, 1=disagree, 0=strongly disagree
63	girl_decide	Girl - is she able to decide for TB treatment	4=strongly agree, 3=somewhat agree, 2=neutral, 1=disagree, 0=strongly disagree
64	no_encount	Number of encounters before diagnosis	
65	hcp_diag	Health facility which made the diagnosis	0=TB centres, 1=primary health centre, 4=private clinics
66	sputum	Sputum examination	1=Yes, 2=No
67	both	Both sputum examn & X ray	1=Yes, 2=No
68	xray	X ray findings	1=positive, 2=negative
69	time_taken	Time taken to reach the nearest public health facility	1=≤15 min,2=16-30 min, 3=31-45 min, 4=46-60 min, 5=>60 min
70	tb_heard	Have you heard of TB	1=Yes, 2=No
71	source	Source of information on TB	1=govt.campaigns/media, 1=educational institutions, 2=friends/relatives 3=TB patients
72	dis_kind	What kind of disease do you have	0=don't know, 1=wrong, 2=right
73	hereditary	Is TB hereditary	0=don't know, 1=wrong, 2=right
74	contagious	Is TB contagious	0=don't know, 1=wrong, 2=right
75	curable	Is TB curable	0=don't know, 1=wrong, 2=right
76	trt_dur	Do you know the approximate duration of treatment	0=don't know, 1=wrong, 2=right
77	pt_d	Patient delay	
78	hs_d	Health system delay	
79	diag_d	Diagnosis delay	
80	trt_dur	Treatment delay	
81	tot_d	Total delay	

ANNXURE XI - MASTER CHART

sl_no	age	gender	edu	occup	income	residence	mar_stat	h_smoke	daily_con	dur_smoke	tb_contact	diabetes	ht	copd	alcoholism	cough	cough_hc	fever	fever_hc	low	low_hc	hemp	hem_hc	chest_pain	cp_hc	hsb_1	hsb_2	hsb_3	hcp_1	hcp_2	hcp_3	missed_first
1	35	1	1	3	2	1	1	2	5	10	2	2	2	2	2	25	1	999	2	999	2	999	2	999	2	1	0	999	1	999	999	1
2	58	1	3	2	2	1	1	2	2	30	2	1	2	2	1	20	1	999	2	999	2	999	2	999	2	1	0	999	4	999	999	1
3	36	1	1	2	3	1	1	1	999	999	2	1	2	2	1	21	1	999	2	999	2	999	2	999	1	0	999	999	0	999	999	1
4	19	1	1	4	2	1	2	1	999	999	2	2	2	2	2	25	1	999	2	999	2	999	2	999	1	0	999	999	1	999	999	1
5	45	1	2	2	2	2	1	1	999	999	2	2	2	2	1	20	1	999	2	999	2	999	2	999	2	0	999	999	0	999	999	1
6	26	1	1	1	1	1	1	2	5	6	2	2	2	2	2	15	1	999	2	999	2	999	2	999	2	0	999	999	4	999	999	1
7	31	1	2	1	2	1	1	1	999	12	1	2	2	2	2	21	2	999	2	999	2	5	1	5	1	0	999	999	0	999	999	1
8	42	1	3	2	2	1	1	2	3	10	1	2	2	2	2	30	1	999	2	999	2	999	2	999	2	0	999	999	4	999	999	1
9	41	1	2	1	2	1	1	1	999	999	2	2	2	2	2	21	1	999	2	999	2	999	2	999	2	0	999	999	1	999	999	1
10	20	1	1	4	2	1	2	2	2	2	2	2	2	2	2	15	1	999	2	999	2	999	2	999	2	0	999	999	0	999	999	1
11	38	1	2	1	1	1	1	1	999	999	2	1	2	2	1	21	1	999	2	999	2	999	2	999	2	0	999	999	4	999	999	1
12	46	1	1	3	2	2	1	1	999	999	2	2	2	2	1	30	1	999	2	999	2	5	1	5	1	0	999	999	0	999	999	1
13	38	1	2	3	2	1	1	2	5	10	1	2	2	2	2	21	1	999	2	999	2	3	2	999	2	0	999	999	1	0	999	2
14	37	1	1	3	2	1	1	1	999	999	2	2	2	2	2	25	1	999	2	999	2	999	2	999	2	1	0	999	1	999	999	1
15	33	1	1	5	3	2	1	2	2	15	1	1	2	2	2	18	1	999	2	999	2	999	2	999	2	0	999	999	4	0	999	2
16	19	1	1	4	2	1	2	1	999	999	2	2	2	2	2	25	1	999	2	999	2	999	2	999	1	0	999	999	1	999	999	1
17	40	1	2	3	2	1	1	1	999	999	1	2	2	2	2	30	1	999	2	999	2	999	2	999	2	0	999	999	0	999	999	1
18	43	1	2	2	2	2	1	2	5	20	2	2	2	2	1	20	1	999	2	999	2	999	2	999	2	0	999	999	0	999	999	1
19	22	1	1	1	1	1	1	2	5	6	2	2	2	2	2	15	1	999	2	999	2	999	2	999	2	0	999	999	4	999	999	1
20	30	1	2	1	2	1	1	1	999	12	1	2	2	2	2	21	2	999	2	999	2	5	1	5	1	0	999	999	0	999	999	1
21	48	1	3	2	2	1	1	1	999	999	1	2	2	2	2	30	1	999	2	999	2	999	2	999	2	0	999	999	4	999	999	1
22	39	1	2	1	2	1	1	1	999	999	2	2	2	2	2	21	1	999	2	999	2	999	2	999	2	0	999	999	1	999	999	1
23	52	1	2	5	2	2	1	2	5	25	2	1	1	2	2	30	2	999	2	1	2	5	1	999	2	0	999	999	1	0	999	2
24	25	1	1	4	2	1	2	1	999	999	2	2	2	2	2	15	1	999	2	999	2	999	2	999	2	0	999	999	0	999	999	1
25	43	1	1	3	2	2	1	2	4	23	2	2	2	2	1	30	1	999	2	999	2	5	1	5	1	0	999	999	0	999	999	1
26	42	1	2	3	2	1	1	1	999	999	1	2	2	2	2	21	1	999	2	999	2	3	2	999	2	0	999	999	1	0	999	2
27	33	1	1	2	2	1	1	2	2	15	2	2	2	2	2	30	1	999	2	999	2	999	2	999	2	0	999	999	0	999	999	1
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29	61	1	3	2	2	1	1	2	5	35	2	1	2	2	1	20	1	999	2	999	2	999	2	999	2	1	0	999	4	999	999	1
30	33	1	1	5	3	2	1	1	999	999	1	1	2	2	2	18	1	999	2	999	2	999	2	999	2	0	999	999	4	0	999	2
31	26	1	1	1	2	1	1	2	2	5	2	2	2	2	2	21	1	999	2	999	2	999	2	999	2	0	999	999	0	999	999	1
32	26	1	1	1	1	1	1	2	5	6	2	2	2	2	2	15	1	999	2	999	2	999	2	999	2	0	999	999	4	999	999	1
33	37	1	2	1	2	1	1	2	5	12	1	2	2	2	2	21	2	999	2	999	2	5	1	5	1	0	999	999	0	999	999	1
34	39	1	2	1	2	1	1	1	999	999	2	2	2	2	2	21	1	999	2	999	2	999	2	999	2	0	999	999	1	999	999	1
35	20	1	1	4	2	1	2	2	2	3	2	2	2	2	2	15	1	999	2	999	2	999	2	999	2	0	999	999	0	999	999	1
36	35	1	2	1	1	1	1	1	999	999	2	1	2	2	1	21	1	999	2	999	2	999	2	999	2	0	999	999	4	999	999	1
37	44	1	1	3	2	2	1	2	3	15	2	2	2	2	1	30	1	999	2	999	2	5	1	5	1	0	999	999	0	999	999	1
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44	28	1	1	1	1	1	1	2	5	6	2	2	2	2	2	15	1	999	2	999	2	999	2	999	2	0	999	999	4	999	999	1
45	33	1	2	1	2	1	1	1	999	999	1	2	2	2	2	21	2	999	2	999	2	5	1	5	1	0	999	999	0	999	999	1
46	46	1	3	2	2	1	1	2	5	10	1	2	2	2	2	30	1	999	2	999	2	999	2	999	2	0	999	999	4	999	999	1
47	36	1	2	1	2	1	1	1	999	999	2	2	2	2	2	21	1	999	2	999	2	999	2	999	2	0	999	999	1	999	999	1
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50	42	1	1	3	2	2	1	1	999	999	2	2	2	2	1	30	1	999	2	999	2	5	1	5	1	0	999	999	0	999	999	1
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52	69	2	3	5	3	2	2	1	999	999	2	1	1	2	2	15	1	999	2	999	2	999	2	999	2	4	0	999	1	0	999	2
53	36	2	1	5	3	2	1	1	999	999	1	1	2	2	2	18	1	999	2	999	2	999	2	999	2	0	999	999	4	0	999	2
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55	68	2	2	5	3	2	1	1	999	999	2	2	1	2	2	14	1	999	2	999	2	999	2	999	1	4	0	999	1	999	999	1
56	37	2	2	3	2	1	1	1	999	999	1	2	2	2	2	30	1	999	2	999	2	999	2	999	2	0	999	999	0	999	999	1
57	27	2	1	2	2	1	1	1	999	999	2	1	2	2	2	16	1	999	2	999	2	999	2	999	2	0	999	999	0	999	999	1
58	37	2	2	2	2	1	1	1	999	999	2	2	2	2	2	30	1	999	2	999	2	999	2	999	2	1	0	999	1	999	999	1

59	47	2	2	5	2	2	1	1	999	999	2	1	1	2	2	30	2	999	2	1	2	5	1	999	2	0	999	999	1	0	999	2
60	51	2	2	5	2	2	1	1	999	999	1	1	1	2	2	30	1	999	2	999	2	999	2	999	2	0	999	999	1	0	999	2
61	51	2	2	5	3	2	1	1	999	999	2	1	1	2	2	30	1	999	2	999	2	999	2	999	2	0	999	999	1	0	999	2
62	35	2	1	2	2	1	1	1	999	999	2	2	2	2	2	30	1	999	2	999	2	999	2	999	2	0	999	999	0	999	999	1
63	62	2	3	2	2	1	1	1	999	999	2	1	2	2	1	20	1	999	2	999	2	999	2	999	2	1	0	999	4	999	999	1
64	66	2	3	5	3	2	2	1	999	999	2	1	1	2	2	15	1	999	2	999	2	999	2	999	2	4	0	999	1	0	999	2
65	24	2	1	1	2	1	1	1	999	999	2	2	2	2	2	21	1	999	2	999	2	999	2	999	2	0	999	999	0	999	999	1
66	64	2	2	5	3	2	1	1	999	999	2	2	1	2	2	14	1	999	2	999	2	999	2	999	1	4	0	999	1	999	999	1
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68	29	2	1	2	2	1	1	1	999	999	2	1	2	2	2	16	1	999	2	999	2	999	2	999	2	0	999	999	0	999	999	1
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preg_compl	breast_fed	preg_out	girl_decide	no_encount	hcp_diag	sputum	both	xray	time_taken	tb_heard	source	dis_kind	hereditary	contagious	curable	vaccine	trt_dur	pt_d	hs_d	diag_d	trt_d	tot_d
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