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**UNDERSTANDING SPECIFIC BARRIERS TO UTILIZATION OF TB CONTROL  
SERVICES BY TRIBAL PEOPLE TO HELP IN DESIGNING INCENTIVE PLAN**

A Thesis in

Industrial Engineering

by

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## Abstract

The objective of the study is to uncover barriers to utilization of TB Control services by Tribal people living in Visakha Agency area of Andhra Pradesh, India. The selection of this region was done after considering the fact that this region is covered under the government TB Control program for the past one year and availability of health worker resources from the District Tuberculosis Officer to conduct the survey. A mix of quantitative and qualitative survey questionnaire was designed to understand the relationship between accessibility and various factors such as socioeconomic status, educational level and working status. Sample of 1000 Tribal people spread across 10 villages of the Agency area were pre-selected from the Census data available using multi-stage sampling. The sample quota for each village was allocated based on the higher proportion of tribal population within the village to ensure a cost-effective way of achieving a better representation of core Tribal areas. The villages were then visited by a health worker after getting briefed on the details of the survey objectives and procedures to conduct interviews using the provided survey questionnaire. A response rate of 63.1% was achieved as in some instances, the census data was outdated and/or the person pre-selected was not accessible. Detailed accounts of all the 631 persons interviewed were recorded and analyzed in the study to identify key factors that influence utilization and accessibility of TB control services.

The results from the survey showed that the occurrence of TB symptoms increased with age up to 50 years and people living in tribal areas of Visakha agency region in between 25-50 years of age are found at a higher risk of being infected by TB than their younger counterparts. Possible indication of higher levels of transmission risk was observed among unskilled/daily wage labor workers as primary occupation of over half of symptomatic persons surveyed was unskilled/daily wage labor compared to only 28% of non-symptomatic population. In spite of the free treatment services and travel reimbursement provided by the government, symptomatic persons, who were advised to seek diagnosis/treatment but did not seek any treatment, was overwhelmingly high (37%). The primary reason for not seeking treatment reported was under par financial situation of the population in this region. Recommendations

are provided taking into account various significant observations made from the study to improve the treatment seeking behavior of the Tribal persons in this region.

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## Chapter 1. Introduction

India accounts for 21% of the global burden of Tuberculosis (TB) and it is one of the most important public health issues<sup>1</sup>. TB spreads through the air when people who are infected with it cough, sneeze, or speak. It is only when a person's immune system is compromised that he or she develops TB<sup>2</sup>. Symptoms of the disease include a lingering cough, chest pain, fever, weight loss, loss of appetite, and fatigue.

The disease is more prevalent in areas with economically depressed people. One reason for this is that multiple families share housing and work in buildings with poor ventilation. In addition, there are often refugee camps in depressed areas where people are forced to live together. It is estimated that as many as 50% of the world's refugees are infected with tuberculosis<sup>2</sup> and it is also common among homeless populations<sup>2</sup>.

### Epidemiological Perspective

Tuberculosis in the community is viewed as a long-term epidemic. It is estimated that nearly 3.5 million people in India are infected with the disease<sup>4, 5</sup>. The prevalence of sputum positive cases ranges between 2 and 8 per 1000 persons<sup>6, 7</sup>, and the annual incidence rate of fresh cases is 1.3 per 1000<sup>6, 7, 8</sup>. The average prevalence and annual incidence of the sputum smear positive cases and of all forms of Tuberculosis respectively, were used for estimating the case load in the community for purposes of planning and evaluating the program.

The Joint Tuberculosis Program Review (JTTPR) carried out by the Government of India (GOI) and the WHO in 2000 has observed that approximately 10 million persons could die of tuberculosis in India over the next 20 years<sup>9</sup>. Most surveys carried out so far, have provided data in support of a steady state of the epidemic of Tuberculosis in India. Both the suffering and death from Tuberculosis are thus seen as enormous and continuing burdens to the community at large.

Consequently, it is only through a long time frame of sustainable intervention with a high degree of efficiency, that it could be possible to reduce suffering and death of people due to tuberculosis. Case finding/treatment activities need to be organized in the nature of an on-

going service component of an integrated general health care delivery system. These need to be both accessible as well as sustainable over a long period of time.

In response to these requirements, the National Tuberculosis Control Program (NTCP) is being implemented through the existing primary health care system, without any vertical element at the point of service delivery.

The epidemiological characteristic of TB in India is also such, that it requires the program to be in place throughout the country as a whole due to high prevalence of sputum positive cases. The services under the program need to be readily accessible, more so for the underprivileged segments of the society like the tribal population groups.

The NTCP has shown a remarkable success since its implementation. In a population of more than 20 million in 13 states throughout the country; the quality of diagnosis is dramatically better than that of the previous program or of private practitioners<sup>10</sup>. Nearly 8 out of 10 patients diagnosed in the program since 1993 were cured; this cure rate is more than double that of the previous program<sup>10</sup>. Though the services have been made available, its utilization by the stakeholders at different levels of the society has not been up to satisfactory level<sup>10</sup>. The deprived ones are usually the poor and illiterates, who unfortunately are the ones, who are in its most urgent need<sup>11</sup>.

In view of the above, the government of India has significantly increased the national budget for TB control<sup>11</sup>. The TB control program which is being currently implemented across the country still has a long way to reach the underprivileged and poverty stricken population of India.

## **1.2 Rationale and Demographics**

It has been hypothesized that effective implementation of Direct Observation Treatment (DOT) will save hundreds of thousands of lives in India<sup>12</sup>. DOT has been deemed to be one of the most cost-effective health interventions. Each life saved represents a child, mother, or father who will go on to live productive, TB -free, longer life.

Generally, people belonging to Tribes, people living with AIDS, women and other marginalized groups are having lack of access to health services and low control over assets<sup>13</sup>. Most often diagnosis of Tuberculosis and appropriate treatment is generally delayed in these groups because of ignorance, poverty and variety of social economic and cultural reasons<sup>13</sup>. Tribal people account for over a quarter of the country's poorest people<sup>14</sup>. In addition people belonging to these groups most often have limited access to health care services<sup>14</sup>. The tribal people have low social status as well as weaker economic position. Their capacity to pay for health services is meager. Accessing even a free service through public health facility may result in one-day wage loss for many of them. Social cultural values also restrict them to get the services. Overall they have limited options and choices to access the health care services. Forced by the socio economic circumstances, often they are deprived of timely and appropriate treatment for the disease. On the other hand often health care providers pay less attention to them and many times deny the delivery of services to them<sup>15</sup>.

The study on utilization of TB control services by tribal population covers many villages in Visakha Agency region of Visakhapatnam District with a total sample of 1000 tribal persons. The area covered has the highest tribal population in the entire state of Andhra Pradesh with over 88% belonging to different tribes. The District presents two distinct Geographic divisions. The strip of the land along the coast and the interior called the plains division and hilly area of the Eastern Ghats flanking it on the North and West called the Agency Region. The Agency Region consists of the hilly regions covered by the Eastern Ghats with an altitude of about 900 meters dotted by several peaks exceeding 1200 meters. Sankaram Forest block topping with 1615 meters embraces the villages of Paderu, G. Madugula, Hukumpeta, Chintapalli, G. K. Veedhi, Koyyuru, Pedabayalu, Munchingiput, Dumbriguda, Arakuvalley and Ananthagiri shown in Figure 1.

Figure 1: Map of District

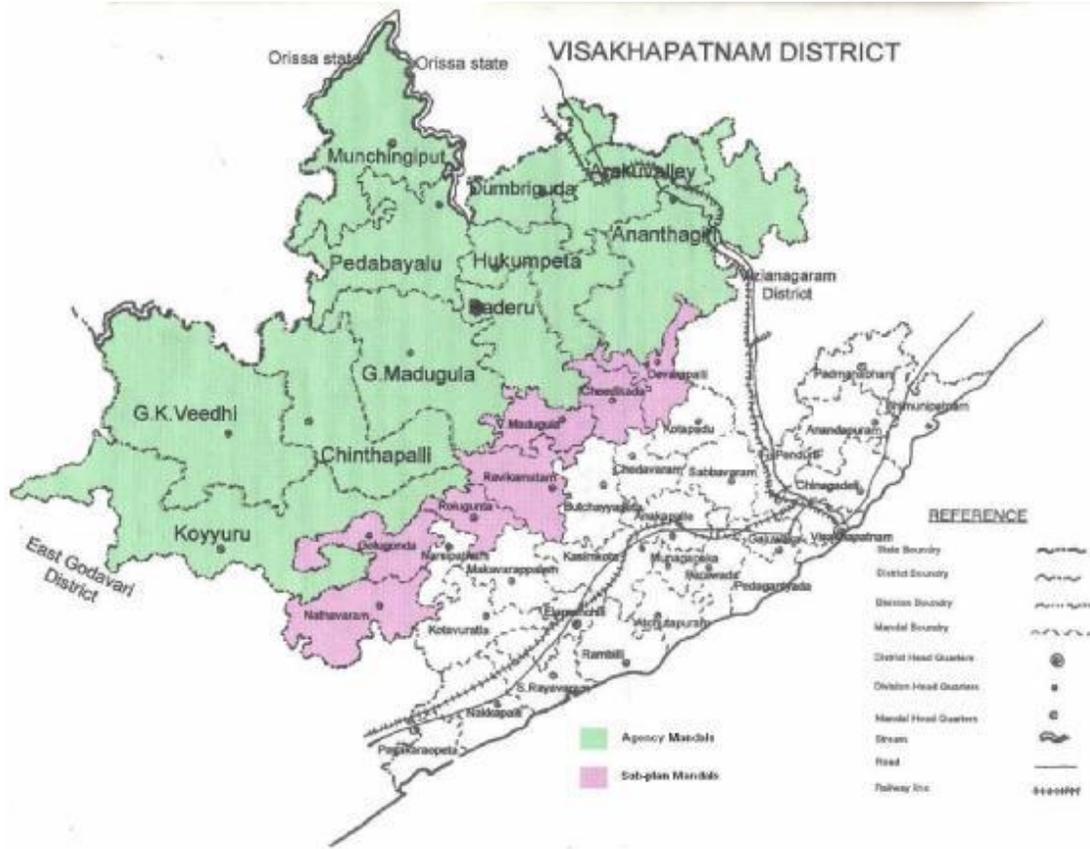


Table 1: Agency Region Demographics

<b>Total Population</b>	566,893
<b>Tribal Population</b>	503,874
<b>Others</b>	63,019
<b>Percentage to District Population</b>	13.2%
<b>Density</b>	90 per square kilometer
<b>Sex Ratio (Tribes)</b>	1007 Female per 1000 males

The TB control program aims to achieve a high cure rate of new sputum smear-positive patients there by interrupting the chain of transmission. The target rate for cure is at least 85%<sup>16</sup>. One of the program objectives is to improve access to services for all groups of the community

including marginalized groups, i.e., tribal community<sup>16</sup>. The program does not have any baseline information regarding utilization of services to the specified group in this area.

The study therefore serves the purpose of providing the baseline information regarding availability and accessibility of various TB control services to tribal people so that efforts can be made to, mainstream this group with the quality services.

### **1.3 Objectives of the Study**

The following were the objectives of the study:

1. To collect and analyze data on accessibility and utilization of different components of TB control services by the tribal population in Visakha Agency Area.
2. To understand the relationship between accessibility and various factors such as socioeconomic status, educational level, and working status.
3. To identify and document the reasons/barriers to utilization of the TB control services by tribal population.
4. To provide insights based on the findings, which would help in modifying policies or components of program implementation to equitable accessibility of services to this group of community.

## **Chapter 2. Methodology**

It is well known that tribal population being a marginalized group already has problems in accessing health care facilities. Numerous studies on tribal population have been conducted to understand the health care utilization pattern. To study the specific barriers that tribal people face, it is important to understand multiple aspects of their accessibility to the health care facilities such as awareness, logistics and socio-economic status.

### **2.1 Survey Schedule Design**

The pre-allocated samples of 1000 persons were selected from the region's Census data as the sampling frame. The sample was drawn from multiple villages in the region to provide a better representation of the entire region using a procedure described in the next sub section. To study the differential in utilization of TB control services among tribal people, all the villages had high tribal population.

The mix of quantitative and qualitative approaches has been used to understand the patient's perspective for utilizing the TB control services and provider's perspective for rendering services. All the persons were screened against the possible symptoms of tuberculosis and were interviewed with the help of a structured questionnaire. The discussion and consultation was done with District Tuberculosis Officer at district headquarters to converge on sample size, selection of persons for interview, sampling procedure based on cost-effectiveness and accessibility to the villages in the Agency area.

### **2.2 Sampling Procedure**

The tribal population in Census data has been used as a sampling frame. A multi stage sampling procedure is used for pre-selecting the sample. The villages with high concentration of tribal people were given priority in the selection of sample. The selection of region was largely dependent on the proportion of tribal population and implementation of TB control program in the district for more than one year. Random sampling has been used to select households and persons with symptoms of tuberculosis.

### **Selection of Region**

- The region must be covered under TB control program for more than one year.
- The region must have predominantly high inhabitant tribal population.
- The District Tuberculosis Officer (DTO) should be able to provide a health worker to interview the population in that region.
- Visakha Agency region was unanimous choice based on highest proportion of tribal population in the district of Visakhapatnam.

### **Selection of Village**

- All the villages in the Agency Region were arranged according to their proportion of tribal population as per census.
- Top 10 villages with highest tribal population were selected from the list of all villages to ensure better mix of population spread across the region.
- The selected villages from each region are verified for implementation of TB control program for the past one year.

### **Selection of Sample Respondents**

- A sample of 1000 persons was agreed upon based on cost of resources and budget constraints after consulting with the DTO.
- From the selected villages, the sample quota was allocated based on weight calculated from the percentage of tribal population in that village to ensure greater representation of villages with high tribal population.
- Since the reach to entire area of the village was not feasible due to remoteness of the villages, the sample was selected from center of villages with access to roads.

**Table 2: List of Villages under TB Control Program**

Village	Population			% Tribal	Sample Quota
	Tribal	Others	Total		
Hukumpeta	47,750	2,365	50,115	95%	105
Munchingiput	41,636	2,282	43,918	95%	105
G.Madugula	47,625	3,060	50,685	94%	104
Dumbriguda	41,928	2,945	44,873	93%	103
Pedabayalu	46,660	4,171	50,831	92%	102
Ananthagiri	40,057	4,135	44,192	91%	101
G.K.Veedhi	49,222	6,928	56,150	88%	98
Chinthapalli	55,956	8,448	64,404	87%	97
Arakuvalley	47,005	8,954	55,959	84%	93
Paderu	43,482	9,847	53,329	82%	92

## **2.3 Survey Questionnaire Design**

A survey questionnaire was designed based on various indicators that quantify the impact of age, literacy, occupation, economic status, logistics, etc. on accessibility for tribal people to the health care facilities and the level of utilization of TB control services.

### **2.3.1 Choice of Questions in the Questionnaire –Rationale**

The questions (Accessibility and Utilization factors) for the study were chosen so as to measure the relative impact of socio-economic factors, awareness and logistics in affecting the treatment seeking behavior of tribal people. The responses for these questions provide quantitative way to create a baseline data set to understand the performance of NTCP in these areas and in future could be used to monitor the new efforts launched by the program. In addition to quantitative assessment of the factors impacting treatment access and utilization by tribal people, the data would also provide additional learning and better insights for design of a new set of incentive/awareness campaign.

### 2.3.2 Questionnaire Modules

The module to assess the socio-economic profile of the respondents included understanding the demographic and financial attributes.

**Table 3: Demographics and Economic profile module**

**Demographics and Economic profile**

Age of the person (in completed years)

Sex of the person.

Marital status

Education level

Main occupation of the person

What is the primary source of income?

Type of house (observed)

Module identifying symptomatic persons and the symptoms reported included:

**Table 4: Symptomatic Person Identification module**

**Identifying Symptomatic Persons**

Is anybody in your household getting persistent cough for more than 3 weeks?

Is anybody in your household having chest pain for more than 2 weeks?

Does anybody in your household have blood in sputum?

Is anybody in your household having a low grade fever for last more than 15 days?

Is anybody in your household feeling weak and loss of weight since last three months?

Has anybody in your household been taking or initiated any medical treatment during the last six months?

What are the symptoms reported?

To understand the symptomatic person's accessibility and treatment seeking behavior, the following questions are asked to the respondents.

**Table 5: Treatment Seeking Behavior module**

**Accessibility and Treatment Seeking Behavior**

Did any health worker visit you in the last six months?

Have you mentioned the health worker about these problems?

Did the health worker advise you to go to health centre for this problem(s)?

If not did anyone else advice you to seek treatment?

Did you visit any doctor / hospital / health centre / local practitioners for this problem(s)?

What is the approximate distance to diagnostic center?

What is the approximate distance to treatment services?  
What is the approximate wait time for services?  
Why did you not visit?  
Where did you visit for the treatment of this problem?  
What test(s) were you advised for?  
Did you get your test(s) done?  
If yes, where?  
How many times tests were done?  
Why did you not get your test done?

Further, for the respondents who were symptomatic and diagnosed with TB, the following questions were asked to understand the utilization of the free TB control program and identify barriers preventing them to access even the free treatment.

**Table 6: Treatment Utilization by TB diagnosed population module**

**Treatment utilization in persons diagnosed with TB**

What was the diagnosis of the test?  
What was done after tests?  
Why did you discontinue or did not start the treatment?  
When did you start the treatment?

## **2.4 Survey Procedure**

- All the questions mentioned in the above sub section were arranged into a structured questionnaire (sample attached in Appendix).
- A health worker provided by DTO was trained in the objectives of the study, survey questionnaire and interview process before conducting the interviews.
- Interview process included the health worker visiting all the respondents pre-selected in the sample and filling out the questionnaire based on their responses.

The following study tools were used to conduct the survey:

- Interview schedule for the survey
- Detailed Survey Questionnaire

These tools were shared with the District Tuberculosis Officer and their suggestions were duly incorporated.

## **Chapter 3. Socio-economic profile and accessibility to TB control services**

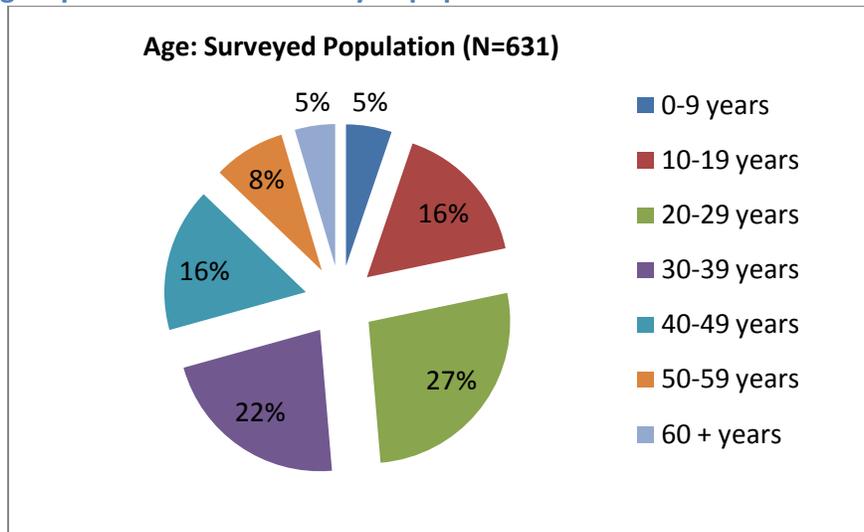
This chapter presents the brief characteristics of persons who reported symptoms indicative of tuberculosis at the time of survey and in some cases compare against those reported by non-symptomatic persons. The total sample size, detailed representations and illustrations based on data extracted from the study are presented in the sections to follow. The information on accessibility of TB control services reported by symptomatic persons has also been analyzed and presented in the chapter.

### **3.1 Background Information**

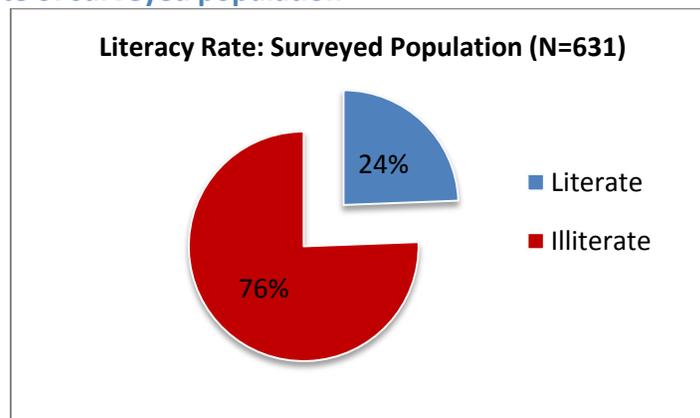
Figures 2, 3, 4 present the background information of the persons covered under the study. The study has covered 1000 persons with a response rate of 63.1% across different villages in Visakha Agency region. There were two major phases carried out to collect the data under the study. All the tribal people selected using sampling procedure described in the previous section were visited and detailed listing was prepared to identify the person with symptoms of tuberculosis. The persons who reported symptoms of tuberculosis were further interviewed to collect detailed information with permission from DTO on treatment seeking behavior, utilization of TB control services.

The dominant factor among the surveyed population is the low literacy rate – over three fourths of them were illiterate. The primary occupation reported by majority of respondents is ‘wage labor’ while, the highest percentage of population interviewed for the survey were in between 20-40 years of age.

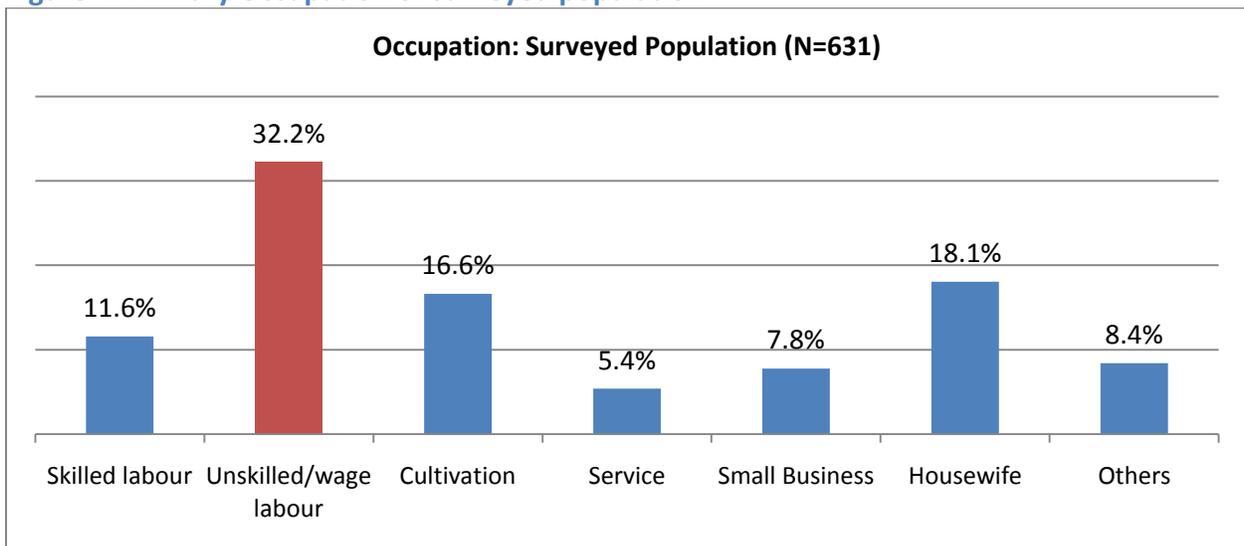
**Figure 2: Age group distribution of surveyed population**



**Figure 3: Literacy rate of surveyed population**



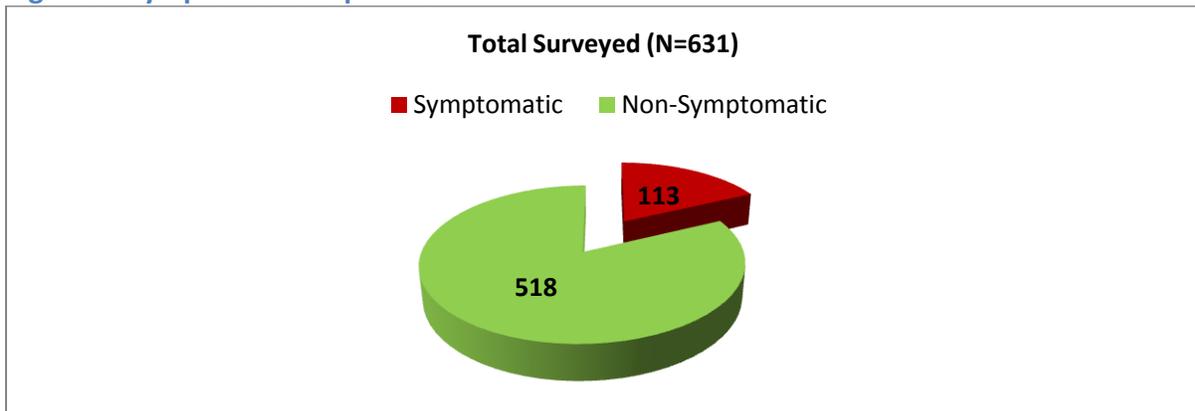
**Figure 4: Primary Occupation of surveyed population**



### 3.2 Symptomatic Persons Covered

During the survey, the persons were asked a series of questions: whether they had persistent cough for more than three weeks, chest pain, blood in sputum, low grade fever with rise in temperature in evening for last 15 days, feeling weak and loss of weight during last three months and joint pain or swelling or gland in any part of the body. The persons who reported at least persistent cough for more than three weeks or any other two such symptoms at the time of survey were identified as symptomatic and detailed information on treatment seeking behavior and utilization of TB control services was gathered. Out of the entire respondent population (N=631), 113 people were identified to be symptomatic.

**Figure 5: Symptomatic Population**

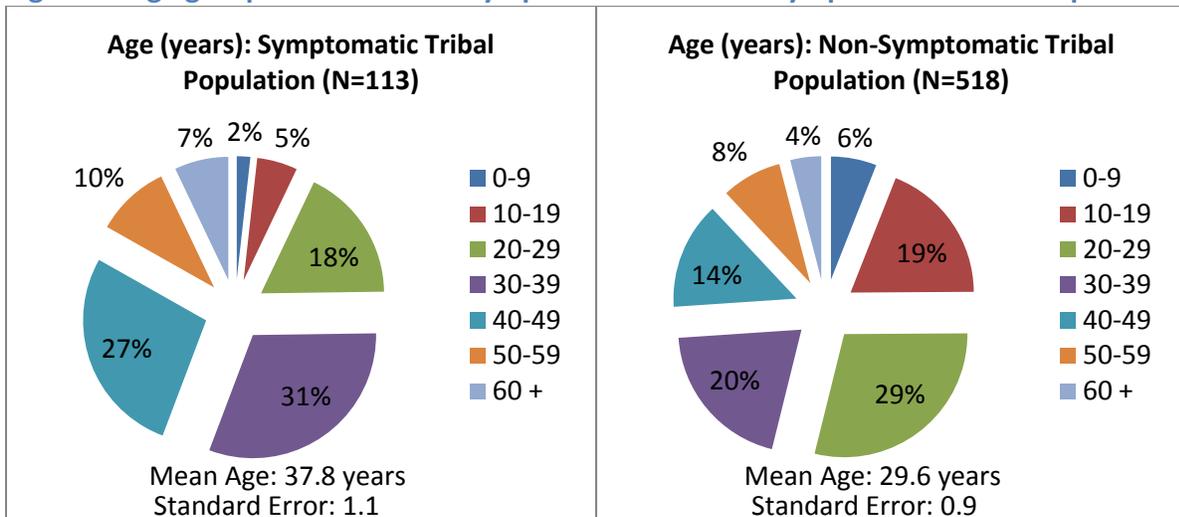


### 3.3 Profile of Symptomatic Persons

The detailed survey questionnaire included the information on background characteristics of symptomatic persons such as age, literacy, and occupation. An effort has been made to find the possible factors which could relate to the prevalence, accessibility and utilization of TB control services.

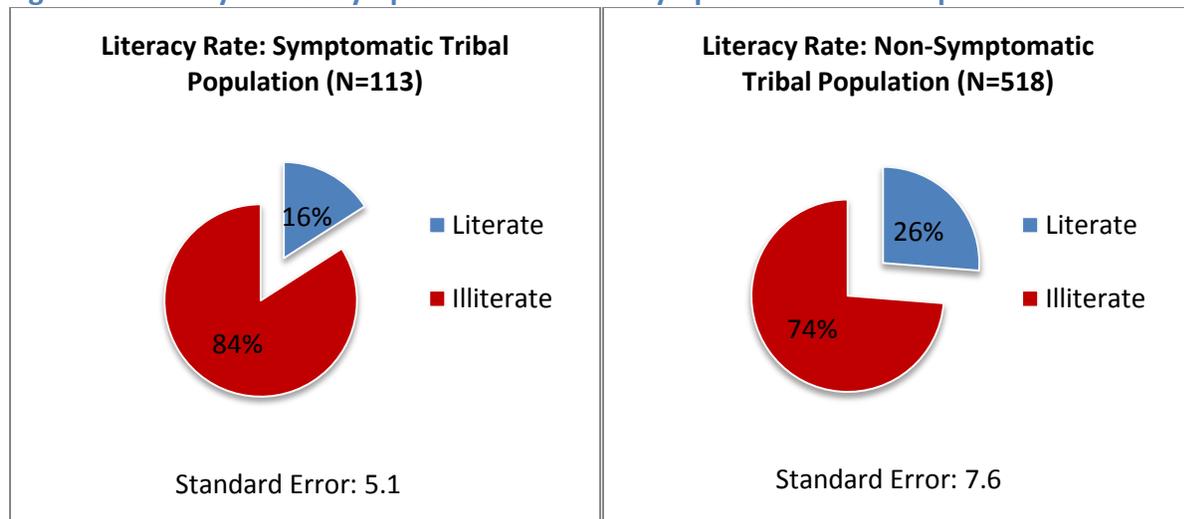
Figure 6, 7, 8 presents the socio demographic profile of the symptomatic persons. An analysis of the data indicating the key differences among symptomatic and non-symptomatic persons is also presented wherever the data is available.

**Figure 6: Age group distribution of Symptomatic and Non-Symptomatic Tribal Population**



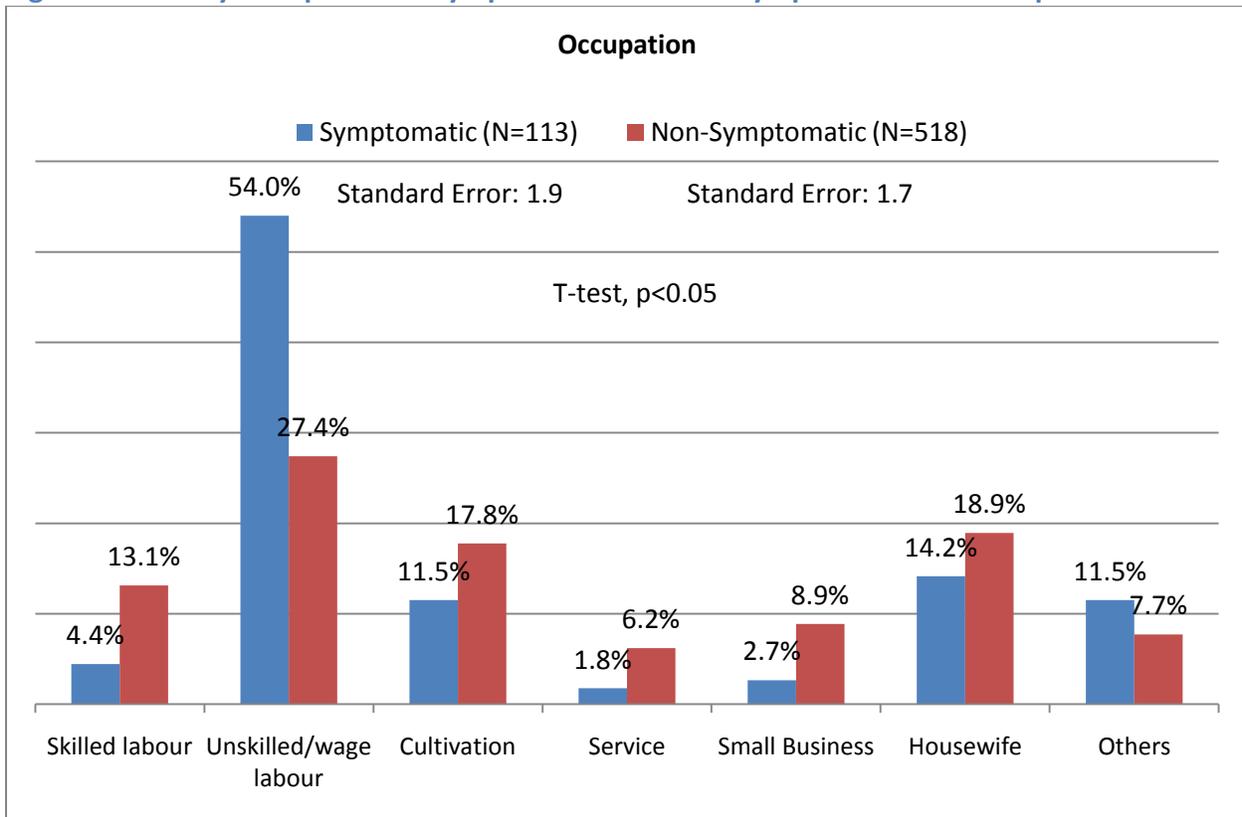
T-test,  $p < 0.05$

**Figure 7: Literacy rate of Symptomatic and Non-Symptomatic Tribal Population**



T-test,  $p > 0.05$

**Figure 8: Primary Occupation of Symptomatic and Non-Symptomatic Tribal Population**



The age analysis shows that the occurrence of symptoms increases with age up to 39 years and thereafter recorded a gradual decline. The mean age of the symptomatic persons was found to be 37.8 years. For non-symptomatic persons, the mean age was found to be fairly less, further substantiating that people in between 25-50 years of age are at a higher risk of being infected by TB.

Over three-fourths of both symptomatic and non-symptomatic persons were illiterate. The literacy level among the symptomatic population was recorded the lowest (16%). The level of literacy was higher by 10% among the non-symptomatic persons compared to the symptomatic persons. However after testing for significance, it is not evident that literacy rate is a significant factor among both groups.

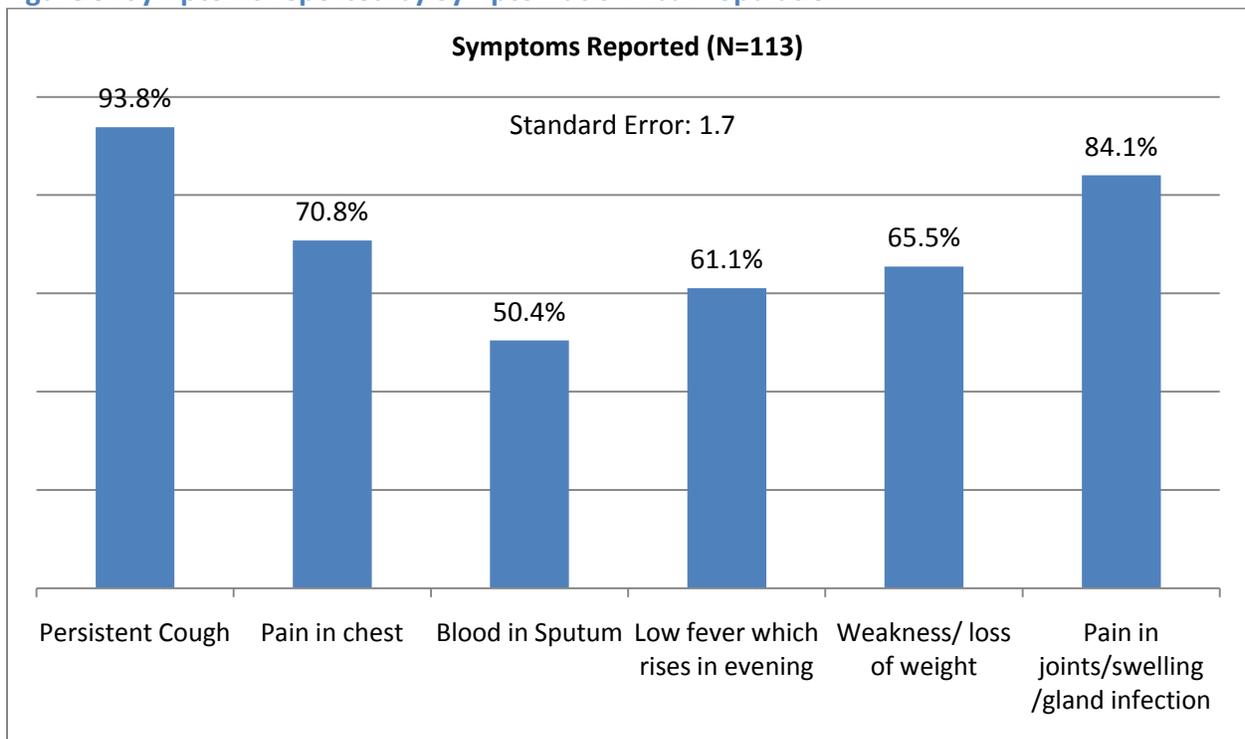
The surveyed population was asked about their occupation, in which they are mostly engaged. The difference with respect to occupation was more pronounced in 'unskilled/wage labor' – primary occupation of over half of the symptomatic population was daily wage labor compared

to only one fourth of non-symptomatic population. This data gives a significant indication of higher levels of transmission among unskilled workers.

### 3.4 Symptoms Reported By Symptomatic Persons

Figure 9 gives the distribution of symptomatic persons identified at the time of the survey according to the symptoms reported by them. The majority of them (94%) reported persistent cough for more than three weeks followed by pain in joints/ swelling glands (84%), pain in chest (71%), feeling weakness and loss of weight since last three weeks (66%), low-grade fever with rise in the evening time (61%) and blood in sputum (50%).

**Figure 9: Symptoms reported by Symptomatic Tribal Population**



It is interesting to note that a very high percentage of symptomatic persons reported having pain in joints/swelling/gland infection. When the DTO looked at this data, he thought it was apt as there were a considerable number of patients from this region who were diagnosed with Bone TB. Though this type of TB is very rare in occurrence - about 10 to 20 percent of all diagnosed cases of tuberculosis infect the bones<sup>20</sup>.

### 3.5 Accessibility of Services

The emphasis of TB control program was to improve the accessibility of services by strengthening facilities for diagnosis and treatment in the region. Symptomatic persons were asked questions relating to the accessibility and availability of health services in terms of distance travelled for diagnostic and treatment and waiting time to meet health providers. This information has been analyzed and illustrated in Figures 10, 11 and 12.

**Figure 10: Distance to Diagnostic services for Symptomatic Tribal Population**

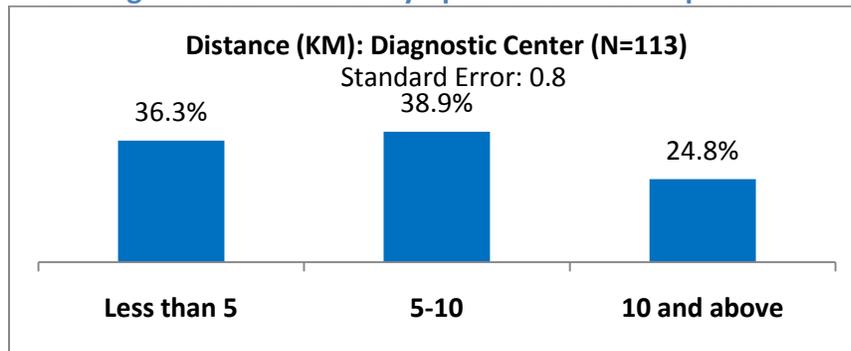
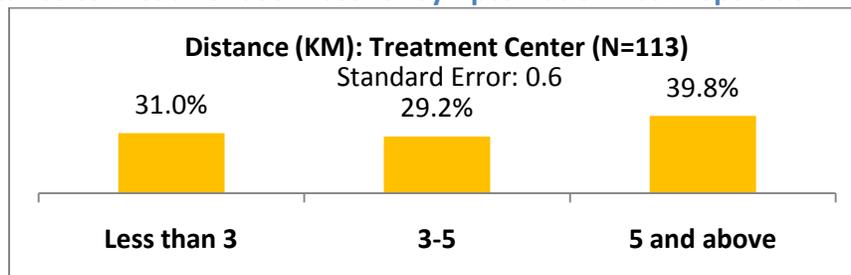


Figure 10 shows that though majority of the symptomatic persons reported the availability of diagnosis facilities within a distance of under 10 km, due to the 25% of symptomatic persons reporting a very long distance in the ranges of 20-30 km. This reveals a need for improving implementation of mobile diagnostic units to provide services to this distantly located tribal people.

Similarly respondents were asked about the distance travelled by them to avail the treatment after diagnosis. Figure 11 indicates that a significant 40% had to travel over 5km to a treatment center.

**Figure 11: Distance to Treatment services for Symptomatic Tribal Population**



Respondents were asked for the waiting time to meet the doctor, laboratory technician and other health staff during their visit to the health facilities. Over two-thirds of the respondents reported the waiting time to meet doctor between 10-30 minutes to seek treatment for tuberculosis. In case of laboratory technicians less than two-thirds of the respondents reported the waiting time to meet laboratory technician between 10-30 minutes which is longer than waiting time for a doctor. The respondents were also asked about the time spent waiting for other health staff and the average wait time of 15.6 minutes was reported by them.

**Figure 12: Waiting Time for Services**

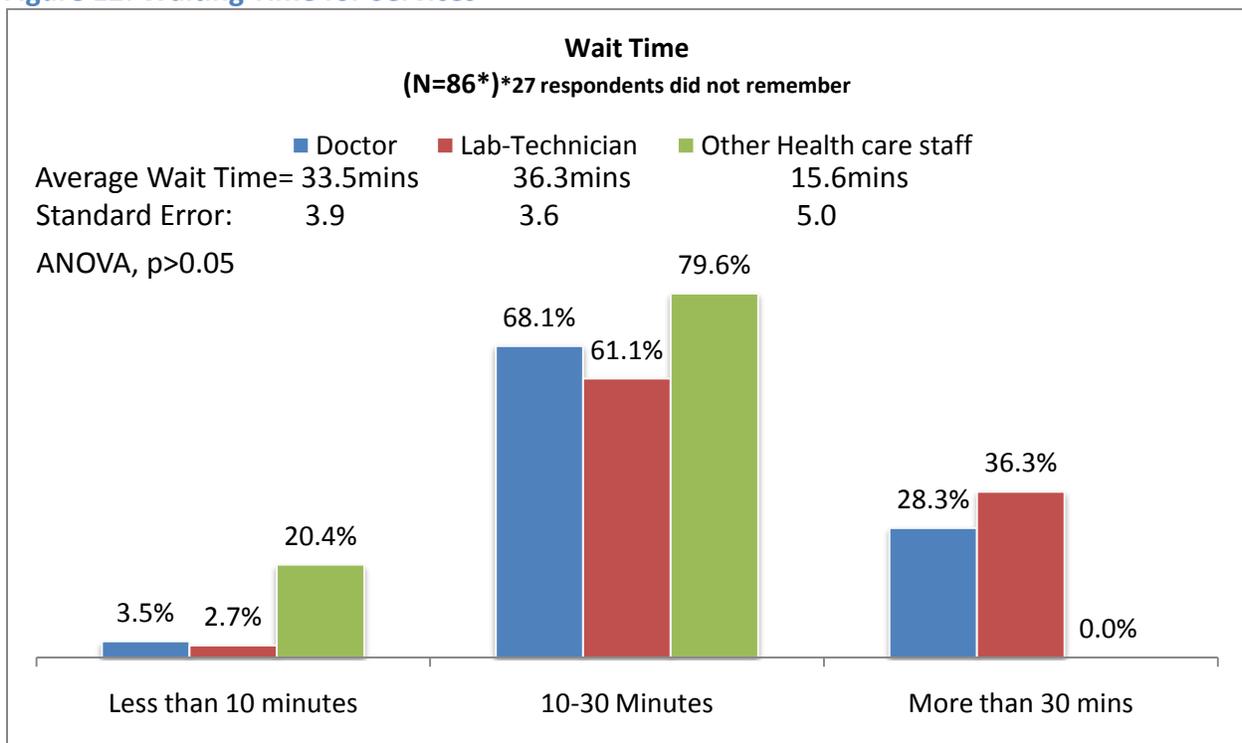


Figure 12 depicts the variations between average waiting time to meet the doctor, laboratory technician and health provider. It is clear from the figure that waiting time to meet lab-technician is relatively higher than doctor and other health staff. This could be due to lack of number of trained technicians and possibly lack of lab equipment that is hindering the overall performance of the program. However, after significance analysis, it is found that more research and data is needed before drawing conclusion.

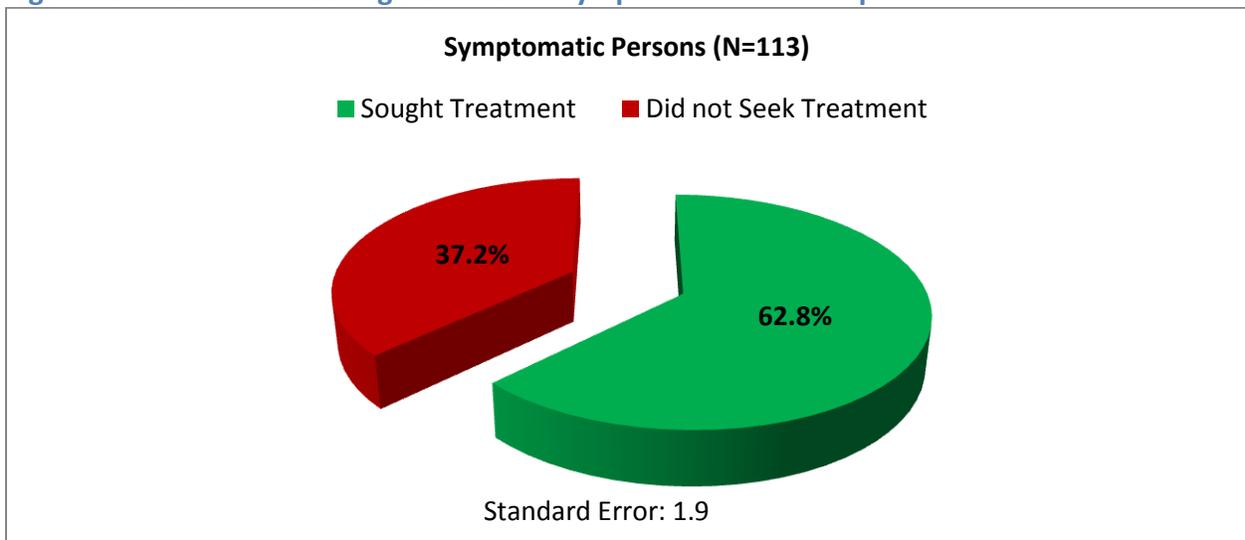
## Chapter 4. Treatment seeking incidence for Symptomatic persons

This chapter provides the information on treatment seeking behavior of the respondents. The information was obtained by extracting the responses to the treatment seeking behavior module from the survey questionnaire on whether they sought treatment, place of treatment, advice given for diagnosis and treatment and the reasons for those who have not sought treatment.

### 4.1 Treatment Seeking Behavior

Figure 13 shows that the majority of the symptomatic persons (63%) reported to have sought treatment. However, the symptomatic population that did not seek any treatment is also overwhelmingly high (37%).

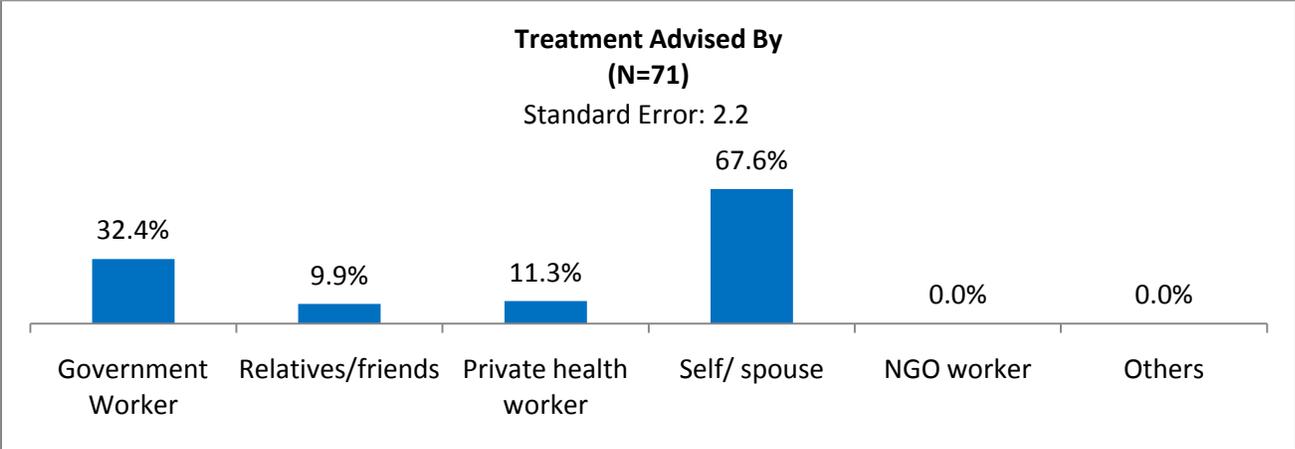
Figure 13: Treatment Seeking Behavior of Symptomatic Tribal Population



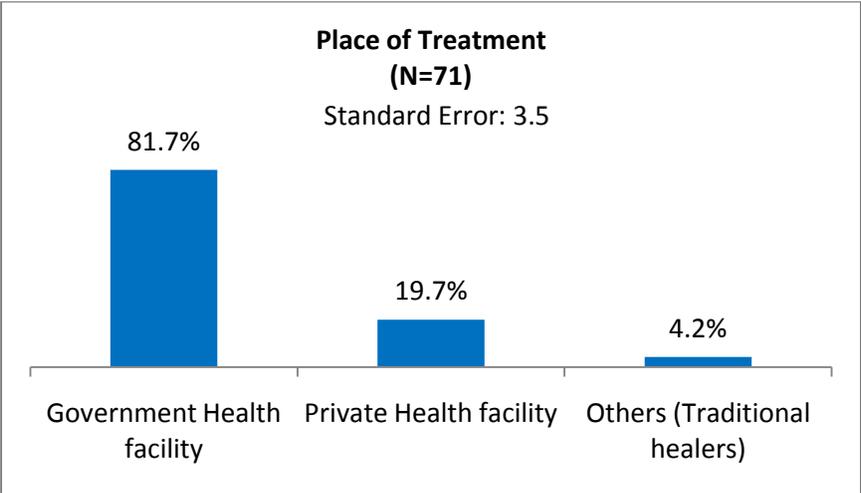
For the reasons given for why they sought treatment, more than half of the respondents (68%) reported as 'self/spouse' followed by 'government worker' (32%) and 'private health worker' (11%). It is interesting to note that although the government is spending significant effort in encouraging people to seek treatment, most of the motivation to seek treatment comes from within the family. A key takeaway here is to channel the government efforts to educate families on symptoms and the dangerous nature of this disease and further aid in self-motivation to seek treatment.

The respondents were also asked about the place of seeking treatment. It is evident from the data that government health facility (82%) is the main source for seeking treatment followed by treatment at private health facilities (20%). It was encouraging to note that only 4% sought treatment at unqualified practitioners, traditional healers etc.

**Figure 14: Source of advice for Treatment**



**Figure 15: Place of Treatment**



In order to draw conclusions on why a higher percentage of people sought treatment at government health facility, it is important to research the costs involved in obtaining treatment at all these facilities. Though this was an initial measurement in the study, due to time limitations, the data was not obtained.

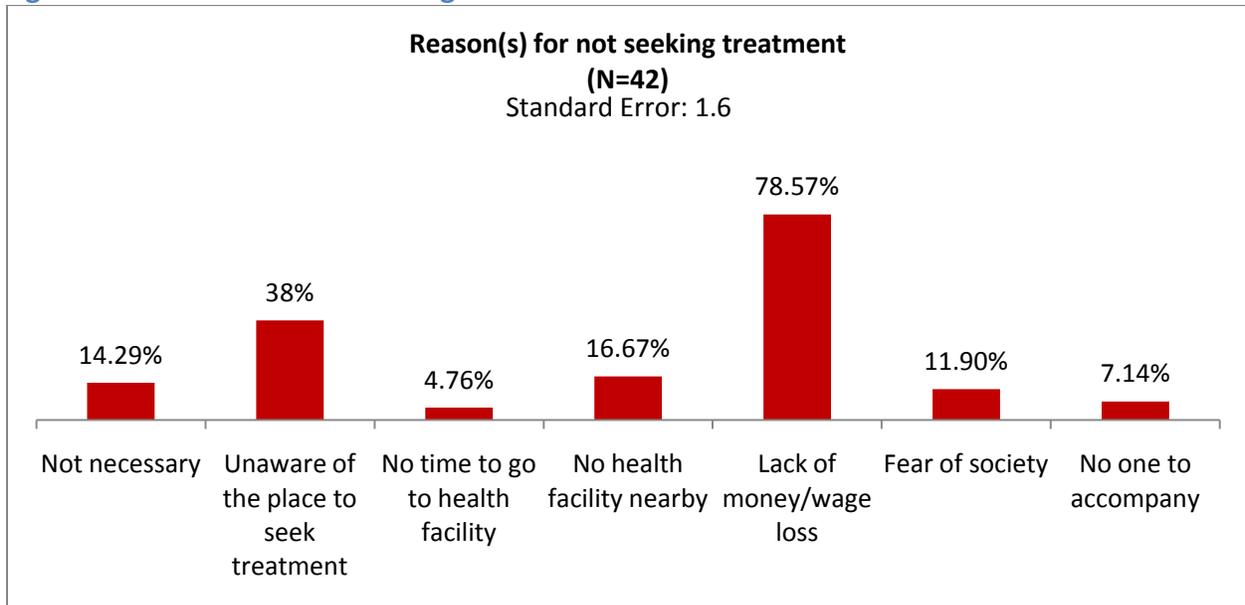
## 4.2 Reasons for Not Seeking Treatment

Figure 16 gives the distribution of reasons for not seeking treatment for symptomatic persons. 63% of the symptomatic population sought treatment and the reasons for the (37%) who did not seek treatment have been analyzed.

The major reason for not seeking treatment was reported as 'lack of money' (77%) followed by 'unaware of the place of treatment' (38%) and 'no health facility nearby' (17%).

Currently, according to the DTO, there is a travel reimbursement plan in place to cover the travelling expenses of the patients seeking treatment at government health centers. However, from interpretation of the data, there is a possible indication that travel reimbursement alone might not motivate the patient to seek treatment. A stronger monetary incentive to compensate loss of wage could be encouraging for the patients to seek treatment for TB. The number of observations is also too small in some of the responses, so interpretation of the results should be done with caution.

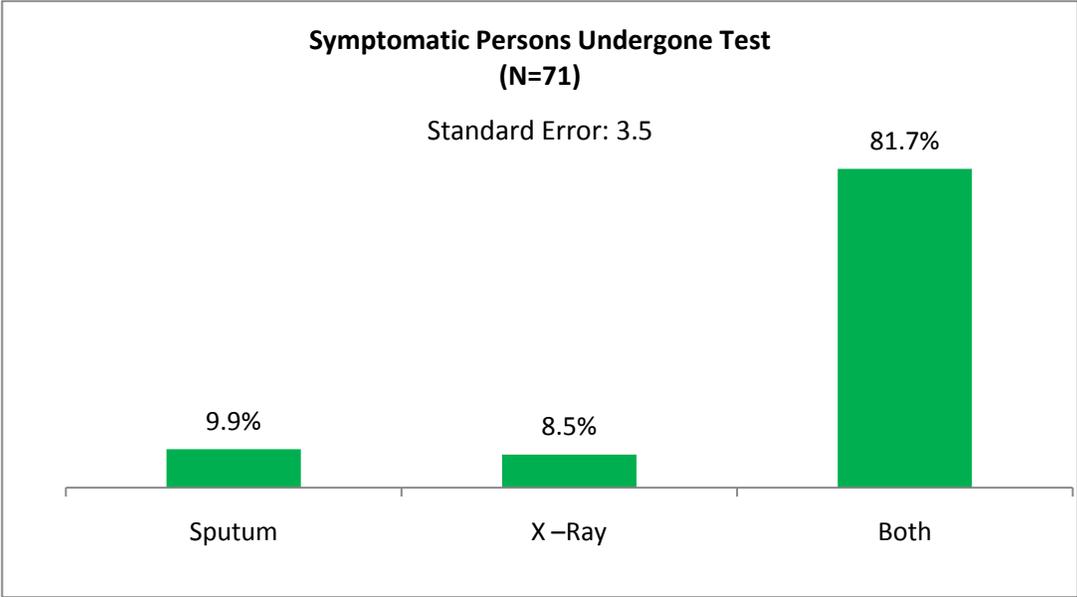
Figure 16: Reasons for not seeking treatment



### 4.3 Treatment Management

Symptomatic persons who visited government health facilities were given advice for treatment and the information has been analyzed and presented in the Figure 17. Over 80% of the symptomatic persons were advised for both tests and medicines. 20% of the symptomatic persons were advised medicines in the government health facility. 82% of respondents have undergone both sputum test and X- Ray examination as per the advice of the health providers.

**Figure 17: Symptomatic persons who visited government health facility and advised for treatment**



It is encouraging to find that over 80% of respondents reported seeking both tests for diagnosis. This is possibly because most reported sought treatment at a government facility where the treatment services are free. In future research, understanding if there is a correlation between the tests sought by symptomatic persons and the place of test would help in concluding whether or not the free treatment scheme is the prime factor for seeking both the tests.

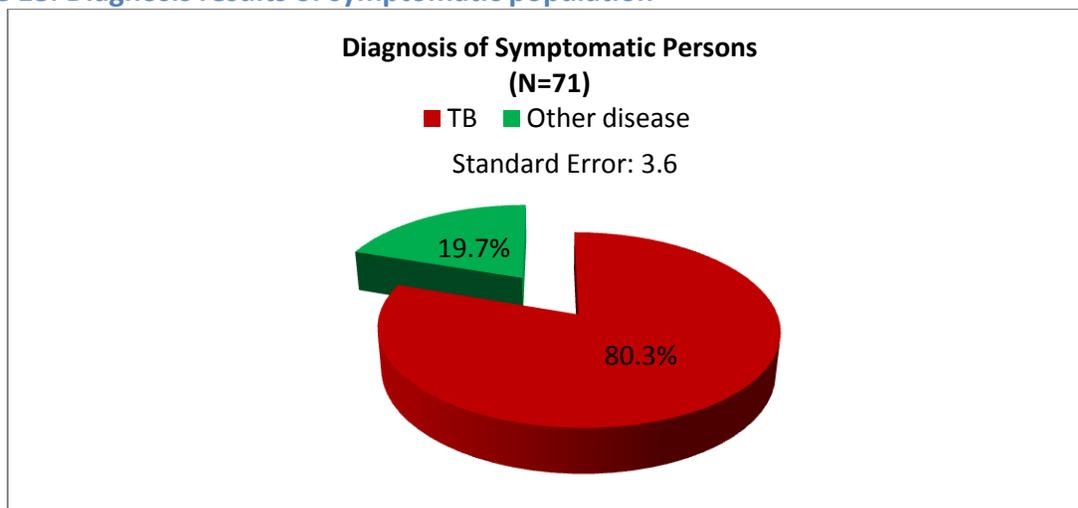
## Chapter 5. Treatment utilization by Symptomatic persons diagnosed with Tuberculosis

This chapter provides information on utilization of TB control services by the symptomatic persons diagnosed with TB. The data has been extracted from the responses of symptomatic persons to the questions in 'Treatment utilization in persons diagnosed with TB' module and analysis has been done on the result of diagnosis, treatment seeking behavior of confirmed TB patients and major reasons for not seeking treatment or discontinuation.

### 5.1 Results of Diagnosis of Symptomatic Persons

Figure 18, 19, 20 give the distribution of symptomatic persons who have undergone the diagnosis for Tuberculosis, promptness in availing treatment and reasons for those who did not seek treatment. The results given in Figure 15 indicate that about 80% of symptomatic persons surveyed were diagnosed with TB. This provides a good indication of prevalence of TB in these tribal areas and the need for significant efforts from government in reducing and containing the spread of TB.

**Figure 18: Diagnosis results of symptomatic population**

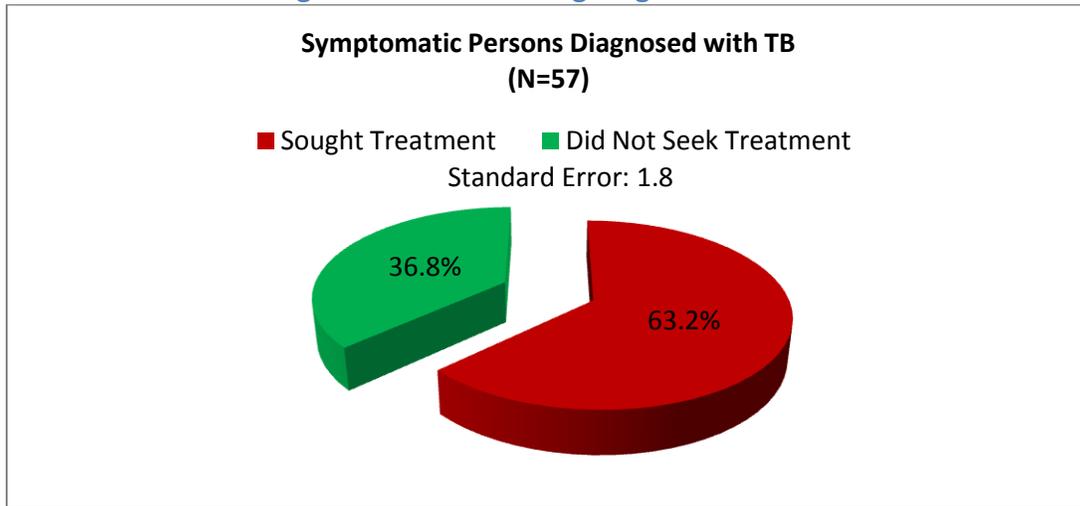


Also, this data is in line with the occurrence of TB among tribal people (81%)<sup>19</sup> in the state of Andhra Pradesh as per the statistics of TB control board of India.

## 5.2 Treatment after Diagnosis of Tuberculosis

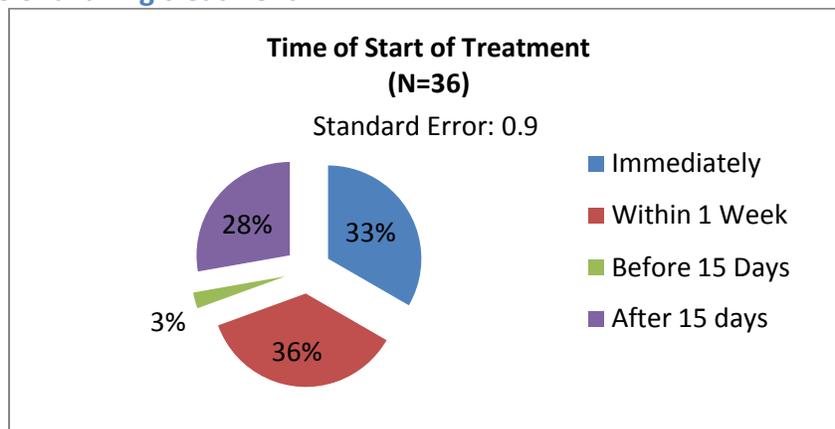
The majority of symptomatic persons (63%) diagnosed with tuberculosis sought treatment. However, in spite of the free health services provided, a significant percentage of TB diagnosed population (37%) did not seek treatment.

Figure 19: Treatment seeking behavior after being diagnosed with TB



The respondents were asked about the time, which elapsed before they started the treatment. More than 60% of the persons started treatment within a week after diagnosis. Interesting note here is that substantial number of respondents (28%) sought treatment after 15 days of diagnosis. This raises a cause for concern as most of the tribal population live in close quarters in these areas and the infection can be easily spread around without following proper treatment regimen.

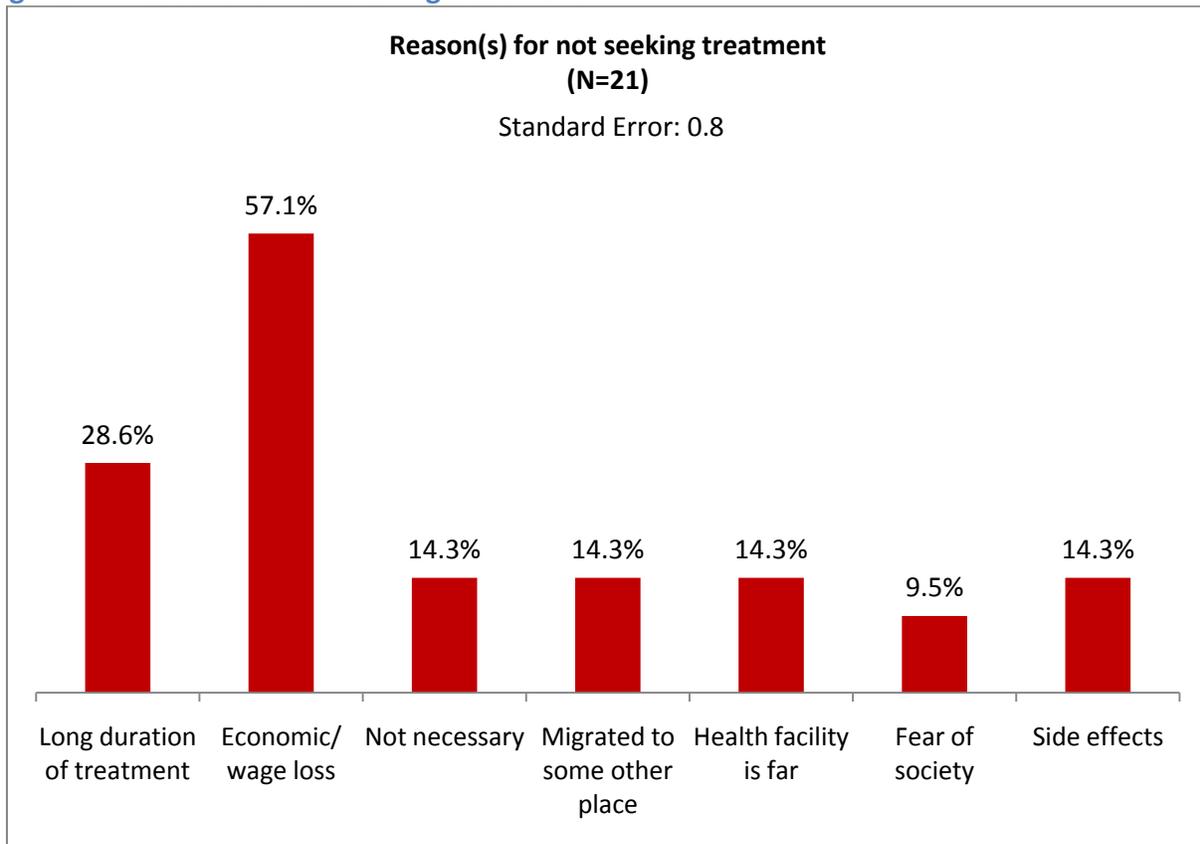
Figure 20: Time of availing treatment



### 5.3 Reasons for Not Availing Treatment

Overall 37% of symptomatic respondents did not start treatment. Though sample size is too small to allow region wide comparisons, the main reasons cited for not starting the treatment were 'economic problems/wage loss' (57%), 'long duration of treatment' (29%), 'not necessary' (14%) and 'health facility is far' (14%). The result should be interpreted with caution, as observations in some of the response sample sizes are small.

Figure 21: Reasons for not availing treatment



It is interesting to note a common pattern on the most popular reason cited by both symptomatic persons and persons diagnosed with TB for not seeking treatment is predominantly lack of finances. Though the government has free treatment and travel reimbursement scheme in place, the primary reason for not seeking treatment is loss of wage. This can be mitigated either compensating wage loss or taking the treatment to the tribal populations using mobile treatment centers.

## Chapter 6. CONCLUSIONS AND RECOMMENDATIONS

The study was undertaken to examine the barriers to accessibility of TB control services by tribal people in Visakha agency region with the support of Visakhapatnam District Tuberculosis Division, Government of India. The objectives of the study were

1. To collect and analyze data on the accessibility and utilization of different components of TB control services by the tribal population in Visakha Agency Area.
2. To understand the relationship between accessibility and various factors such as socioeconomic status, educational level, and working status.
3. To identify and document the reasons / barriers to utilization of the TB control services by tribal population.
4. To suggest alternatives/options based on the findings, which would help in modifying policies or components of program implementation to equitable accessibility of services to this group of community.

### 6.1 Findings and Recommendations

- The occurrence of symptoms increased with age up to 39 years. People living in tribal areas of Visakha agency region in between 25-50 years of age are at a higher risk of being infected by TB than their younger counterparts.
- Overall, 84% of the symptomatic persons were literate. The literacy level among non-symptomatic persons was higher (26% vs. 16%).
- The primary occupation for the symptomatic persons was unskilled/daily wage labor (54%) compared to only 28% of non-symptomatic population. Possible indications of higher levels of transmission among unskilled workers.

*This suggests that TB control services in tribal area and especially the villages concentrated with unskilled/wage labor group should be strengthened. Also, extending services to the workplace where these marginalized people work can have a positive impact in preventing the spread of TB. Awareness campaigns need to be designed separately for tribal areas keeping in view their*

*cultural values, level of education, their level of comprehension and the efficacy in the given setting.*

- Most commonly reported symptoms by symptomatic persons were persistent cough for more than three weeks followed by pain in joints – possibly indicating a higher risk of Bone TB in these regions.
- Nearly 1/4<sup>th</sup> of symptomatic persons reported the availability of diagnosis facilities as far as 30 km. On an average, Symptomatic persons have to travel 10.2 km to reach health facilities for diagnosis services.
- 59% of symptomatic persons received treatment within a distance of 5 km and remaining in the range of over 5 km. However, the average distance was found to be only 4.6 km.
- Over two-third of the respondents reported the waiting time to meet doctor between 10-30 minutes to seek treatment for tuberculosis.
- Average waiting time for laboratory technician reported by symptomatic person was highest (36.3 minutes) a little more than doctor (33.5 minutes). The variation indicates possible lack of number of trained technicians in this region.

*The accessibility and availability of services in the villages that are far away from diagnostic centers need to be improved by introducing mobile diagnostic units. Area specific strategy should be formulated to improve the accessibility and availability of health care services in these areas. The number of Direct Observation Treatment centers per population needs revision in the areas of high tribal concentration. This is necessitated due to location of these villages which are remote, geographically difficult and inaccessible.*

- Symptomatic persons, who were advised to seek diagnosis/treatment but did not seek any treatment is overwhelmingly high (37%).
- More than half of the respondents (68%) have reported seeking treatment after advice from self/spouse followed by 'government worker' (32%).

*The emphasis has to be made to promote the need for treatment, diagnosis from a qualified person, completion of treatment and observe necessary precautions while on treatment.*

- 82% of the respondents visited government health facility to seek treatment followed by private health facilities (20%). It was encouraging to note that only 4% sought treatment at unqualified practitioners, traditional healers etc.
- The occurrence of tuberculosis among tribal population in Visakha agency area was found to be extremely high – 80%
- Majority of symptomatic persons diagnosed with tuberculosis (80%) sought treatment. However, in spite of the free health services provided, a significant percentage of TB diagnosed population (37%) did not seek treatment.
- More than 60% of the persons started treatment within a week after diagnosis. Interesting note here is that substantial number of respondents (28%) sought treatment after 15 days of diagnosis raising cause for concerns.

*There is a need to strengthen the program focusing on the early diagnosis and start of treatment after diagnosis and general information about TB control program. In general the awareness level of tuberculosis patients needs to be upgraded in order to follow the correct treatment under TB control program.*

- The major reason reported by symptomatic persons for not seeking treatment was 'lack of money' (77%) followed by 'unaware of the place of treatment' (38%) and 'no health facility nearby' (17%).
- Main reasons cited by TB diagnosed symptomatic persons for not starting the treatment were 'economic problems/wage loss' (57%), 'long duration of treatment' (29%), 'not necessary' (14%) and 'health facility is far' (14%).

*In spite of the free treatment services provided by the government, the primary reason for not seeking treatment is under par financial situation of the population in this region. An incentive plan needs to be designed to provide the symptomatic person seeking treatment with sufficient funds to compensate loss of daily wage.*

## **6.2 Current Incentive Plan for Tribal Population and need for a New Plan**

According to the DTO, the government currently has only one financial incentive for the tribal people seeking treatment at government health centers – Providing travel reimbursement. However, the DTO has also reported that there is a better incentive plan for health workers and doctors treating tribal patients in this region (details not provided as the scope of this study is not extended to evaluating performance indicators of health care providers).

This study found the likely reasons for lower levels of treatment seeking and utilization behavior displayed by Tribal population in the Visakha Agency Region, the predominant reason being lack of financial ability/wage loss. The travel incentives provided in this program did not relieve much of the financial burden to patients of accessing TB care. Since a significant number of respondents stated wage loss as the primary reason for not seeking treatment, compensating tribal people seeking treatment for loss of wage could result in a strong improvement in treatment seeking incidence.

An alternative for this incentive could be introduction of mobile diagnostic and treatment centers to reach the tribal people at their place of work. For a practical implementation, a feasibility study needs to be done between financial implications of incentives compensating wage loss vs. cost and operational expenses of a mobile center.

For future research, the scope of this study needs to be extended in the direction of findings from this study with a focus on obtaining financial data such as annual income of the tribal people. Furthermore, operational issues of incentives have to be well-designed, developed, and field-tested before being introduced on a large scale. Strategies to address health system and TB program issues should be implemented before or at least alongside financial incentives.

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## Appendix: Survey Questionnaire

### Questions

#### Demographics and Economic profile

Age of the person (in completed years)

Sex of the person.

Marital status

Education

Main occupation of the person

What is the primary source of income?

Type of house (observed)

### Coding Category

1. Male
2. Female
1. Married
2. Unmarried
1. Literate
2. Illiterate
1. Skilled labour
2. Unskilled/wage labour
3. Cultivation
4. Service (specify)-
5. Petty Business
6. Business (specify)-
7. Student
8. Unemployed
9. Housewife
10. Not applicable (children and old)
11. Other (specify)-
1. Wage labour
2. Cultivation
3. Service (specify)-
4. Small business (specify)-
5. Business (specify)-
6. Others (specify)-
99. No response
1. Hut (thatched)
2. Kachcha
3. Semi-pucca
4. Pucca

### Identifying Symptomatic Persons

- Is anybody in your household getting persistent cough for more than 3 weeks?
1. Yes
  2. No
- Is anybody in your household having chest pain for more than 2 weeks?
1. Yes
  2. No
- Does anybody in your household have blood in sputum?
1. Yes
  2. No
- Is anybody in your household having a low grade fever for last more than 15 days?
1. Yes
  2. No
- Is anybody in your household feeling weak and loss of weight since last three months?
1. Yes
  2. No
- Has anybody in your household been taking or initiated any medical treatment during the last six months?
1. Yes
  2. No
- What are the symptoms reported?
1. Persistent Cough
  2. Chest Pain
  3. Blood in sputum
  4. Low grade Fever
  5. Loss of weight / weakness

### Accessibility and Treatment Seeking Behavior

Did any health worker visit you in the last six months?	1. Yes 2. No
Have you mentioned the health worker about these problems?	1. Yes 2. No
Did the health worker advise you to go to health centre for this problem(s)?	1. Yes 2. No
If not did anyone else advice you to seek treatment?	1. Government Worker 2. Relatives/friends 3. Private health worker 4. Self/ spouse 5. NGO worker 6. Others
What is the approximate distance to diagnostic center?	
What is the approximate distance to treatment services?	
What is the approximate wait time for services?	
a. Doctor	
b. Lab-Technician	
c. Other Health care staff	
What test(s) were you advised for?	Sputum X-ray
Did you get your test(s) done?	1. Yes 2. No
Where did you visit for the treatment of this problem?	1. Government Health facility 2. Private Health facility 3. Others (Traditional healers)
How many times tests were done?	1. Not necessary 2. Unaware of the place to seek treatment 3. No time to go to health facility 4. No health facility nearby 5. Lack of money/wage loss 6. Fear of society 7. No one to accompany
Why did you not get your test done?	

### Treatment seeking behavior in persons diagnosed with TB

- |   |                                 |
|---|---------------------------------|
| What was the diagnosis or test?                         | 1. TB                           |
|   | 2. Other                        |
| What was done after tests?                              |                                 |
|   | 1. Immediately                  |
| When did you start the treatment?                       | 2. Within 1 Week                |
|   | 3. Before 15 Days               |
|   | 4. After 15 days                |
| Why did you discontinue or did not start the treatment? | 1. Long duration of treatment   |
|   | 2. Economic/ wage loss          |
|   | 3. Not necessary                |
|   | 4. Migrated to some other place |
|   | 5. Health facility is far       |
|   | 6. Fear of society              |
|   | 7. Side effects                 |