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**Perception of TB Patients and Health  
Service Providers about Directly Observed  
Treatment, Short-course (DOTS)  
A Case from Tanahun District of Nepal**

Submitted to

**Department of Community Medicine and Family Health  
Maharajgunj Campus, Institute Of Medicine  
Tribhuvan University  
Kathmandu, Nepal**

**For the partial fulfillment of the requirements for the degree of  
Masters in Public Health (MPH)**

Submitted by

**Rishi Ram Parajuli**

**May 2000**



Approval sheet

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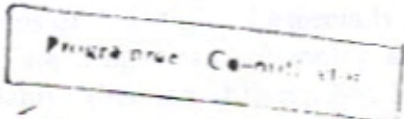
This thesis is prepared as partial fulfillment of the requirement of the degree of Masters in Public Health (MPH) from Tribhuvan University, Nepal. This thesis has been accepted and recommended for the final approval.

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# Acknowledgement

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## Summary

The objective of this descriptive study was to assess the perception of tuberculosis (TB) patients and health service providers about health institution and community based Directly Observed Treatment, Short-course (DOTS) program and it was conducted in Tanahun district of Western Nepal. Tanahun district was selected purposively for this study as it was the first district in Nepal implementing both community and health institution based DOTS programs within the same district in 1996.

All 4 TB treatment centers were selected for study, where total of 94 TB patients on treatment, 4 defaulters, 15 Female Community Health Volunteers (FCHVs) and 20 health workers from the 4 different TB treatment centers and 13 sub centers were interviewed. Data was collected using interview and observation methods as well as reviewing the records from the treatment centers. Interviewers were recruited locally for data collection in the study area. Data collection took place from Mangsir 20th to poush 20th, 2056 Bikram Sambat.

The service of DOTS program was not adequately covered in the district where only one Health Posts, 2 Primary Health Centers and one hospital were serving as TB treatment center for population of the whole district. Remaining 12 Health Posts and 31 Sub Health posts were partly supporting those 4 centers by doing Directly Observed Treatment (DOT).

Most of the respondents (TB patients) had good knowledge about tuberculosis and its treatment. Main source of TB related information for the respondents was health workers of the treatment centers. Proportion of respondents preferring community based DOTS program and health institution based DOTS program was almost same (52.1% and 46.8% respectively). More than 50% of the respondents had to spend more than 1 hour in travel to the nearest treatment centers. However, majority of the respondents preferred less than 10 minutes of time as their most acceptable time for the travel. Most (68.1%) of the respondents liked daytime as their convenient time for taking drug. Only 37.2% of the respondents had to wait in the treatment centers for treatment and the maximum of time to be waited by those patients in some visits was up to 30 minutes.

About 21% of the respondents had felt side effects of the anti-tuberculosis drugs and most of them were treated in their treatment centers. Behavior of the health workers was found good by

most of the respondents. High proportions of the respondents were fully satisfied both with the treatment supervisors and the services. Numbers of defaulters were higher in Bandipur Hospital than rest of 3 centers. Different reasons for defaulting from the TB treatment such as lack of faith with the treatment, feeling of wellbeing before the course is completed, perception of weakness due to drug and lack of proper knowledge about the actual duration of the treatment were identified.

Most of the health workers were satisfied with the tuberculosis program due to frequent training, meetings, observation visits, timely evaluation and monitoring system in the TB program compared to other programs. Most of the health workers preferred the health institution based DOTS than the community based DOTS program due to poor supervision system up to the community level to ensure the quality of DOT.

Most of the FCHVs involved in the DOTS program were found satisfied with the work they did. The main reason for satisfaction was successfully curing of the patients with their efforts. Most of the FCHVs liked to continue assisting in the DOTS program despite their personal problems and without any incentive.

## Abbreviations

AIDS	Acquired Immunodeficiency Syndrome
ARTI	Annual Risk of TB Infection
BCG	Bacillus Calmette Guiren
BNMT	Britain Nepal Medical Trust
BRAC	Bangladesh Rural Advancement Committee
CHV	Community Health Volunteer
DHO	District Health Office
DoHS	Department of Health Services
DOT	Directly Observed Therapy
DOTS	Directly Observed Treatment, Short- course
DTLA	District TB/Leprosy Assistant
GENETUP	German - Nepal Tuberculosis Program
HIV	Human Immunodeficiency Virus
HMG	His Majesty's Government
HSPs	Health Service Providers
INGO	International Non-Governmental Organization
IOM	Institute Of Medicine
IUATLD	International Union against TB and Lung Diseases
JICA	Japan International Co-operation Agency
LHL	Norwegian Heart and Lung Association
MDM	Medicine Du Monde
MDR	Multi -Drug Resistant
NATA	Nepal Anti- TB Association
NGO	Non-Governmental Organization
NORAD	Norwegian Government Aid
NTC	National Tuberculosis Center
NTP	National TB Program
NUFU	Norwegian University, Committee for Development, Research and Education
PHC	Primary Health Center
RTC	Regional TB Center
RTLA	Regional TB/Leprosy Assistant
SAARC	South Asia Association for Regional Co- operation
SCC	Short Course Chemotherapy
SEARO	South East Asia Regional Office
TC	Treatment Center
TEAM	The Evangelical Alliance Mission
TLM	The Leprosy Mission
TS	Treatment Supervisor
UNICEF	United Nation's Children Fund
UMN	United Mission to Nepal
VDC	Village Development Committee
WHO	World Health Organization
WRQCC	Western Regional Quality Control Center



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## 1. Introduction

### 1.1 Back ground

Tuberculosis (TB) is an infectious disease caused by microorganism called Mycobacterium tuberculosis. The microorganism usually enters the body by inhalation through the lungs. They spread from the initial location in the lungs to other parts of the body via the blood stream, the lymphatic system, via the airways or by direct extension to other organs. Tuberculosis, clinically, can be mainly divided into two-types: **1. Pulmonary tuberculosis** is the most common form of the disease, occurring in over 80% of cases. It is the only form of tuberculosis, which may be infectious and **2. Extra-pulmonary tuberculosis** is the tuberculosis affecting organs other than the lungs, most commonly pleura, lymph nodes, spine, joints, genito-urinary tract nervous system or abdomen. TB may affect any part of the body.<sup>1</sup>

#### Global epidemiology and burden of tuberculosis

Despite the fact that the causative organism was discovered more than 100 years ago and highly effective drug, vaccines and reliable diagnostic procedures are available making TB a preventable and curable disease,<sup>2</sup> TB remains a world wide public health problem. According to World Health Organization (WHO),<sup>3</sup> about one third of world's population is infected by Mycobacterium tuberculosis. Deaths from TB comprise 25% of avoidable deaths in the developing countries. 95% of TB cases and 98% of TB deaths are in the developing countries. 75% of TB cases in the developing countries are in the economically productive age group (i. e. 15- 49 years). More people are dying of TB today than ever before killing 8 thousand people a day, that is 2-3 million people each year. TB kills more people than Acquired Immunodeficiency Syndrome (AIDS) or malaria and it is also the biggest killer of young people and adults in the world. One third of the world population now are infected with TB. A TB case is likely to infect another 10- 15 people in just one year. TB accounts for one third of AIDS deaths worldwide. Human Immunodeficiency Virus (HIV) positive people are 30 times more likely to get sick with TB once infected. The deadly link between TB and HIV is a major factor, which can contribute to the spread of TB. During 1990's an additional 7 million cases of TB are predicted to become of dual HIV/ TB association.<sup>3</sup> WHO projected that, over one million women and 100,000 children will die needlessly from TB and hundreds of thousand of children will become orphan

this year (1999). As many as half of the world's refugees may be infected with TB and over 17,000 of them get sick with the disease.

Recognizing that TB is one of the most neglected health crises and that the TB epidemic is out of control in many parts of the world, in 1993 TB was declared by WHO to be a **Global emergency**.<sup>4</sup> WHO is working with the governments of the worst affected countries to help them establish effective TB control program. It encourages these countries to move toward nationwide coverage of TB as soon as possible. Most of these countries began by establishing demonstration and training areas of DOTS (Directly Observed Treatment, Short Course).

### **Tuberculosis in the South Asian Region**

The Southeast - Asia Region suffers from heavy burden of TB, nearly 40% of global TB cases and deaths are in the region. 95% of the TB cases are reported from Bangladesh, India, Myanmar and Thailand. In these countries, TB has been identified as one of the top most public health problem. The situation is likely to be further complicated with the rapid spread of HIV and emergence of multi drug resistant strain in the region. Nearly 60% of AIDS cases develop TB including that the latter is the most common life threatening opportunistic infectious association with HIV.<sup>5</sup>

### **TB in the South Asia Association for Regional Co- Operation (SAARC) countries**

In the 7 SAARC countries, with population of 1,240 million, there are 5 million TB patients, 3.1 million people develop the disease and 1 million deaths occur from TB each year. Nepal is privileged to host the SAARC Tuberculosis Center and is based at the National TB Center (NTC). The SAARC TB Center was established in 1991 and encourages co-ordination and communication between national TB programs in the SAARC countries.<sup>6</sup>

### **Tuberculosis in Nepal**

TB is the commonest cause of adult deaths in Nepal and kills approximately 10,000 people every year 4,000 of whom are women aged 15 to 49 years. The tragedy is that those are preventable deaths. Nearly 50,000 people develop TB each year and 22,000 of them have infectious TB. About 11,000 infectious cases are registered with the NTP, but only about half of this complete treatments<sup>7</sup>. It is estimated that 60% of the adult population in Nepal are already

infected with TB. In Nepal, the average Annual Risk of TB Infection (ARTI) nationally is 2.2%. Where there is variation in the hill districts, terai districts and urban areas (1.5%, 2.5% and 4% respectively). The majority of TB patients are in the economically active age group of 15 to 49 years of age and in men (2 to 3 male: 1 female) with the gender difference increasing with age. Of the 50,000 people<sup>8</sup> who develop TB annually in Nepal, about 52% were identified during Fiscal year 1998/99.<sup>9</sup>

### **History of TB control Services in Nepal**

Tuberculosis control service was first commenced in Nepal with the construction of 50 bed Tokha Sanatorium in 1934. The Central Chest Clinic in Kathmandu at Bir Hospital was started in 1951 where the facilities for diagnosis and domiciliary treatment were made available for TB patients. After 10 years of establishment, the chest clinic became a separate institution and was no longer the part of Bir Hospital. In 1951, Nepal Anti -TB Association (NATA) established and International Nepal Fellowship (INF) started TB treatment at Shining Hospital at Pokhara. In 1965, the TB control program was started with the support of WHO and UNICEF using BCG vaccination. In 1968, Britain Nepal Medical Trust (BNMT) started anti- TB activities in Koshi and Mechi zones of Eastern Nepal. During the course of the years, other NGOs/ INGOs such as United Mission to Nepal (UMN), Japan International Co-operation Agency (JICA), also were involved in the fight against TB. JICA started to work in 1973 constructing the Regional TB Center (RTC) in Pokhara and National TB Center (NTC) in Thimi, Bhaktapur. Which were completed in 1989. Both NTC and RTC started functioning since 1990.<sup>10</sup>

### **Organization of TB control services in Nepal**

The National Tuberculosis Program (NTP) is an integrated approach within the national health system to control TB. It has policies, plans, and activities to achieve good case finding and treatment of Tuberculosis patients. The NTP should be countrywide, continuous, permanent and integrated with the general health services. It should also be relevant to the needs of the population.

The director of the NTC manages the National Tuberculosis Center (NTC) and NTP. Staffs of NTC provide technical support to TB control activities at the national, regional and district levels, as well as running the referral clinic and laboratory at NTC. Technical support in areas of planning, monitoring, programming, training, supervision logistics, laboratory services, health

information education and communication, and research related to TB control is provided by the staff of NTC.<sup>11</sup>

A Regional TB/Leprosy Assistant (RTLA) supports the Regional Health Services Directorate in managing TB control activities in the region. In addition, the Regional TB Center in Pokhara provides technical support to TB control activities in the western region. A District TB/ Leprosy Assistant (DTLA) supports to the District Health Officer in the management of TB control activities in the district level. Diagnosis and treatment of TB is usually done in the hospitals and PHCs. health posts are used as treatment sub- centers. In many districts the Sub- health Posts are also used as treatment sub -centers for the DOTS.<sup>11</sup>

### **Organizations Assisting the NTP in Nepal**

**At the national level:** The NTP receives technical and financial assistance from the World Health Organization (WHO), Japan International Co- operation Agency (JICA), Norwegian Heart and Lung Association (LHL), Norwegian Government Aid (NORAD) and International Union Against Tuberculosis and Lung Disease (IUATLD). Several national and international NGOs are involved in the TB control activities in Nepal. The NATA has played an important role in controlling TB and has health education activities in 23 districts, and also being provided treatment services in seven districts. The following are the INGOs assisting the NTP Nepal.<sup>11</sup>

**At the Regional level :**

- Britain Nepal Medical Trust (BNMT)
- International Nepal Fellowship (INF)
- Netherlands Leprosy Relief Association (NSL)

**At the District level:**

- Medicine Du Monde (MDM)
- United Mission to Nepal (UMN)
- The Leprosy Mission (TLM)
- The Evangelical Alliance Mission (TEAM)
- German Nepal Tuberculosis Program (GENETUP)
- Friends of Shantabhawan (FoS)

### **What is DOTS?**

DOTS (Directly Observed Treatment, Short- course) is a strategy for ensuring that every patient who starts treatment gets the best chance of being cured. As part of the DOTS strategy, health workers or the trained supervisors counsel and observe their patients swallowing each dose of a powerful combination of medicines, and the health services monitors the patients' progress until

each is cured. Political and financial commitment and a dependable drug supply are essential parts of the DOTS strategy. The DOTS strategy focuses on the cure of every TB case. Good TB control, which cures patients has proven successful in preventing drug resistant in many countries.<sup>12</sup> DOTS is not simply watching a patient take their drugs but it also involves providing motivation, encouragement and follow-ups to the patients. DOTS is also not the solution to poor compliance, but it must include package of activities that will help patients to complete their treatment. Above all DOTS is not easy, it requires a commitment from health workers, patients and community. It is a way of providing the necessary support to the patient that will enable them to complete a full course of treatment. Without such support cure rates will be low and TB control will be not achievable.<sup>13</sup>

### **What is DOT (Directly Observed Treatment)?**

It is a strategy to ensure TB patients are cured, in which a person who is accountable to the health service observes the patient taking their medicine properly in right combination and for the correct duration providing him/her with the information and encouragement he needs. DOT is one of the five components of the DOTS strategy.<sup>13</sup>

### **Implementation of DOTS in Nepal**

In Nepal, four pilots sites started implementing DOTS in 1996 with an expansion to further treatment centers undertaking following the excellent results at the pilot sites. So far there are 111 DOTS treatment centers in the country. Cure rates in cases treated in 1997/98 at DOTS centers was 86%. Further expansion of DOTS is planned for the year 2000 with the target of covering the whole country.<sup>14</sup>

### **1.2 Statement of problem**

TB is a major public health problem in Nepal. There have been many efforts to control this disease from the government, Non- government, and private sectors but TB still remains as a major threat. From the government sector, the National TB Program (NTP) is functioning extending its services in all 75 districts of the country through the general health services of His Majesty's Government (HMG). The goal of NTP is to reduce the mortality, morbidity and transmission of TB to such a level that it is no longer a public health problem. In order to attain the goal, NTP has set objectives of achieving 85% of cure rate and 70% of the case finding rate of the sputum smear positive patients.<sup>15</sup>

Various experiences in the different parts of the world have shown that it is not possible to achieve 85% cure rate of TB treatment without implementing DOTS. A similar problem exists in Nepal. According to the recent NTP annual treatment outcome report, cure rate in the DOTS implemented area of Nepal was 86% whereas the results of all new sputum positive TB cases treated (DOTS and non-DOTS combined) was only 68%. According to the NTP's 5-year plan (1995-1999) it is targeted to cover all 75 districts with DOTS by the year 2000 and so far 45 district of the country has been covered (partially). Of those DOTS programs most of them are located in terai and urban areas of the country. The challenge to the NTP now is how to expand and cover with the DOTS in the rest of the hard to access areas of the country.<sup>16</sup>

The TB patients after diagnosis are registered for treatment but not all of them complete their treatment and get cured due to defaulting, transfer out, treatment failure or death. Of them the defaulting is the major problem in Nepal. The NTP has set target to achieve and sustain a cure rate of 85% by the year 2000 AD. But to achieve this target, there are number of affecting factors involved. One of those factors is high defaulter rate and is considered to be a major one. According to the annual treatment outcome report (1997/1998) of NTC the rate of defaulters in DOTS implemented districts and the districts without DOTS (both new sputum positive and the re-treatment patients combined) of Nepal was 7.5% and 11.7% respectively.<sup>14</sup>

Emergence of drug resistant- TB is a serious concern for many developing countries like ours. The most important cause of multi drug resistance is due to patient's non- compliance to treatment. According to NTP, 5% of new cases of TB and 55% of re-treatment cases are resistant to at least one TB drug<sup>15</sup>. In a sentinel site study carried out in 1996, 90% of 787 patients tested were fully sensitive and 1.1% had multi drug resistance.<sup>17</sup>

In the DOTS strategy, somebody must supervise treatment of TB patient at least for first 2 months of their treatment in the health facilities or in the community. In most of the DOTS centers TB patients should come to the health facility for DOT no matter whatever walking distance he/she may have to travel. There are limited places where other options with easier access for the TB patients for their treatment are available in Nepal so far.

In Nepal, DOTS was started first in 1996 with 4 demonstration and treatment centers in 4 different places of the country (Bhaktapur, Nawalparasi, Parsa and Kailai). So far, there are 111 DOTS treatment centers in 45 districts of Nepal covering about 50% of the total population of the country.<sup>18</sup>

Due to difficult terrain, low literacy rate, lack of transportation and communication and poor distribution of health infrastructure, DOTS has been difficult to implement particularly in the hard to access areas (i.e. hills and mountainous areas) compared to terai and urban areas in Nepal. Considering this, NTP of Nepal has given one of the main priorities for research to identify appropriate ways to implement DOTS in such areas effectively.

### 1.3 Rationale of the study

According to World Health Organization, DOTS is a proven effective strategy of best TB treatment achieving good cure rate. Many scientists, TB specialist, national program managers and international organization have made efforts to find out an effective strategy of TB treatment like DOTS. WHO has played a major role to implement DOTS in its member countries including Nepal. The DOTS strategy has wider options depending upon socio-cultural factors, geography, and economic status and health infrastructure of a country or a community. The present success with DOTS has been achieved in the districts, which have high population density and easy access to health services. This is not typical of most of Nepal, and methods of supervising treatment in areas where access and the health care information is poor have to develop.<sup>19</sup>

In Nepal, DOTS was first introduced in 1996 after developing standard criteria to expand it gradually in new areas. At the beginning, four demonstration and training centers were established. All these demonstration centers showed good results and much experience to implement DOTS in the rest of the country in phase wise manner. So far, DOTS has been implemented in 111 centers of 45 districts achieving more than 85% of cure rate.<sup>20</sup> The DOTS programs were expanded gradually by NTP in the different parts of the country since the beginning of the implementation. They are mainly sited in the terai and urban areas. As a result, cure rate in those areas has been achieved more than 85%. According to the 5-year plan of NTP it is targeted to complete covering the whole country by the year 2000 AD. But, the question still remains that how to expand DOTS in the hard to access area and in the hilly areas of the remaining part of the country. Therefore one of the research priorities of NTP has been to identify solutions for developing appropriate strategies for expansion of DOTS in those areas in the future. Considering this, I selected the topic Perception of Patients and health Providers about Directly Observed Treatment, Short-course (DOTS): A Case from Tanahun District of Nepal.



## **1.4 Research questions**

- How is the general situation of the DOTS program in the Tanahun district at present?
- How do the TB patients and defaulters perceive about the community based DOTS program and health institution based DOTS program?
- Which of the two different DOTS programs is more appropriate in terms of patients' convenience?
- How do the health service providers perceive about the community based DOTS and health institution based DOTS programs in terms of feasibility and convenience for them?
- Do the patients opt for the alternative approaches of DOTS?
- Do the health service providers opt for the alternative approaches of DOTS?

## **1.5 Objectives**

### **1.5.1 General objective**

To assess the perception of service providers and TB patients about community based and health institution based DOTS programs.

### **1.5.2 Specific objectives**

- a. To describe situation of the TB program (with DOTS strategy) in Tanahun district.
- b. To assess the level of knowledge of TB patients regarding TB, its treatment and DOTS
- c. To assess the perception of TB patients about different alternative approaches of DOTS program.
- d. To assess the factors affecting in patients' compliance on TB treatment in terms of DOTS strategy.
- e. To assess the perception of the health service providers involved in community based and institution based DOTS programs in terms of service delivery.

### 2. Literature review

DOTS have been officially adopted by NTPs in many countries in the world and most countries in the South Asian countries including India, Pakistan, Bangladesh and Nepal. Pilot programs based on DOTS have been introduced in each country. These have shown improved cure rates although these have been internationally sited in areas where success is likely and have received strong central support. The DOTS strategy holds the promise of improving TB control in South Asian countries but to date wider experience is limited. In particular, limited result is available on research in South Asia on the effectiveness of DOTS in areas where access is poor.<sup>5</sup>

Directly observing TB patients is a big problem in many hill districts of Nepal. A TB patient often has to walk several hours – even days – to get to health facilities to get daily TB treatment. It can not be expected them to come every day for observed treatment. Therefore, NTP has to find another way of helping them to take their treatment. The principle of DOTS does not change - observe the patient taking their medicines for at least during the intensive phase of treatment. There are many different ways to observing treatment like admitting the patient in the health facilities, increasing the number of sub centers, using the FCHVs and family member as treatment supervisor etc.<sup>21</sup>

In areas lacking a health care infrastructure, TB control is often more challenging. Research is needed to determine if this care might be provided by community based organizations. Currently, there are only a few examples of community-based organizations and NGOs successfully implementing the DOTS strategy. BRAC (Bangladesh Rural Advancement Committee), a national NGO in Bangladesh, has recently implemented the DOTS strategy to a population of nearly 7 million people and is already achieving cure rate of 80%.<sup>22</sup>

A study done in a rural district of Egypt showed that the ambulatory DOTS program has been success. Partnership between NTP and primary health center, and primary health center and the TB patient was very encouraging with respect to the case holding. The study revealed the needs for improvements, mainly related to attitude of the health staff in both diagnostic and supervisory facility. The study also showed that patient oriented strategy not automatically leads to a patient centered implementation process.<sup>23</sup>

A study in Thailand has showed that most clients with low socio- economic status and health providers perceived health center based DOTS to be impractical due to transportation cost, too sick to travel, daily work and child care responsibility. Hence the clients preferred the home based DOTS to be done early morning or late evening. However, some participants' especially female TB patients holding social status refused daily home visits due to stigma. All female and half of the male providers felt home based DOTS to be difficult because of inconvenient travel (especially in mountainous area and in rainy season), due to staff shortage and excessive TB cases. Still feasibility of home based DOTS might be improved through awareness building among staff about multiple drug resistance, intermittent DOTS and provision of transportation fuel.<sup>24</sup>

The Cape Town Metropolitan (population 2.9 million) has an accessible network of clinics who provides DOTS, excellent microscopy services, an uninterrupted supply of anti-tuberculosis drugs, and well trained and motivated staff. Although improvements in various aspects of case finding and treatment outcomes have been low since the NTP was introduced in 1996, the 85% cure rate of new smear positive cases had not been achieved. Treatment interruption (in many cases early in treatment) was of major concern and was seen as the biggest single obstacle to the attainment of the 85% cure rate.<sup>25</sup>

Due to the difficult geographical terrain with the both population and health care facilities widely scattered throughout the hills, daily DOTS was delivered during the intensive phase of the treatment via three different routes such as ambulatory from government health posts/Primary Health Centers (PHC), ambulatory from BNMT TB clinic at district center and resident in INGO (BNMT) hostel in Dhankuta, Nepal. The finding was that by offering varied delivery routes, it was possible to achieve the good results with good cure rate of DOTS even in hard to access areas. This pilot model may, however, preclude its wider implementation in Nepal. Although achieving excellent cure rate, cost to both provider and patients was extremely high.<sup>26</sup>

The secret to the success of the DOTS strategy is that it places the responsibility for curing TB patients on the health workers - not the patients. The TB epidemic spread rapidly over the past decades because patients often forget to take their medicines, remain contagious, and continue to infect others in their communities.<sup>27</sup>

### 3. Methodology

#### 3.1 Site selection

This study was conducted in Tanahun district where both community based DOTS and health institution based DOTS programs was implemented since 1996 and functioning now. Tanahun district was selected for this study site, as that was the only hill district with both types of the DOTS program implemented within a district in Nepal. Tanahun district may represent one of the typical hard to access area of Nepal this being a hill district with limited transportation facilities. Tanahun district lies in the Western Development Region with total population of 318,944.<sup>28</sup>

**3.2 Study design:** This study is non-experimental, cross-sectional, descriptive study.

#### 3.3 Variables of the study

##### Independent variables

###### *TB patients*

Behavior of health workers  
 Knowledge about TB/treatment  
 Walking distance  
 Timing of service availability  
 Availability of health workers  
 Travel cost  
 Time consumption

##### Dependent variables

Perception of TB patients  
 about DOTS

###### *Health service providers*

Regular supervision from higher level  
 Training  
 Job satisfaction of health workers  
 Performance evaluation  
 Regular logistics supply  
 Incentives  
 Workload

Perception of health service  
 providers about DOTS

(Figure 1. Dependent and independent variables of the study)

**3.4 Study population:** The following were the study population for this study

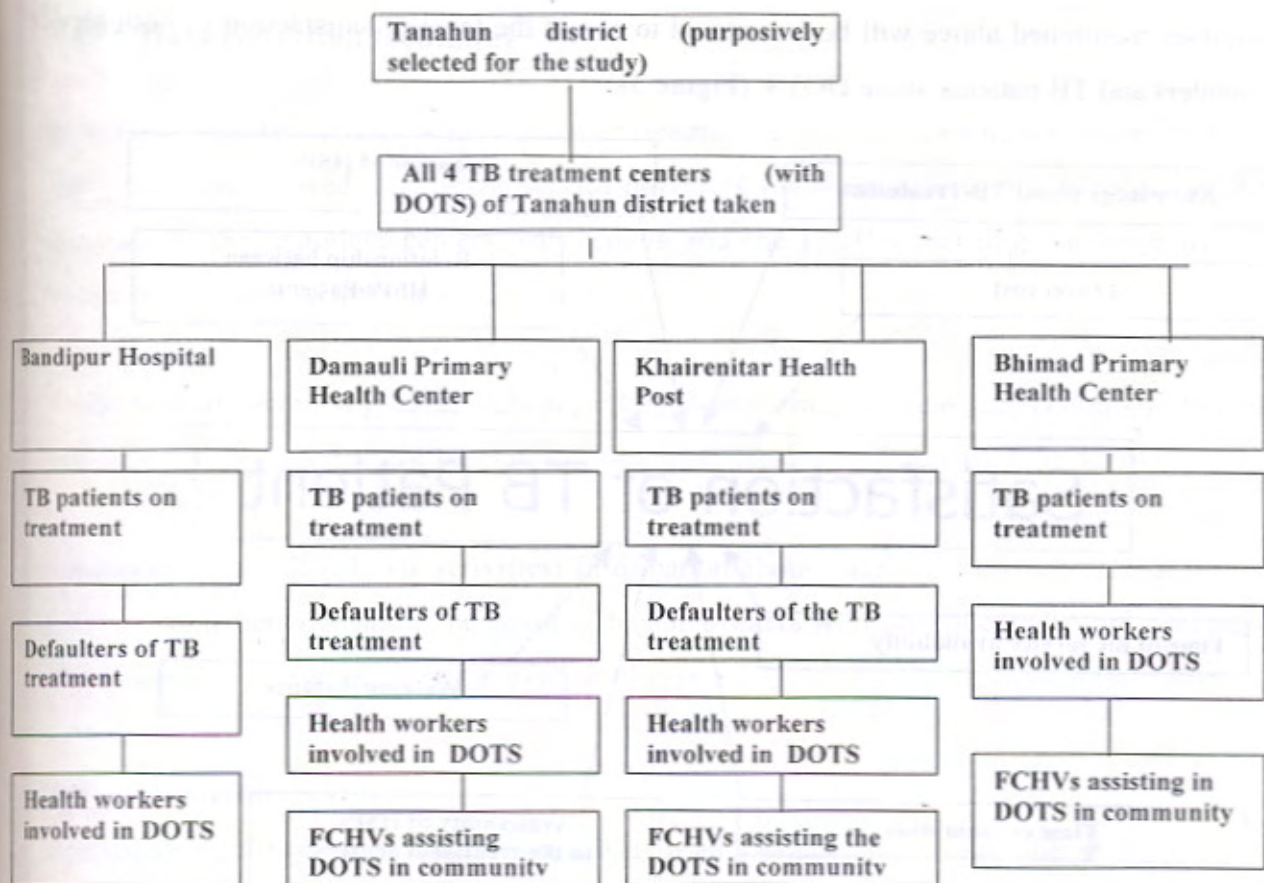
- TB Patients who were under treatment
- TB Patients who had been defaulted
- Health workers who were directly involved in the TB program with DOTS strategy.
- FCHVs who were involved in the supervision of the treatment of the TB patients during the intensive phase of their treatment in the community.

### **3.5 Exclusion criteria**

Severely ill patients who were unable to respond and the children patients under 10 years who were unable to respond the interview question were excluded.

### **3.6 Sampling procedure**

Tanahun district was selected purposively for this study, as that was the first district implementing both community- based DOTS program and the health institution based DOTS program among the hill districts of Nepal. In order to make the study sample more representatives, all four TB treatment centers were taken for the study. List of all the TB patients under treatment and defaulters were prepared from the TB treatment cards kept at the respective treatment centers. List of the health workers who were involved in the DOTS program was prepared as suggested by the District TB/ Leprosy Assistant (DTLA) at the DHO. List of FCHVs involved in the DOTS program in the community was prepared with the help of the health workers of the corresponding TB treatment centers. (Figure 2)

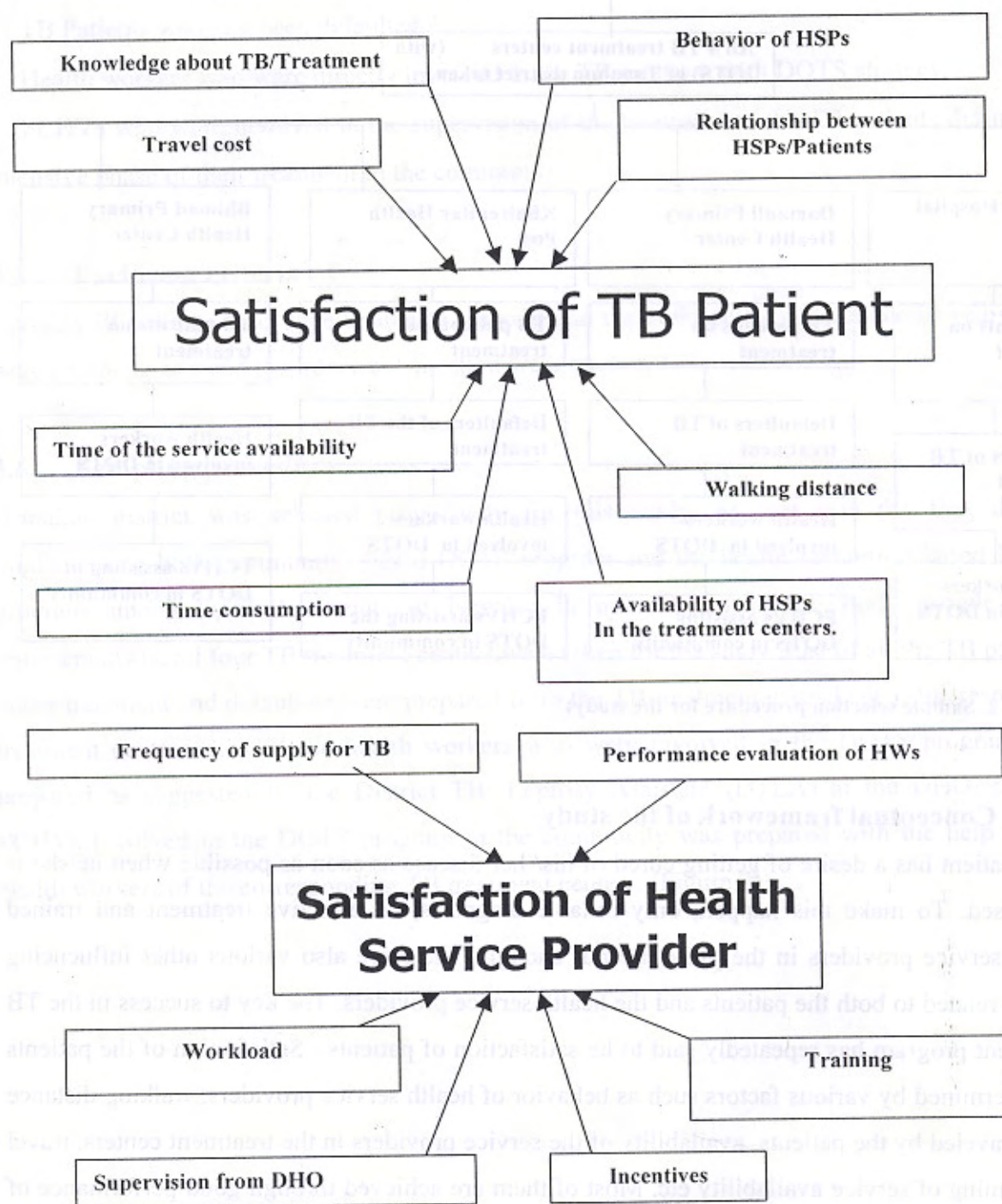


(Figure 2. Sample selection procedure for the study)

### 3.7 Conceptual framework of the study

Each patient has a desire of getting cured of his/ her disease as soon as possible when he/she is diagnosed. To make this happen, only reliable diagnosis, an effective treatment and trained health service providers in the place are not enough. There are also various other influencing factors related to both the patients and the health service providers. The key to success in the TB treatment program has repeatedly said to be satisfaction of patients. Satisfaction of the patients are determined by various factors such as behavior of health service providers, walking distance to be traveled by the patients, availability of the service providers in the treatment centers, travel cost, timing of service availability etc. Most of them are achieved through good performance of health service providers. The performance of the service providers also is determined by several factors such as workload, incentives, performance evaluation, training, and frequency of supervisory visits with quality supervision from district level and availability of timely logistics supplies from the district and region. Since the satisfaction is a composite variable, various

variables mentioned above will be considered to assess the level of satisfaction of both service providers and TB patients about DOTS. (Figure 3)



(Figure 3. Conceptual framework of the variables of the study)

### **3.8 Data collection technique**

**Interview:** The TB patients who were under treatment and defaulters who were selected for this study were interviewed. The health service providers who were directly involved in the DOTS program in the treatment centers, sub centers and the FCHVs assisting the program in the community were also interviewed.

**Collection of secondary data:** Data regarding case finding, sputum conversion and treatment outcome was collected on the basis of the 4-monthly routine NTP report of the district.

**Observation of TB related activities:** Information about microscopy activities, techniques of DOT done, patient education, behavior of health workers with the patients, record keeping etc. was obtained by observation in the treatment centers.

### **3.9 Instrumentation**

The following data collection instruments were used for collecting data for this study:

- Questionnaire for interview
- Format for recording of secondary data
- Observation guidelines/Checklist

### **3.10 Data Processing and analysis**

The data collected were edited at the end of each day each day of the collection. When some of the questionnaire were found filled up incompletely or wrongly then those were given to the enumerator to make it complete and correct. Coding was done when all necessary data were completed collecting. That facilitated in analysis of data. Quantitative data was entered into Epi info computer program and was analyzed.

### **3.11 Validity and Reliability**

Draft questionnaire was prepared with the guidance of the assigned research guide. The questionnaire finally was pre- tested in the TB clinic of NATA at Kalimati, Kathmandu. The questionnaire then was re-adjusted accordingly. Three interviewers were recruited in the field locally. A two days orientation on how to conduct an interview and record the collected information was done. Local and simple language was used while asking questions to the



respondents. The respondents were interviewed placing them in separate area within the treatment center to make them comfortable to answer the questions preventing them from possible distraction due to non-respondents. The researcher himself was involved in supervision of the interviewers as well as collecting data as far as that was possible.

### 3.12 Ethical consideration

All types of respondents of this study were clearly explained about the purpose of interview ensuring them confidentiality before the interview was started.

### 3.13. Limitation of the study

The method for data collection for this study was interview and observation. Measuring perception is not so easy as there is no specific instrument measuring perception correctly. Therefore, the method used in this study might have certain limitations to measure the perception correctly.

### 3.14. Operational definitions

Community based DOTS:	The DOTS program where the daily dose of the drugs of a TB patient is supervised by some body in the community during initial intensive phase of treatment.
Compliance:	Adherence of TB patient on his treatment as per NTP guideline.
Correct duration of TB treatment:	Eight months in SCC regimen and 12 months in the standard regimen.
Correct timing of sputum examination:	At the time of diagnosis, at the end of 2 month, at the end of 5 months and at the end of full treatment.
Correct route of transmission of TB:	Respiration and sputum of the TB patients.
Correct reason for doing DOT:	To ensure treatment, to make treatment regular, to provide correct dose of the TB drugs.
Defaulter:	A patient who at any time after registration had not collected drugs for 2 months or more.
Health service provider:	The person who is directly involved in the treatment of TB under DOTS strategy.

Health institution based DOTS:	The DOTS program where TB patients are provided TB treatment through health institution as per DOTS guideline.
Knowledge of respondents:	Ability of respondents to answer the questions.
Level of Knowledge:	<p><b>No knowledge:</b> if none of the ten questions is answered correctly.</p> <p><b>Some Knowledge:</b> if 1-3 questions are answered correctly.</p> <p><b>Adequate knowledge:</b> if 4 to 9 questions are answered correctly.</p> <p><b>Complete knowledge:</b> if all the questions are answered correctly.</p>
Perception:	Verbal response to the question regarding satisfaction with DOTS approach by TB patients and health service providers.
Satisfaction:	Verbal response of the respondents about the DOTS program
TB Patient:	Person with TB currently under treatment
Treatment supervisor:	The person who observes the daily dose of drugs of a TB patient during the intensive phase of treatment.
Treatment center:	The health institution where people with respiratory symptoms are screened for TB, and TB patient starts treatment and where there must be a laboratory and a clinic.
Treatment sub-center:	The institution/place where treatment supervisor (usually HPs/SHPs).

### 4. Findings

#### 4.1 An overview of the DOTS program in Tanahun

Tanahun is one of the 16 hill districts and lies in the Western Regional Development Region of Nepal. The total population of the district is 318,944.<sup>28</sup> It is connected with Nawalparasi in the south and Lamjung in the north. Prithvi High -Way running from Kathmandu to Pokhara passes through this district.

The District Health Office (DHO) is the main office responsible for overall management of the health service within the district coordinating with different governmental, Non-governmental and private organizations. Within the government's health service structure, there is one hospital, 2 PHCs, 13 health posts and 31 sub health posts in the district. There are 423 FCHVs and 190 TBAs in the villages of the district assisting the health service in the community level. TB program is the one of the components of the government run general health service in the district.

The Short Course Chemotherapy (SCC) without DOTS was first introduced in Tanahun district in 1995 in one PHC and 2 HPs where microscopy facility was available. In Tanahun district DOTS program was introduced in 1996 in 2 PHCs, 2 health posts and a hospital. In the same year, in order to increase accessibility of the service for the patients who were from remote areas, further health posts sub-health posts and FCHVs were also utilized for treatment supervision.

**The TB treatment centers and sub- centers of DOTS:** There were 4 TB treatment centers in the DOTS implemented area of Tanahun district. They were Damauli PHC, Bandipur Hospital, Khairenitar Health Post and Bhimad PHC. There were number of health posts, sub health posts and FCHVs assisting in the DOTS program in some community within the area.

**Facilities for sputum microscopy:** There were 4 functioning microscopy centers within the DOTS implemented area of Tanahun district. All of those microscopy centers had got good condition OLYMPUS brand Japanese microscopes. The laboratories in each treatment center were located in a separate room. In Bandipur Hospital, sputum microscopy was being done by

an AHW. In Khairenitar HP, the HPI or AHW were doing it either. In Bhimad PHC, a Lab Assistant was in place. In Damauli PHC both Lab. technician and Lab Assistant were available.

Three sputum samples from the every TB suspects were examined for diagnosis of the TB (i.e. 2 collected on the spot and one that of the next morning) according to the NTP guidelines. However, some times only one sample was examined if patient never came again with the remaining sputum samples. Result of sputum examination is given the patients on the second day of the first spot sputum specimen collected. Follow up sputum examination was being done in 2<sup>nd</sup>, 5<sup>th</sup> and at the end of the treatment (i.e. 8<sup>th</sup> month). But in case of the re-treatment cases sputum was examined in the 3<sup>rd</sup> month instead of 2<sup>nd</sup> month.

Ziehl Nelson method was used for staining sputum slides. Necessary chemicals and reagents required for sputum smear microscopy were available ready made from the Western Regional Quality Control Center (WRQCC), Pokhara. The microscopists were trained by RTC giving a 9 days-practical training in Pokhara. Quality control of the examined slides was being done by the WRQCC on the 4 monthly basis and feed back results were sent to the respective microscopy centers. The NTP lab registers were used and maintained in all microscopy centers with records of total suspects and their results including the results of follow up sputum examination.

**Diagnosis of TB:** Diagnosis of TB is made by sputum examination in all 4-treatment centers of the district. Whereas in case of sputum smear negative and extra-pulmonary cases only a medical officer had got authority for diagnosis and prescribing treatment. Sputum negative and extra-pulmonary cases are mainly diagnosed either in the PHCs where Medical Officers were available or in the Regional TB Center (RTC) in Pokhara. However, the majority of patients were found diagnosed by the RTC. Many patients went directly to RTC for diagnosis and came with a referral letter to their convenient treatment centers to start treatment. Pokhara, being quite close from Tanahun district, this kind of practice was found common. The patients diagnosed in RTC were not started their treatment from there but only from the referred treatment centers.

**Identification of treatment supervisor for DOT:** Once patients were arrived with referral letter in the treatment center for their treatment after diagnosis, the responsible person for TB program in the treatment centers provided instructions about his/ her disease and treatment.

Health workers first asked the patients if they could come to the treatment center daily for DOT for first two months of their treatment. If they were unable to come, then 2 other options were given. The first one was that treatment centers wrote a letter to the nearest HP or SHP of the patients asking the health workers if they could do DOT to the particular patient during her/his intensive phase of the treatment. The second option was that if the HP and SHP could not do so then the patient had to persuade and bring the FCHV from the respective ward of the patient as soon as possible to do DOT for the patient for first 2 months of treatment. If both options were not possible, the patients had to manage to stay nearby the treatment center until his intensive phase is completed. In case, if the patient could not do any of the above, he/ she might have to take the 12 months unsupervised regimen. However, the 12 months standard regimen was rarely required as any of the above mentioned options were possible for most of the patients.

**Responsible person for TB program (DOTS):** In all the TB treatment centers there were one or two assigned health workers responsible for conducting overall TB activities. Those health workers were provided 6 days training on TB management using training modules that designed by NTC/WHO.

**Dispense of drugs and daily DOT:** The responsible health worker through a window of the TB clinic dispensed drugs. A drug register was maintained simultaneously by the responsible health worker while dispensing the TB drugs. DOT was also done from the same window from where drugs were distributed. A water jug with drinking water was provided for the patients who took drug in the treatment center. According to the NTP guidelines of DOTS, each dose of drugs swallowed by the patients should be watched carefully by the health workers, however, in some treatment centers it was not found done so, as the health workers were found busy dispensing drugs, maintaining record and talking with other patients at that time. TB drugs were given every day (doing DOT) to those who were in intensive phase of the treatment and once a week for the patients on continuation phase. In the continuation phase, patients themselves or some one else from their family or neighbors were collecting drugs. In Damauli PHC, in one day's observation of this researcher, about 30% of the people were found non-patients collecting drugs for their family or relatives. According to the NTP guidelines, patients on continuation phase collecting the drugs must take one dose of drug of that particular day in front of the health workers in the treatment centers. However, from the interview with patients it was found that

only 28.6% of the respondents were taking it in the treatment center. Majorities (61.5%) of them were taking at their home rather than in the treatment center.

**TB clinic day:** The TB clinics were running every day for the patients on intensive phase in all treatment centers. But in Damauli PHC, Khairenitar HP and Bhimad PHC drugs for the patients on continuation phase was dispensed only once a week on a specific day. Whereas in Bandipur hospital, TB clinic remained open every day also for the patients on continuation phase.

**Treatment regimens being used:** Treatment was mainly divided into 3 main categories within the Short Course Chemotherapy (SCC) with DOTS (i.e. Category I, II and III) and 12-month regimen. They were categorized on the basis of types of TB patient registered. For example,

**Category I:** This category is given for sputum positive new patients and serious types of sputum negative and extra- pulmonary TB cases and includes 4 drugs (i.e. Isoniazid, Rifampicin, Pyrizinamide and Ethambutol). In this category all four drugs are given during the intensive phase and only Isoniazid and Ethambutol are given during the continuation phase.

**Category II:** For all types of re-treatment cases (i.e. Relapse, Treatment failure and Returned after defaulters and includes 5 drugs (i.e. Streptomycin, Isoniazid, Rifampicin, Pyrizinamide and Ethambutol). In this category all five drugs are given for the first 2 months, 4 drugs for one more month and 3 drugs until the course of treatment is completed.

**Category III:** This category is given for sputum negative patients and extra- pulmonary cases and it includes only 3 drug (i.e. Isoniazid, Rifampicin and Pyrizinamide). In this category all 3 drugs are given for first 2 months and 2 drugs for rest 6 months.

The 12-month regimen with Streptomycin, Isoniazid, and Ethambutol was used some time for the patients who could not come daily for DOT. However, I did not find such patients registered during the 8 months period and receiving treatment.

**Supervision in the treatment centers from the district:** The DTLA in the DHO is the responsible supervisor for TB program within the district. In Tanahun district the post of DTLA was vacant at the time of data collection for this study. The EPI supervisor was looking after both statistics section and TB/Leprosy section. Due to more responsibilities to him, he was found unable to visit treatment centers regularly as required. Similarly, health workers in those treatment centers also complained about lack of supervisory visits from district. However, need of supervision in some treatment centers was not felt by the health workers as far as the training to health workers, logistics and drugs for the program were regular. But in Bandipur Hospital the health worker responsible for the TB program expressed need for regular supervision and communication with district since telephone line in the hospital was disconnected for many months and the DTLA was not visited there for more than 3 months. The health workers were facing problem due to lack of communication with the district head quarter at Damauli.

**Logistics supply system for TB program:** Drugs, chemicals, forms, registers and other necessary materials were made available from the RTC, Pokhara on 4 monthly basis and also was available as per need if really necessary. Drugs were supplied on the basis of 4 monthly case finding report (i.e. number of patients registered during the previous 4 months). Regarding the supply of the logistics for the TB program health workers did not mention any problem. They were satisfied with the supply of the logistics except the supply of damaged Ethambutol and frequent change of the form and size of tablets of TB drugs.

**Recording/ reporting system of TB program:** For keeping records of the TB patients there were two types of cards, treatment card and patients retained card. Treatment cards were kept and maintained in the treatment centers by the responsible health worker whereas the patient retained card was given to the patient. The health workers maintained treatment cards every day after dispense of drugs and DOT is over. TB treatment cards in the treatment centers were kept in a wooden rack or in folders classifying them into different categories e.g. Intensive phase, Continuation phase, Defaulters, Re-treatment etc. In each treatment center there were TB registers maintained which included necessary information about the treatment of the TB patients registered which are required for regular monitoring of the TB program. All the TB patients once diagnosed and started treatment were registered with code numbers (called TB No.). Until last year the district TB register was maintained by the DTLA doing his regular supervisory visits in all the treatment centers and used to keep it in the DHO. However, from last

year the registers were started to keep only in the treatment centers. Reporting of the overall TB activities of the district were done by the DTLA at the end of every 4-months in RTC Pokhara.

**Types of TB patients registered for treatment (on the basis of case definition of NTP):** The records reviewed in 4 treatment centers showed that majority (71.1%) of the registered TB patients were under the registration category *new* and lowest (2.4%) was under *treatment failure*. Treatment category wise, there were 51.2% of respondents in the category I and 30.1% in the category III. Proportion of patients were higher (18.7%) in the category II (re-treatment). According to NTP the expected proportion of the re-treatment cases should be between 5-25% of all positive case.<sup>19</sup>

In terms of types of TB patients under treatment, majority (62%) of patients were under the sputum positives, which indicated that sputum examination was well emphasized as per NTP guidelines. There were more (74.1%) patients in the continuation phase of treatment than that of the intensive phase. (Table: 1)



**Table: 1. Types of TB patients registered for treatment in the 4 treatment centers in Tanahun district according to the case definition of NTP (Record reviewed on 26/8/2056)**

Characteristics		Number	Percent
Registration category	New	118	71.1%
	Returned after defaulter	15	9.1%
	Relapse	16	9.6%
	Transfer in	5	3.0%
	Treatment failure	4	2.4%
	Others	8	4.8%
	<b>Total</b>	<b>166</b>	<b>100%</b>
Treatment category	Category I	85	51.2%
	Category II	31	18.7%
	Category III	50	30.1%
	<b>Total</b>	<b>166</b>	<b>100%</b>
Types of TB cases	Sputum positive	103	62.0%
	Sputum negative	33	19.9%
	Extra pulmonary	30	18.1%
	<b>Total</b>	<b>166</b>	<b>100%</b>
Phase of treatment	Intensive phase	43	25.9%
	Continuation phase	123	74.1%
	<b>Total</b>	<b>166</b>	<b>100%</b>

**Review of the 4-monthly report of the DOTS program (first quarter 2056/57):** As part of the situation analysis of the TB program in Tanahun district, report of the previous 4 months period (Shrawan to Kartik) was available from the DHO Tanahun. These reports were being prepared by the DTLA and presented in every 4 months in the RTC, Pokhara on routine basis. The monthly report had mainly 5 parts. However, 3 major parts of the report is reviewed and explained briefly below:

**Four monthly case finding report:** According to the four-monthly case finding report of the district, altogether 85 different TB cases were diagnosed and started treatment between Ashad and Kartik 2056 in the district. Thirteen *Other cases* (cases that do not easily fit with NTP case definition and usually coming from private practitioners) were added. Thus 98 patients had started their treatment during the previous quarter (Shrawan- kartik 2056). Treatment category wise, 47, 19, and 31 patients were in the category I, II and in III respectively. There was only one case in the 12-month regimen. Among the sputum positive cases registered during that period, proportion of male was 72.5%.<sup>29</sup>

#### **Four monthly sputum conversion report (sputum examined at 2 months of the treatment)**

According to the four monthly report of the period between Chaitra to Ashad 2055/2056 (i.e. 3<sup>rd</sup> quarter), the sputum conversion rate of the sputum positive patients at the end of 2 months of treatment was 81.13%. Whereas the conversion rate of relapse, failure and returned after defaulter was 71.43%, 100% and 100% respectively. Where, 8 patients were still remained positive, 1 was defaulted, 1 was died and 3 were under *No result* category.<sup>30</sup>

**Four monthly treatment outcome report:** When the treatment outcome report of the TB patients registered during first quarter of 2054/055 (Shrawan to Kartik) was reviewed, the cure rate of the *new smear positive, failure and returned after defaulter* cases were 80%, 33.33% and 100% respectively. The NTP target for cure rate of sputum positive cases is 85%.<sup>31</sup>

#### **4.2 General profile of the respondents (TB Patients)**

**Socio-demographic characteristics of the respondents:** Ethnicity wise, majority (29.8%) of the respondents was from the Magar/Gurung. The **other** ethnic group that includes Newar, Darji, Bishokarma, Sarki, Sherpa, Tamang, Gharti and Darai were relatively lesser in number among the respondents. Among them 83% was Hindu and 17% were Buddhists. Occupation wise, agriculture was the main occupation of the respondents (69.1%) and labor was the second highest (16.0%) where business was least of all (3.2%).

Education wise, majorities (27.7%) were illiterate. Where SLC and above were only (6.4%). Most of the respondents were married (87.2%) and living in nuclear types of family. Respondents in the age group 30- 39 was found higher (22.3%) than other age groups. The lowest (9.6%) were from age group 60 years and above. Proportion of males were higher (73.4%) than the females. (Table 2)

Table: 2. Socio-demographic characteristics of the respondents.

Characteristics		Number	Percent
Age group	10-19 years	11	11.7%
	20-29 years	17	18.1%
	30-39 years	21	23.3%
	40-49 years	20	21.3%
	50-59 years	16	17.0%
	60 and above	9	9.6%
	<b>Total</b>	<b>94</b>	<b>100%</b>
Sex	Male	69	73.4%
	Female	25	26.6%
	<b>Total</b>	<b>94</b>	<b>100%</b>
Educational status	Illiterate	26	27.7%
	Literate	17	18.1%
	NFE completed	14	14.9%
	Up to class 5	15	16.0%
	Class 6-10	15	16.0%
	SLC and above	7	7.4%
	<b>Total</b>	<b>94</b>	<b>100%</b>
Occupation	Agriculture	65	60.1%
	Trade	3	3.2%
	Service	5	5.3%
	Labor	15	16.0%
	Student	6	6.4%
	<b>Total</b>	<b>94</b>	<b>100%</b>
Ethnicity	Brahmin	13	13.8%
	Chhetri	16	17.0%
	Magar/Gurung	28	29.8%
	Others	37	39.4%
	<b>Total</b>	<b>94</b>	<b>100%</b>
Type of family	Nuclear	45	47.9%
	Joint	42	44.7%
	Extended	7	7.4%
	<b>Total</b>	<b>94</b>	<b>100%</b>

**Respondents by Case definition of NTP:** Among the respondents selected for interview sputum positive patients were in higher proportion (60.6%) and lowest were extra pulmonary cases (11.7%). Rests (27.7%) of the respondents were sputum negatives cases. As per registration category of the respondents, new patients were with higher proportion (72.3%). According to health workers, relapse cases were in the increasing trend and was 11.7% of the

total respondents of this study. Treatment category wise, the highest proportion of patients were in the category I (48.9%). Proportion of category II patients indicated that it was much higher than expected proportion. According to NTP guidelines the expected proportion of re-treatments is 5 to 25% of all sputum positive cases registered where it was found 28.15% of re-treatment case on treatment. According to phase of the treatment, most of the respondents were in the continuation phase. (Table 3)

Table: 3. Respondents by case definition of National TB Program

Type of TB	Characteristics	Number	Percent
	Sputum positive	57	60.6%
	Sputum negative	26	27.7%
	Extra pulmonary	11	11.7%
	<b>Total</b>	<b>94</b>	<b>100%</b>
Registration category	New	68	72.3%
	Relapse	11	11.7%
	Treatment failure	2	2.1%
	Returned after defaulter	8	8.5%
	Transfer in	2	2.1%
	Other	3	3.2%
	<b>Total</b>	<b>94</b>	<b>100%</b>
Treatment category	Category I	46	48.9%
	Category II	18	19.2%
	Category III	30	31.9%
	<b>Total</b>	<b>94</b>	<b>100%</b>
Phase of treatment	Intensive phase	31	33.0%
	Continuation phase	63	67.0%
	<b>Total</b>	<b>94</b>	<b>100%</b>

#### 4.3 Knowledge of respondents about TB and its treatment

**Knowledge of the respondents about the disease under treatment:** All of the respondents were asked name of the disease they were under treatment to assess their knowledge if they knew it correctly. High proportions (98.9%) of respondents were found having correct knowledge about the disease that they were on treatment (i.e. TB).

**Knowledge of the respondents about whether TB is a communicable disease:** In order to assess their knowledge about whether TB was communicable disease a question was included

the questionnaire where very high proportion of respondents (87.2%) had correct knowledge. Rest of them said TB either as not communicable (6.4%) or they did not know at all (6.4%). (Table 4)

Table 4. Knowledge of respondents about whether TB is a communicable disease

Responses	Number	Percent
TB is communicable	82	87.2%
TB is not communicable	6	6.4%
Don't know	6	6.4%
Total	94	100%

**Knowledge of respondents about medium of transmission of TB:** Among the respondents 38.3% answered correctly and 26.6% answered incorrectly. Where, 35.1% of them did not know about the medium of transmission of the disease. (Table 5)

Table 5. Knowledge of respondents about medium of transmission of TB

Response	Number	Percent
Correct answer	36	38.3%
Incorrect answer	25	26.6%
Don't know	33	35.1%
Total	94	100%

**Knowledge of the respondents about duration of treatment of TB:** Regarding the knowledge on duration required for treatment of TB as the disease they were on treatment, 92.6% of the respondents answered correctly (i.e. 8 months), 5.3% of the respondents answered incorrectly and 2.1% had responded that they did not know the duration of treatment. (Table 6)

Table 6. Knowledge of respondents about duration of TB treatment

Duration of treatment	Number	Percent
Correct duration	87	92.6%
Incorrect duration	5	5.3%
Don't know	2	2.1%
Total	94	100%

**Knowledge about consequences of defaulting from TB treatment:** Majority of respondents (58.5%) thought that TB may get relapsed if treatment is stopped before completing full course whereas 17.0% of them thought TB drugs would not work again. Where 5.3% mentioned that stopping treatment might require re-treatment and 19.1% had no knowledge about it. (Table 7)

Table 7. Knowledge of the respondents about consequences of defaulting from treatment

Consequences	Number	Percent
Relapse	55	58.5%
Drug does not work	16	17.0%
Need re-treatment	5	5.3%
Don't know	18	19.1%
Total	94	100%

**Knowledge of respondents about the reason for examination of sputum:** All the respondents were asked about the reason for sputum examination during treatment. Majority (70.2%) of them said that sputum is examined in order to assess the rate of cure of the disease and 27.7% of them were unaware about the reason. It indicated that the respondent had high knowledge about the reasons for sputum examination. (Table 8)

Table 8. Knowledge of respondents about the reason for sputum examination

Reasons	Number	Percent
To assess cure	66	70.2%
To assess efficacy of TB drugs	2	2.1%
Don't know	26	27.7%
Total	94	100%

**Knowledge of respondents about frequency of sputum examination (during treatment):**

Respondents were also asked about the prescribed frequency and timing of sputum examination required during the course of their treatment, where 28.7% of the respondents were found to be known correctly and rest of other either did not know at all (25.5%) or knew incorrectly (45.7%). The respondents who were in the continuation phase were found more knowledgeable than those that were in the intensive phase of their treatment. (Table: 9)

Table 9. Knowledge of respondents about frequency of sputum examination

Responses	Number	Percent
Correct answer	27	28.7%
Incorrect answer	43	45.7%
Don't know	24	25.5%
Total	94	100%

**Knowledge of TB patients about the reason for doing DOT:** Regarding the knowledge about the reasons for doing DOT (Directly Observed Therapy or Directly observed Treatment), in an aggregate high proportion (82%) of the respondents were found to have knowledge about the reason for doing DOT which were to ensure complete treatment, to make treatment regular and to provided correct dose of the drugs. (Table 10)

Table 10. Knowledge of respondents about reasons for DOT

Reasons for doing DOT	Number	Percent
To ensure treatment	58	61.8%
To make treatment regular	14	14.9%
To provide correct dose	5	5.3%
Don't know	17	18.0%
Total	94	100%

**Level of knowledge of the respondents about TB and its treatment:** Ten different questions were asked to the respondents to assess the level of their knowledge about the disease they were under treatment (TB) and different aspects of its treatment including DOTS. The answers they gave were analyzed and categorized on the basis of number of questions answered correctly. Among the respondents, majority (89.4%) of them had good knowledge, 3.2% had complete knowledge and 7.4% had some knowledge. (Table 11)

Tables 11. Level of knowledge of respondents about TB and treatment

Status of knowledge	Number	Percent
Complete knowledge	3	3.2%
Good knowledge	84	89.4%
Some knowledge	7	7.4%
No knowledge	0	0%
Total	94	100%

**Source of information of the respondents about TB and its treatment:** At the end of the questions regarding knowledge a separate question was asked to the respondents to know the source of information from which they were aware about TB and its treatment. About 81% of the respondents were found to have received information from the health workers of their respective treatment centers and rest of the other source were 8.5% by self, 6.4% from radio and 4.3% from other sources such as friends, relatives, Manipal college, private practitioners etc. (Table: 12)

Table: 12. Source of information of the respondents about TB and Treatment

Source of information	Number	Percent
TB treatment center	76	80.8%
Radio	6	6.4%
Self	8	8.5%
Others*	4	4.3%
Total	94	100%

(\*Others include Private practitioners, Manipal Hospital, RTC and friends)

#### 4.4 Perception of the respondents about alternatives of the existing DOTS program

The TB patients were asked if they had some other options from the existing DOTS program for their convenient. Their preference was as follows.

**Preference of the respondents about different approaches of DOT:** According to the following table majority of the respondents (46.8%) preferred health institutions, 26.6% preferred family and only 1.1% preferred private clinics as place for DOT. (Table: 13)

Table: 13. Preference of respondents about different approaches of DOT

Preferred place for DOT	Number	Percent
Health institution	44	46.8%
Community	24	25.5%
Family(home)	25	26.6%
Private practitioners	1	1.1%
Total	94	100%

**Reasons for preferring health institution based DOT:** As majority of the respondents preferred health institution based DOT, further question was asked to them for the reasons for preferring health institution as the place for DOT. The majority (47.7%) preferred health institution because of their faith with the health workers than others. About 27 % of the respondents preferred treatment centers being it closer from their home, 13.6% were preferred health institution because they enjoyed travelling around and meeting friends while going to the treatment centers and 11.4% respondents preferred it because they could also have regular check ups by the health workers when they go to the treatment center. (Table 14)



Table 14. Reasons for preferring health institution based DOT

Reasons for Health Institution based DOT	Number	Percent
More faith with the health institutions	21	47.7%
Can be see around in bazaar and meet friends	6	13.6%
Health institution too close from home	12	27.3%
Can be have checked by the health workers	5	11.4%
Total	44	100%

**Reasons for preferring community based DOT:** The respondents who preferred community as the place for DOT were further asked about the reasons for preferring community. Among the 24 respondents who preferred community based DOT, majority (45.9%) had preferred community base DOT to save their travel cost, 33.3% due to difficulty in travel and 20.8% because they could utilize the travel time in their own work at their home or in the field.

(Table 15)

Table 15. Reason for preferring community based DOT

Reasons for community based DOT	Number	Percent
Walking time can be utilized at home/fields	5	20.8%
Travel cost can be saved	11	45.9%
Need not walk long distance	8	33.3%
Total	24	100%

**Reasons for preferring family based DOT:** Reasons for preferring home and community as place for DOT was almost the same. However, the proportions of the respondents were slightly different. Majority (48%) of respondents found preferred family based DOT to avoid travelling, 36% preferred because the travelling time could be utilized in their work and 16% in order to save the travel costs. (Table 16)

Table 16. Reasons for preferring family based DOT

Reasons for preferring family based	Number	Percent
Saves travel cost	4	16%
Travel time can be utilized in work at home	9	36%
Need not walk	12	48%
Total	25	100%

**Most appropriate person for treatment supervisor in the community as suggested by the respondents:** Respondents were asked if they had any idea about the appropriate person who

could be a treatment supervisor in their community as per their preference. The majority (75.9%) of the respondents was found preferred FCHVs as their treatment supervisor, where most of them were among the patients who were already being/been supervised by FCHVs. The VHWs and TBAs were preferred less (6.9%) and (3.4%) respectively. About 14% of the respondents preferred other people as treatment supervisor who included schoolteachers and general people. (Table 17)

Table 17. Most appropriate person as treatment supervisor in the community as suggested by the respondents

Appropriate person	Number	Percent
FCHVs	22	75.9%
VHWs	2	6.9%
TBAs	1	3.5%
Others	4	13.8%
Total	29	100%

#### 4.5 Perception of respondents about DOTS program

In order to know perception of the respondents, different factors such as time spent for service, behavior of the health workers, distance to be traveled, timing of the service availability and waiting time in the treatment centers was tried to assess and are discussed briefly below.

**Time spent by the respondents while visiting treatment center:** Respondents were asked about time they had to spend while going to the treatment centers in each visit. It was found that majority (53.2%) of patients had to spend more than 1 hour in each visit, which includes both going and coming back home. (Table 18)

Table 18. Time spent by the respondents while visiting to the treatment center:

Time taken	Number	Percent
<15minutes	22	23.4%
15-30 minutes	18	19.1%
30-60 minutes	4	3.3%
>60 minutes	50	53.2%
Total	94	100%

**Proportion of the respondents spending more than one hour for the service:** The respondents who had to spend more than 1 hour was further classified. It was found that 70% of

the respondents had to spend 1-2 hours, 20% had to spend 3-4 hours and 10% had to spend 5-12 hours of time for their service. (Table 19)

Table 19. Proportion of the respondents spending more than one hour for the service

Time spent	Number	Percent
1-2 hours	35	70%
3-4 hours	10	20%
5-12 hours	5	10%
Total	50	100%

**Acceptable travelling duration for respondents while visiting treatment centers:** When asked about the most acceptable duration of time for the respondents when they go for treatment both in the treatment centers and treatment supervisors, majority (64.9%) of respondents said that their most acceptable duration of time was less than 10 minutes of walk. But for 2.1% of respondents even more than one hour of the time was acceptable. (Table 20)

Table 20. Acceptable travelling duration for respondents while visiting treatment centers

Acceptable time period	Number	Percent
Less than 10 minutes	61	64.9%
10-20 minutes	11	11.7%
20-30 minutes	10	10.6%
30-60 minutes	10	10.6%
>60 minutes	2	2.1%
Total	94	100%

**The desired time of the respondents for DOT and the actual time of DOT being done:** Regarding the time the respondents desired to have DOT, majority (68.1%) of them liked day time and 31.9% liked morning as their desired time for DOT. Most of the respondents who preferred morning were the patients who were supervised by FCHVs in the community and those who preferred day time were patients who had/having DOT from the treatment centers. Regarding the time at which the patients were taking drugs on supervision of their treatment supervisors, majority (75%) of the respondents were taking their drugs in the daytime while 23% of them were taking at morning. (Table 21)

Table 21. The desired time of the respondents for DOT and the actual time DOT being done

Time of DOT	Time desired for DOT		Time DOT being done	
	Number	Percent	Number	Percent
Morning	30	31.9%	22	23.4%
Day	64	68.1%	71	75%
Evening	0	0%	1	1.1%
Total	94	100%	94	100%

**Need of waiting in the treatment centers/treatment supervisors:** When inquired if the respondents had to wait for treatment when they visit treatment centers or treatment supervisors, only 37.2% of the respondents said they had to wait for the service. (Table 22)

Table 22. Need of waiting in the treatment centers/supervisors

Waiting	Number	Percent
Needed	35	37.2%
Not needed	59	62.8%
Total	94	100%

**Waiting time of the respondents in treatment center/treatment supervisors' home:** Among the respondents, who had to wait for their service, further inquiry was done to know about the length of time to be waited. Where majority (45.7%) of them had to wait less than 10 minutes, 42.9% of the respondents had to wait between 10-20 minutes and only 11.4% said that they had to wait between 20- 30 minutes approximately. (Table 23)

Table 23. Time to be waited by the respondents at the treatment centers/supervisors

Waiting time	Number	Percent
< 10 minutes	16	45.7%
10-20 minutes	15	42.9%
20-30 minutes	4	11.4%
Total	35	100%

**Respondents suffered from side effects of the TB drugs:** Among the respondents when asked about if they had experienced any type of side effect of the TB drugs, 21.3 % of them expressed that they had suffered from different types of side effects of the drugs but most of them were suffered from milder type. (Table 24)

Table 24. Respondents suffered from side effects of the TB drugs.

Side effects	Number	Percent
Occurred	22	21.3%
Not occurred	72	78.7%
Total	94	100%

**Place of side effects management done:** The respondents who were suffered from side effects with TB drugs were inquired about the place of their treatment for the side effects, where most (86.4%) of them had received their treatment from their respective treatment centers. Rest of them either had received treatment from hospitals outside the district or the side effects had been disappeared without any treatment. (Table: 25)

Table 25. Place of side effects management done by the respondents

Place of side effects management	Number	Percent
TB treatment centers	19	86.4%
Hospital	1	4.5%
No where	2	9.1%
Total	22	100%

#### 4.6 Perception of TB patients about health workers

**Behavior (listening to the patients) of the health workers at the treatment centers:** In order to assess the perception of the respondents about the behavior of the health workers towards the respondents, question was asked about whether they listened to the patients to their problems. Majority (81.9%) of the respondents expressed that health workers listened to them when they asked about some problems. A minority (3.2%) of respondents said that the health workers some times did not listen to their problems. Further questions were asked to those who said health workers did not listen to them about the context in which they did not listened to them. It was found that it was mainly related to drug distribution, when the health workers were reluctant to give drugs for more than one week as demanded by the patients. (Table 26)

Table 26. Behavior (listening to the patients) of the health workers with the patients

Listening by health workers	Number	Percent
Listened carefully	77	81.9%
Not listen carefully	3	3.2%
Not concerned	14	14.9%
Total	94	100%

**Response of the health workers with TB patients in the treatment centers:** When the respondents were asked about the response (dealing) of the health workers of the treatment centers, most (78.7%) of the respondents mentioned that the health workers responded patiently when they dealt with them. Where 6.4% of them expressed that they did not respond patiently and 14.9% of them were found not concerned with the health workers, as they did not need any help that far. (Table 27)

Table: 27. Response of the health workers with the respondents

Response	Number	Percent
Respond patiently	74	78.7%
Do not respond patiently	6	6.4%
Not concerned ( help not required)	14	14.9%
Total	94	100%

#### 4.7 Satisfaction of the respondents about DOTS program

**Satisfaction with the treatment supervisors:** The treatment supervisor is one who has a major role for ensuring each dose of the drugs of the patients for the first 2 months of treatment. Therefore relationship between the patients and the supervisor is vital. The respondents were asked if they were satisfied with their treatment supervisors both in community and in the health institution. Most of (86.2%) respondents were found fully satisfied with their supervisors and rest (13.8%) was satisfied partially. (Table 28)

Table 28. Level of satisfaction of respondents with TB treatment supervisors

Level of satisfaction	Number	Percent
Fully satisfied	81	86.2%
Partially satisfied	13	13.8%
Less satisfied	0	0%
Total	94	100%

**Satisfaction of the respondents with the service (DOTS):** Patients' satisfaction with service provided is most important aspect of any health service. In this study, almost all (98.9%) of the respondents were found to be satisfied with the overall service related to TB treatment they received from the health institutions. When asked them about the reasons for satisfaction with service, the main reason for their satisfaction was due to certainty of cure of their disease with the treatment they were receiving. The respondent who was not satisfied with the service was

due to the reason that drugs was not given to him/her by the health workers as per their demand and for longer period of time (i.e. more than one week) (Table 29)

Table 29. Satisfaction of the respondents with the service (DOTS)

Response	Number	Percent
Satisfied	93	98.9%
Not satisfied	1	1.1%
Total	94	100%

**Level of satisfaction about the service provided by the health service providers:** Among the respondents who were satisfied with the service were further asked about the degree or level of their satisfaction. Again the proportion was found higher (85.1%) among the respondents who were fully satisfied and only 14.9% of them were partially satisfied with the service. (Table 30)

Table 30. Level of satisfaction of the respondents about the service provided by the HSPs.

Level of satisfaction	Number	Percent
Fully satisfied	80	85.1%
Partially satisfied	14	14.9%
Less satisfied	0	0%
Total	94	100%

#### 4.8 Relationships between satisfaction of respondents with other factors

**Association between waiting time of the respondents and level of satisfaction:** When the relationship between the waiting time of the patients in the treatment centers for their service was analyzed, it showed that the waiting time had no influence in increase or decrease of the level of satisfaction of the respondent with the service. (Table 31)

Table: 31. Association between average time to be waited by respondents for service and level of satisfaction.

Average time to be waited	Level of satisfaction from service		
	Fully satisfied	Partially satisfied	Total
<10 minutes	12 (70.51%)	5 (29.49%)	17 (100%)
10-20 minutes	13 (86.67%)	2 (13.33%)	15 (100%)
20-30 minutes	4 (100%)	0 (0%)	4 (100%)
>30 minutes	1 (50%)	1 (50%)	2 (100%)
Total	30 (78.95%)	8 (20.05%)	38 (100%)

(p value =0.3438)

**Time spent by the respondent while visiting treatment centers and level of satisfaction with the service:** When result of the time spent by the respondents and the level of satisfaction of the respondent regarding the service was analyzed, it showed that there was no relationship between the time spent by the respondents and the level of satisfaction with service provided by the treatment centers. (Table 32)

Table: 32. Association between time spent by respondents while visiting to the treatment center and level of satisfaction with the service.

Time spent while visiting TC/TS	Level of satisfaction from service		
	Fully satisfied	Partially satisfied	Total
<15 minutes	19 (86.36%)	3 (13.64%)	22 (100%)
15-30 minutes	15 (83.33%)	3 (16.67%)	18 (100%)
30-45 minutes	3 (100%)	0 (0%)	3 (100%)
45 minutes and above	42 (84%)	8 (16%)	50 (100%)
Total	79 (84.95%)	14 (15.05%)	93 (100%)

(P Value 0.8877)

**Association between behavior of health workers (listening to the patients' problems) and level of satisfaction of the TB patients with service:** Most of the respondents were highly satisfied with the service provided by the health workers and FCHVs irrespective of their behavior. The result showed that there was no influence of listening to the patients' problem for increase or decrease of the level of satisfaction of the patients with the service provided by the treatment centers. (Table 33)

Table 33. Association between listening behavior of the health workers and level of satisfaction of the respondents with the service

Listening to the TB patients by the HWs	Level of satisfaction from service		
	Fully satisfied	Partially satisfied	Total
Patiently	66 (85.71%)	11 (14.29%)	77 (100%)
Not patiently	3 (100%)	0 (0%)	3 (100%)
Not concerned	11 (78.57%)	3 (21.43%)	14 (100%)
Total	80 (85.11%)	14 (14.89%)	94 (100%)

(P Value 0.600)

**Association between response of the health workers and level of satisfaction of the patients:** Among the patients who said health workers respond patiently while dealing with them, majority (85.14%) of them was fully satisfied. But among the respondents who said the health workers' behavior was not patient they still were fully satisfied with the service they provided.



The respondents who did not concern with the health workers were also found satisfied either fully or partially, majority being in fully satisfied. The study showed that there was no relationship between the behavior of the health workers and the level of satisfaction of the TB patients with the service. (Table 34)

Table 34. Association between response to the patients by the health workers and level of satisfaction of the respondents with the service

Response to TB patients by the HWs	Level of satisfaction from service		
	Fully satisfied	Partially satisfied	Total
Patiently	63 (85.14%)	11 (14.86%)	74 (100%)
Not patiently	6 (100%)	0 (0%)	6 (100%)
Not concerned	11 (64.94%)	3 (35.06%)	14 (100%)
Total	80 (85.11%)	14 (14.89%)	94 (100%)

(P value 0.4672)

#### 4.9 Perception of defaulters about the TB treatment

According to NTP definition defaulter is the patient who has not collected his/her drugs for more than 2 months. Defaulting from the treatment is one of the constraints of the National TB program to achieve high cure rate. According to the health workers of the different treatment centers of Tanahun, main reasons for getting defaulted from the TB treatment were side effects, feeling of well being, ignorance, migration and sudden switching on of the treatment from intensive phase to the continuation phase of treatment, where number of drugs are reduced suddenly.

Only those defaulters who were within 8 months of the treatment were considered as sampling frame for this study as the perception of those respondents about DOTS program could be in terms of the current program rather than past. In other word, if older defaulters were taken as sample, their response would not relate to the current program and the service providers. On review of the record of the TB patients in 4 treatment centers, altogether 9 people were found defaulted from their treatment with DOTS within the 8 months period out of 175 patients registered (166 patients on treatment and 9 defaulters). Number of defaulters were highest (6) in Bandipur hospital, 2 in Damauli PHC and 1 in Khairenitar Health Post. According to the health workers of Bhimad PHC, there were no any defaulters in that PHC at the time of our visit. During the data collection for this study only four defaulters became available with the help of health workers, FCHVs and TB patients on treatment and were interviewed. In this study, emphasis was mainly given to identify the reasons for defaulting from the TB treatment.

One of the defaulters interviewed living quite close to the health post stopped his treatment during intensive phase of his treatment. Main reason for stopping the treatment was because he *loose his faith on diagnosis* of his disease, as he was not getting better despite 2 months of regular treatment with DOT. As a result, he thought that he was not getting TB. That led him to seek alternative treatments from allopathic private practitioners and traditional healers. He got much serious despite all the possible efforts he made till he could afford. Finally, it was too late for an appropriate treatment. He was very serious and was lying on his bed at his home when I went to his home for an interview. (Case study- 1)

#### *Case study 1*

*Mr. Badri Nath Gurung (52) was retired from Indian Army last year. He is from Dulegaunda VDC, very close to the Khairenitar Health Post. He was diagnosed bone TB of leg in the RTC in Pokhara 3 months ago and referred to Khairenitar HP for treatment. Mr. Gurung continued his treatment for 2 months and stopped it because he did not get better as he expected. So he thought that he was not suffered from TB. At the mean time, according to his wife, he had taken an egg omelet given by one of his lady relatives, which made him more serious suddenly. He was then taken to Pokhara for treatment in the private clinics 3 times by his wife. The doctor there prescribed number of capsules and syrups. By that time most of his money was finished due to investigation, drugs, transportation and lodging. He came home with some drugs and took them for one week and stopped. After a week he became much serious and also his legs got paralyzed. Local traditional healers also treated him with locally available herbs and Mantras. When we visited to his home for an interview with help of a woman of that village, he was lying on his bed inside mosquito net and was unable to speak at all. According to the health post staff he was requested to resume his treatment but he was not willing to do thinking that he was not suffered with TB. When asked if he would resume TB treatment his wife said she would not do it as that was not due to TB.*

Another defaulter had stopped his treatment when he completed his 2 months of intensive phase of treatment. Main reason for stopping his treatment was due to his *feeling of well being* after 2 months of his treatment. Though the health workers had explained him about the actual duration of treatment and consequences of stopping the treatment, he did not take it so seriously because there was no signs and symptoms of TB left. In this case, perhaps he was not fully convinced with the instructions given by the health workers. (Case study 2)

### Case study 2

*Dhana Bahadur Gurung (55) is from Deurali VDC of Tanahun district some two hours walk from Bandipur bazaar. He was diagnosed sputum smear positive TB in Pokhara and was referred to Bandipur hospital for treatment. He was admitted in the hospital according to policy of the hospital and was done DOT for first 2 months of his treatment. He was discharged from the hospital with TB drugs for one week and was suggested him to come next week. But he did not come. He was sent messages through his neighbor villagers to come for drugs in the hospital but he still did not come. Mr. Gurung was available for interview in Bandipur when he was there to buy things. According to him he was aware of duration of his treatment through the hospital staff but he thought that he was completely cured and may not require further treatment. At that moment he was felt well and did not think about any treatment. But he said that he would get treatment only if he get any problem in future.*

The third case of defaulter interviewed had first received treatment for gland TB from the private practitioner in Pokhara. After one month of treatment he went to the RTC, Pokhara for free treatment and was sent to Damauli PHC. He started his treatment in the Damauli PHC and stopped it because he thought he **got better** after 4 months of his treatment. Further more, his **friends advised him** that the gland TB did not require 8 months of treatment like in the case of the pulmonary TB. (Case study 3)

### Case study 3

*Bam Bahadur Basnet (27) is from Vyas Nagarpalika ward number 7. He first received treatment for gland TB from private clinic in Pokhara for about one month. Later he went to RTC Pokhara for free treatment. The RTC sent him to Damauli PHC to start his treatment. Mr. Basnet continued his treatment from Damauli PHC for about 4 months and felt that his glands were no more swollen and had no pain. At the mean time some of his friends advised him that the gland TB does not need such a long treatment like pulmonary TB. Then he thought that he was completely cured. So he stopped his treatment. Health workers from Damauli PHC sent him message through FCHV and some villagers requesting him to resume his treatment through. But he did not accept the request. When I met him, he said that he was feeling well and did not think he needed to continue the treatment any more. When asked him if he knew the recommended duration of treatment, he said that he had heard some instructions from health workers about the disease and treatment.*

The fourth case was defaulted from his treatment immediately after her intensive phase of treatment was over. Main reason for stopping her treatment was because all her *signs and symptoms of the disease were disappeared*. But she still *felt very weak* and thought that it could be due to the drugs she took during the intensive phase. At the mean time her husband and relatives also advised her to wait for few weeks before continuing rest of her treatment. Though she knew about the consequences of defaulting, she was hesitated to go to the hospital, as she was too late to collect her drugs.

#### **Case study 4**

*Mana Kumari BK (46) is from Bandipur VDC. She was diagnosed sputum positive pulmonary TB and was started category 1 regimen from Bandipur Hospital. During her intensive phase of her treatment she was admitted in the hospital as other patients did. When the intensive phase of the treatment was over, she was discharged from the hospital. She was given drugs for one week and was advised to come next week to take drugs. When she was discharged, she had no signs and symptoms of TB existed. But when she went home, she felt too weak to walk and work. Her husband advised her that she was too weak but was completely cured. Therefore she may not require more treatment. Yet she was willing to continue her treatment as the health workers explained her to take drugs for 8 months. When I met her with help of local people in Bandipur, she had not taken her drugs for last 2 months. She was also aware about the consequences of stopping treatment before completing the course. But she was hesitating to go to the hospital after a long period as the staff in the hospital might get anger with her being so late.*

#### **4.10 Perception of the health workers about DOTS program**

A total of 20 health workers working in the different TB treatment centers and the sub-centers were interviewed in order to assess their perception and knowledge about DOTS strategy and service provided through the DOTS program.

**Knowledge of health workers about DOTS program:** All of the health workers interviewed defined DOTS as watching of patient swallowing each dose of the TB drugs by somebody as all of them had learned this from same training and the training modules developed by NTP. Thus there was no variation in their definition of DOTS given by any health worker of the treatment centers. But according to WHO there is different meaning of DOTS and DOT.

According to WHO, DOTS is a strategy which consists of five major components such as political commitment, diagnosis of patients by sputum microscopy, treatment with standard Short Course Chemotherapy, regular supply of drugs and standard monitoring system. Where DOT is one of the five components i.e. simply watching of the drugs swallowed by the patients to ensure the treatment with the standard Short Course Chemotherapy.

**Problems encountered by health workers in implementing DOTS program:** Regarding the problems encountered by the health workers, most of them complained that more TB patients were getting relapsed despite the full course of treatment under DOTS strategy. Therefore, they doubted if the currently used TB drugs were effective enough for treatment. This was considered as a serious problem by the health workers in most of the treatment centers due to increased frequency of such cases. But I could not find adequate record in the district for verification of these complains. Other problems they expressed were that there was no clear defaulter tracing system, frequent change of the forms of TB drugs, increased workload for the health workers due to the DOTS program, patients' frequent complains about too many drugs to be taken, side effects and too large size of tablets. TB patients, most often also request for supply of drugs to their home for longer duration as they either have to travel a long distance every day or stay near by the treatment center for one dose of drug during their intensive phase of treatment.

Isoniazid (INH) and Ethambutol currently being supplied were quit similar in size and shape causing health workers and patients some confusion to recognize them. Rifampicin being supplied previously in the capsule form (with strip) was available in the form of tablet from last year. That caused patients some doubt about quality of drugs as capsule was generally considered to be better drug by most of the patients in the villages. This made health workers difficult to educate and convince TB patients.

Half of the health workers said that DOTS program had created more work for them and kept busier. They must be regular and should come earlier in the treatment centers every day for DOT. However, they said that since TB was part of their daily work it could not be felt an extra work. Some of health workers were worried that they were in risk of getting infected with TB from the patients, as they had to work closely with their patients for long period. They expected some preventive devices like mask from NTP.

**Alternatives of present DOTS strategy:** Regarding the priority of the health workers in types of DOTS that they suggested and was appropriate for districts like Tanahun, mixed views were found. Majority of them preferred the health institution based DOTS was better than the community based DOTS due to the poor supervision mechanism in the health system up to the community level presently. They thought that though the FCHVs were being utilized for DOT in some areas and could be done in the new areas as well, there was not so good supervision mechanism up to the village level from the health system to ensure that DOT done by the FCHVs in the community was reliable. They thought that most of the FCHVs were found to be very sincere and motivated, but some of the health workers argued that “how could one expect so much work from volunteers without any incentive?” Some of the health workers suggested that family DOTS could be an option for those who are from remote villages. All of the health workers agreed about the significance of supervision in any types of DOTS program in the community level for its reliability.

All health workers agreed that patients were much suffered due to the long distance to be traveled by them particularly those who were from remote areas. Among the health workers who preferred the health institution based DOTS justified that the potential side effects of the TB drug was very serious and required good management immediately as they thought was not possible in case of the community or the family based DOTS where only minimal training were provided to the FCHVs just to enable them doing DOT.

All the health workers expressed that they did not think any option of the existing DOTS strategy because it was the best of all the available strategies. However, they thought that it was necessary to modify the strategy so as to make it accessible to all people in the hilly areas like Tanahun. They thought that the DOTS program should be adjusted according to the context, that is DOTS program should expand to more HPs/ SHPs in case of Tanahun district. The main drawback of the present DOTS program as the health workers perceived was that many patients had to travel long distance during course of their treatment. It was much difficult to the patients particularly during the rainy seasons. Some of them suggested that mass health education and mass screening of the suspects in the each community would increase case finding and also could reduce the infections in the community.

**Satisfaction of the health workers about the DOTS program:** Most of the health workers interviewed, expressed that though there was no any motivating factors for the health workers such as performance evaluation, good salary and timely promotion for the health workers, most

of the health workers were found still satisfied with TB program so far, as there was provision of frequent training, meetings and observation visits organized for them compared to other programs. Better recording and reporting system for monitoring of the program in the peripheral to the central level and timely supply of the logistics was other positive aspect of the program to make them satisfied. Progress of their work being assessed in every 4 months through regular reporting system from the treatment center to the district, Region and up to the National level.

#### **4.11 Perception of FCHVs about DOTS program**

The FCHVs started doing DOT since 1996 in this district. According to the record of the treatment centers of Tanahun, though there were a total 19 FCHVs contributing in DOTS program doing DOT within last 8 months, only 15 of them were available for an interview.

Among the FCHVs interviewed their work experience as FCHV was ranged from 6 years to 12 years. Some of them were Traditional Birth Attendants (TBAs) before they were selected for FCHV. Among the FCHVs interviewed, 80% of them said that they became FCHV to serve their community. About 20 percent of them said that they became FCHV as per request of the villagers and to serve the community. Of the FCHVs interviewed the duration of DOT they did ranged from 5 months to 3 years (i.e. from the starting of the DOTS program in the district-1996). All of the FCHVs had done at least one day training on DOT within the district by DHO staff and JICA staff when DOTS program was initiated in 1996. Some of them also had received two days training.

Among the FCHVs interviewed, maximum number of patients done DOT were 13 and minimum 2 patients. The number of patients done DOT by the FCHVs was depended upon the number of patients diagnosed from the respective area of the FCHVs.

All of the FCHVs were found called their patients to their (FCHVs') home for DOT unless the patients were unable to walk up to her home. In special conditions, FCHVs needed also to go to the patients' home. However, all the TB drugs supplied by the treatment center were kept with her. The time taken to do DOT for a patient per day according to them was 5- 10 minutes.

All of the FCHVs said that the time and place for doing DOT was always discussed with the patients at the beginning of the treatment. Out of the FCHVs interviewed 9 of them said that they decided time for DOT jointly discussing with their patients. Out of the 15 FCHVs

interviewed, only 2 FCHVs used to do DOT in the late morning, rest of all preferred early morning, as both patients and the FCHVs had to go for their work early in the morning after the DOT. When the FCHVs had to go away from their home for some time they assigned one of the members of their family to do DOT during that period. However, it was rarely needed.

FCHVs or the patients themselves collected either TB drugs from the treatment centers on a weekly basis as per mutual understanding between them. Three of the FCHVs said they were receiving full bus fare from their patients to go to the treatment center to collect the TB drugs. Two of the FCHVs said they were offered partial bus fares from the patients. Others mentioned that they refused to take any money with their patients considering their economic status.

The time taken to bring drugs from the treatment center for the FCHVs was ranged from 30 minutes to 5 hours in each visit. If the FCHVs go for drug to the treatment center, she needed to take a card of her TB patient. The health worker then kept record in the name of the patient and drugs were supplied for one week. Relationship between health workers and FCHVs was very good according to all FCHVs and the health workers interviewed. Some of the FCHVs also helped health workers in distribution of drugs and patient education in the treatment centers when they were visited there.

The FCHVs were asked about perception of their family members about their involvement in DOT. Six of them said their family members were not always happy with the FCHVs' voluntary work, 4 of them said that their family members were not happy at all and 5 of them said they had good supports from their family.

Regarding the relationship between the TB patients and the FCHVs, all of the FCHVs said that TB patients loved all of them. There was always mutual understanding between FCHVs and the patients. Nine of the FCHVs said that they were facing problems while doing the DOT, the main problems being consumption of more time while going to the treatment centers every week for the drug. But 6 of them said that they did not feel any problem, as doing DOT is religious duty for them.



Regarding their feeling about continuation of their service doing DOT in future, 11 of them were happy to continue DOT until they can do or they are asked by treatment centers to do despite their existing problems. However, 4 of them said that they were uncertain about the future.

**Satisfaction with doing DOT:** Out of 15 FCHVs interviewed, 9 of them said they were highly satisfied and 6 were moderately satisfied by doing DOT. The main reasons for satisfaction was that they could contribute to cure TB patients, which they take as their greatest achievement and that was the main reasons for satisfaction. As FCHVs, they had no role in curative treatment in other disease like in TB. Once the patients were cured with their efforts, the patient as well as people in the community started to give them more respect that made them satisfied.

When they were asked, if some body else could do DOT beside the FCHVs in their community, eight of them said that they did not think other people could do it as it was a completely voluntary work. So, no one would like to work voluntarily like they were doing without any incentives. Three of the FCHVs said some people in village could do DOT if proper training is provided. Other 4 FCHVs said they had no idea about the appropriate person. However, they thought that no male volunteer would do this type of work in the village.

At the end of the questionnaire the FCHVs were asked for some suggestions about the DOTS program. But out of the 15 FCHVs only 10 of them gave their suggestions. The main suggestions they gave were as follows:

- There should be provision of uniform for the FCHVs to wear when they come to treatment center, which could help identify them as FCHVs.
- Some vitamins should be supplied for the TB patients through them as the patients usually complained of some side effects and weakness.
- DOTS program should be expanded in more villages to facilitate the patients to increase accessibility.
- HMG should appreciate and give good recognition of works of the FCHVs.
- They should receive frequent training about DOT.
- TB treatment centers should provide good patient education to the TB patients.

## 5. Discussion on the findings

Tuberculosis is an old disease, which continues to pose major public health challenges to developing countries. Though it is now possible to cure and control TB, it still affects and kills millions of people every year. While industrialized countries managed to control TB, the picture in Asia and Africa is grim.

DOTS is a strategy for ensuring that every patient who starts TB treatment gets the best chance of being cured. It is an internationally recognized health care management system, which can be integrated effectively into comprehensive PHC service. DOTS is the patient centered approach which was first implemented in Nepal in 1996 introducing in 4 national demonstration areas within the country.

DOTS strategy can be successfully implemented in phases in large countries with a high tuberculosis burden. This success is due to decentralizing sputum microscopy and treatment delivery services to peripheral health facilities utilizing the existing PHC network. High cure rates can be maintained despite rapid expansion of coverage, with proper implementation of the strategy and regular monitoring of reports on case finding, sputum smear conversion and treatment outcome. Case detection needs to be further increased by informing and involving the community in TB control efforts through social mobilization.<sup>26</sup>

Since the objective of this study is to assess the level of satisfaction of both TB patients and health service providers (health workers and FCHVs), in order to assess the perception, interviews were conducted among those respondents using separate questionnaires for each category. Though the DOTS strategy is considered to be the most effective of all other strategies of TB control, there are various influencing factors to make it effective both from service providers and patients' perspectives. Therefore, TB patients and service providers were selected as respondents for this study to assess those factors. The finding main findings of the study on the basis of data collected by interview and observation methods are tried to briefly discuss.

**General overview of the DOTS program in Tanahun district:** Tanahun is one of the 16 districts of Western Development Region of Nepal with population of 318,944<sup>(28)</sup>. In Tanahun

district, DOTS was implemented in the 4 treatment centers by support of the JICA/ TB control Project in 1996. In the same year, in order to increase access for the patients coming from remote villages of the district, further HPs/ SHPs and FCHVs were also used for treatment supervision after providing necessary training. At the time of my visit for data collection, there were four main TB treatment centers assisted by number of HPs/SHPs and FCHVs for treatment supervision of the TB patients during intensive phase of their treatment. In the study area, there were altogether 175 TB patients registered for treatment where 9 of them had defaulted. Of them, altogether 94 patients on treatment, 4 defaulters, 20 health workers and 15 FCHVs were interviewed.

**Knowledge of TB patients about TB and its treatment:** In order to assess the level of knowledge of the respondents, ten different TB related questions were asked. On analysis, the respondents were found with good knowledge about TB and its treatment in general. However, they were found relatively less aware about frequency of sputum examination and route of transmission of TB. Main source of information about TB, its treatment and DOTS was found to be their respective treatment centers and some respondents also had got information from private practitioners, relatives, friends and hospital outside the district.

On my observation, during the data collection, in most of TB treatment centers, health workers were found explaining the patients about different aspects of treatment while they dispensed TB drugs. That was what the health workers could do for educating their patients depending upon the time available to them. However, that may not be adequate for each and every TB patients depending upon level of their existing knowledge and individual differences. Appropriate and effective health education is necessary to improve the effectiveness of the strategies employed in TB control. Health education to the patient is not instructions nor teaching but motivation. It requires the understanding of the patients' problem fears and wants. For this, first of all the health workers must be motivated. It is self evident that talking and listening to the patients cost nothing but time. Therefore, there should also be enough time available to the health workers for quality health education. That can contribute to reduce many of the factors responsible for poor compliance and defaulting from treatment. If an effective health education could be provided to the patients right from beginning of their treatment, that can prevent extra-cost for defaulter tracing activities. Which was one of the problems for TB program in Tanahun district.

According to a study done in Malaysian teaching hospital the newly diagnosed TB patients had limited knowledge about TB. One of the misconceptions among those patients was that sharing eating utensil spreads TB, and nearly half of the patients had avoided eating with their family for fear of transmitting the disease. In this study educational background of the patient was an important determinant of patients' level of knowledge of TB, those with a higher level of education scored better than those of with lower or no formal education.<sup>32</sup>

**Alternatives for existing DOTS program as suggested by TB patients:** Regarding the alternatives of existing DOTS program suggested by the respondents, 46% of them preferred health institution based DOTS and rest 52.2% preferred community and family based DOTS. The reasons for preferring health institution based DOT was mainly due to more faith of patients with the health workers and the health institution being closer to their home. Whereas reasons for preferring the community and family based DOTS was due to long time that they had to spend while coming to the treatment centers for service, travel cost and the physical hardship in walking long distance for long period of time during their treatment.

According to WHO report 1997, there are only few examples of community-based organizations and NGOs successfully implementing the DOTS strategy. BRAC, a national NGO in Bangladesh recently implemented the strategy to a population of nearly 7 million people and is already achieving cure rate of 80%.<sup>22</sup>

According to a study done in Thailand, most clients with low socio- economic status and health providers perceived health center based DOTS to be impractical due to transportation cost, too sick to travel, daily work and child care responsibilities. Hence the clients preferred the home based DOT. But female clients holding higher social status refused daily home visits by the health workers due to stigma.<sup>27</sup>

Though hospitalization is considered to be the best method for DOTS there are not enough beds available in our country and is also very expensive. In the Scandinavian countries all TB patients are treated by hospitalization. This is why they have very high cure rate (96%). In the context of Nepal limited options of DOTS are available due to difficult terrain, sparse distribution of the health care infrastructure and lack of resources in general.<sup>13</sup>

The only proven way of ensuring adherence and achieving WHO global target is through Directly Observed Treatment. In some settings in some countries, other ways of closely supervising treatment have been tried. No developing country has so far demonstrated countrywide application of ways of supervising self-administered treatment under program condition, with success rates equaling those of direct observed treatment, or achieving WHO targets.<sup>16</sup>

#### **Alternatives of existing DOTS program as suggested by the health workers:**

According to suggestion given by majority of health workers of Tanahun, most appropriate person to be a treatment supervisor in the community were FCHVs over VHWs, TBAs and others.

The FCHVs involved in the DOTS program in Tanahun were really motivated. Some times one can ask why they were so dedicated despite no incentive. The contribution of FCHVs is highly appreciable and it could be sustained with introducing appropriate supervision system, some kind of incentives, regular meetings, refresher training and other relevant measures. VHWs are the paid health workers and are responsible for carrying out varieties of work within a VDC. They are also accountable for the entire health program in the community level. However, it seems impossible for them to do DOT covering entire wards of a VDC. But they could be developed and mobilized as a community level supervisor or coordinator for various health activities including DOTS program.

In Ghana, regular home visit by liaison staff, even though they had little medical knowledge and general education, improved compliance significantly. It was noted that success depends on the commitment and determination of the liaison worker, which was often very high.<sup>33</sup>

**Perception of TB patients about the DOTS program:** About the perception of respondents regarding time spent while visiting treatment centers, 53.2% of the respondents were spending more than one hour in each visit. About 65% of the respondents expressed that the most acceptable duration of time for them was less than 10 minutes in each visit.

The walking time and distance to be traveled for treatment is one of the major constraints for successful DOTS program. Although TB drugs are given free to the TB patients there is no compensation for the cost of income and the cost of travel. These expenses often exceed the

available resources of the individuals and their families, which could result in a variety of non-compliant behaviors. Long home -to- treatment center distance is a well-recognized risk factor for non- compliance, especially if the patient have to pay their transport indeed transport cost may exceed the cost of the drugs.

About 37% of the respondents expressed that they had to wait when they visited to the treatment center for service. Among the respondents who needed to wait, the maximum time to be waited was less than 30 minutes, average time for 89.6% of the respondents to be waited in each visit was less than 20 minutes.

Waiting time is one of the potential factors for poor compliance for TB patients. On my observation, health workers in the treatment centers were found trying their best to reduce the waiting time of the patients. Patients were found to have waited for more length of time especially at the beginning of the treatment to get the sputum result. But once the treatment is started, there were not many reasons for making the patients waited. The responsible health workers during our visits in all the treatment centers were found fully involved in the distribution of drugs and providing health education until all the patients were finished coming. The interview with the health workers also revealed that sometimes the patients needed to wait due to rush particularly when there was less staff available due to leave or their involvement in the other outreach activities. In Damauli PHC and Khairenitar Health Post, number of CMA students who were on- the- job training were helping the health staff run DOTS and other activities.

The proportion of respondents who suffered from side effects of the TB drugs was 21.3% and the health workers of the respective treatment centers treated most of them. For few cases of the severe types of side effects patients were referred to hospitals in Pokhara or Kathmandu.

According to WHO guidelines,<sup>34</sup> most TB patients complete their treatment without any significant drug side effects. However, a few patients do develop side effects therefore it may require clinical monitoring of all TB patients becomes important during TB treatment. But routine laboratory monitoring is not necessary. The health workers can monitor patients for drug side effects by teaching them how to recognize symptoms of common side effects and to report

if they developed such symptoms and asking specially about these symptoms when they see the patients at least monthly during treatment.

**Perception of TB patients about health workers:** Majority (81.9%) of respondents reported that the health workers listened to them when complained about their problems and 78.7% of them also reported that the health workers responded them patiently.

Studies have shown that patients are more satisfied and more likely to comply with medical advice when they believe the physician or health service providers has dealt adequately with their problems. Also on my observation health workers seemed friendly with patients. The health workers most of times were busy with talking and answering questions of the TB patients.

Out of 175 patients registered for treatment for last 8 months, 9 patients were found defaulted from their treatment where 4 of them were interviewed. The finding suggested that there were number of reasons for defaulting from their treatment mainly being feeling of well being even with incomplete treatment, feeling weakness due to drug, not getting cured soon as expected by the patients, lack of knowledge about correct duration of treatment etc.

Usually patients are blamed for poor adherence of their treatment. But is not always true. Patients are always trying to get cured soon. He/she comes to the treatment center to diagnose the disease and get most effective treatment to get rid of the disease as soon as possible. The main factors influencing treatment completion are the characteristics of the health service- and not the characteristics of the patients.

The direct observation of treatment, adapted to patients' needs and to the working conditions of health care workers, is certainly the best method of avoiding treatment interruption. However, even with direct observation of treatment, there may be treatment interruption due to number of reasons associated with the service providers and the patients. These factors could be minimized by an effective and regular health education to the patients by the health service providers particularly in the beginning of the treatment. Health workers should provide most essential information to patients at the time of diagnosis about TB using this as a good opportunity to educate them about the importance of completing the full course of treatment and also about the

risk of not doing so may result in the development of multi- drug resistant and recurrence of the disease.

According to a study done in Cape Town, 85% of cure rate was not achieved there despite excellent microscopy, an uninterrupted supply of drugs, and well trained staff mainly due to treatment interrupted by the TB patients mostly in early in treatment.<sup>16</sup>

**Satisfaction of TB patients about DOTS program:** Despite various problems related to patients and the health service providers discussed above, higher proportions of respondents (TB patients) were found satisfied with their treatment supervisors (98.9%) and the services provided by them (86.2%). When the level of satisfaction was analyzed and ranked most of the respondents were fully satisfied with their treatment supervisors and with the overall service.

Most important to successful TB treatment is the patients' sense of well being as he or she walks the long road toward cure. The health service must make this road as easy to travel as possible. Health workers need to gain patients' confidence and put them at ease by being courteous and communicating well. Time spent with the patient to identify the best supervisor helps to ensure that the patient will complete treatment. TB patients are always worried when the health workers first tell them about their disease after diagnosis. But if they are well explained and assured about its treatment clearly, they can be happy with the health workers. Behavior of the health workers to the patients is essential for satisfaction that results in successful completion of the treatment. The treatment supervisor is the key person in the DOTS program who is contacted by the patients every day for the first two months of their treatment. In case of DOTS program of Tanahun there are health workers and FCHVs as treatment supervisors. Both of these categories of health service providers were very much dedicated and were found providing good service to the patients. As a result patients were satisfied with the treatment supervisors and the service they provided.

**Satisfaction of health workers about DOTS program:** Regarding satisfaction of the health workers with the DOTS program, though there was not so many motivating factors for the health workers as they mentioned, such as performance evaluation, good salary and promotion to the higher level, most of the health workers were found still satisfied with TB program. The main reason for satisfaction was that there was frequent training, meetings and observation visits



organized for them compared to other programs. Better recording/reporting system for monitoring in the different levels of the TB program was other positive aspect of the program to make them satisfied. In the TB program, progress of their work was being monitored in every 4 months with regular reporting system of NTP that helped them to assess how well they were performing.

According to experience expressed by a director of one of the District Community Hospital in Thailand, the health workers in the treatment centers at the beginning of the DOTS implementation were reluctant to take on the responsibility of supervising medication as they felt it would be too much of burden to them. However, after some times, once they became involved in the program, they realized that they could cure patients within a short period of time. They rapidly changed their negative attitudes into positive. The field workers also showed that DOTS was boosting their skills in TB care that was not present earlier. For example, health workers were gaining an excellent understanding of their patients. They could observe drug reactions much earlier, manage them and thus encourage the patients to be fully comply on treatment for the required duration. Those achievements had corrected considerably self-esteem and pride amongst the health workers, particularly because their superiors and their patients recognized and applauded their work. The NTP in Thailand had done much progress in 5 years. It has developed standard training materials, recording and reporting system, organized different workshops, training, meetings and formed different local committees. These activities have played crucial roles in improving the TB program in the different level including motivation of the health workers.<sup>26</sup>

Most of the health workers in Tanahun district liked the principle of the DOTS strategy. They were concerned about the patients who were from the remote village of the district due to their inconvenience to receive service. They suggested for increasing more treatment centers and sub-centers of DOTS within the district in order to increase access. However, it is up to the health service or NTP whether or not it can be expanded DOTS program in further up to the community level soon.

Using methods of DOTS that is acceptable to the providers and the patients can raise the low cure rate. Acceptability, affordability, and accessibility of the treatment will increase the adherence of the patient to the treatment and thus the cure rates in the NTP will be raised. The

present strategy of the DOTS seemed that TB patients are compelled to use the service provided by the health providers no matter whatever troubles they may have to face. The DOTS strategy is flexible according to different contexts. Any country or community can adapt the DOTS strategy according to its own situation without changing its main guiding principles. But the problem is that we do not have many options for those patients making the service more accessible, acceptable, feasible and affordable is the responsibilities of the health system of the country. Therefore, it is necessary to improve the existing program considering difficulties of the TB patients. The most appropriate strategy for making the service more accessible, acceptable and affordable can be merely by increasing the number of treatment centers, training health workers, expanding microscopy facilities for diagnosis, providing regular supply of the TB drugs, and establishing a regular supervision system.

Most of the health workers appreciated the contribution of the FCHVs in the DOTS program. But some of them doubted about the quality of the DOT they were doing, that there was no regular supervision mechanism up to the community level to ensure the quality of the DOT being done by the FCHVs. They felt that the health institution based DOTS program is better than the community based DOTS unless regular and quality supervision mechanism up to the community level is established.

DOT is being done in the health posts, sub- health posts and in the certain communities by the FCHVs but there was no regular supervision from the district level to those level as the responsible supervisor for the TB program was unable to make supervisory visits frequently due to his extra responsibilities in the other programs (i.e. statistics and EPI activities). Similarly, there was no regular supervision from health post to sub- health posts and up to the community (FCHVs) level.

I personally think that it is not so easy task to do supervision in the community level according to our present health system and the resources. The contribution of FCHVs in providing DOTS is more than expected and need to keep continue by providing necessary supports from both health system and from the community. Health workers should trust their quality of work if it can not provide supervision up to the community level. The regular follow up sputum is also considered to be a good method for checking quality of DOT in any DOTS program and which is regularly being done by the microscopy centers in all the 4 centers.

The FCHVs interviewed were found highly motivated. Though there was no incentive for them, they were still motivated for doing DOT. That was mainly due to the fact that their community gave them better status and respect if they did curative treatment to the people. There was no opportunity in other diseases for FCHVs to provide curative treatment to the patients in the community with drug like in the TB. After all, successful cure of the TB patient is the main reason for their satisfaction in DOTS program. Some of the FCHVs were receiving some money to cover travel cost when they go for collecting drugs in the treatment centers. That was one of the good examples of community participation and could be helpful to sustain community based DOTS program. This should be promoted by the health system. But the majority of those FCHVs did not mention they received any money from the TB patients.

This kind of practice is determined by mutual understanding between the FCHVs and the patients where the health service authority can not suggest directly to the patients to pay money for the service. It is very good to use the local health volunteers in the DOTS program. However, there are certain things to be considered from both health service and the volunteers' sides. To contribute in the DOTS program, simply watching the each dose of the TB drugs for 2 months of the treatment. They have to spend more times in collecting drugs from the treatment centers every week. The distance they had to travel was same as that of the TB patients. The general socio-economic status of the FCHVs may not be much different from that of the TB patients. Being health volunteers, FCHVs do not receive any incentive from the health service except training and small training allowance, which is very rare. Therefore we can not expect them to be accountable for the service. The status given by the community alone would not be sufficient for every FCHVs to continue their service for long run in future. So, there is question of sustainability of DOTS by community volunteers without any enable and reinforcing factors either from community side or the health service side.

### 6. Conclusion and recommendations

#### 6.1 Conclusion

- The service of DOTS program was inadequately covered in the district where only one HP, 2 PHCs and one hospital were serving as TB treatment center for population of the whole district. Remaining 12 HPs and 31 SHPs were supporting only partially to the 4 treatment centers by doing DOT.
- Most of the respondents had good knowledge about TB, its duration of treatment, rationale of DOT, route of transmission, reason for examination of sputum during treatment and consequences of defaulting from treatment. The main source of TB related information for the respondents was health workers of the TB treatment centers.
- The proportion of respondents preferring community based DOTS program (both community based and family based combined) and health institution based DOTS program was slightly different (52.1% and 46.9% respectively).
- More than 50% of the respondents had to spend more than 1 hour for travelling when they go for service to their nearest treatment centers. Majority of the respondents preferred less than 10 minutes of time as their most acceptable time for the service and most (68.1%) of the respondents liked daytime as their convenient time for taking drug (DOT). Only 37.2% of the respondent had to wait in the treatment centers and the maximum of time to be waited in each visit was less than 30 minutes.
- About 21% of the respondents had experienced mostly minor side effects of the TB drugs and most of them who experienced those side effects were managed by their respective treatment centers.
- Behavior of the health workers (in terms of listening to the patient's problems and dealing with them) was found good by most of the respondents.

- Quite high proportions of the respondents were fully satisfied both with the treatment supervisors and the overall service provided by them. Level of satisfaction of the respondents with treatment supervisors and overall service was not found associated with the travel time, waiting time in the treatment centers, and behavior of the health workers.
- Most of the health workers were satisfied with the TB program due to regular training, meetings, observation visits, timely supply of logistics, regular evaluation and monitoring of TB activities which were being used to assess their achievements regularly. Most of the health workers liked the health institution based DOTS better than the community based DOTS program due to lack of supervision mechanism up to the community level at present.
- Most of the FCHVs involved in the DOTS program were found satisfied with the work they were doing because curing of the patients with their efforts was the main reason for their satisfaction. Respect given to them by their community was also higher due to their contribution in the DOT as curative treatment. Most of the FCHVs liked to continue assisting in the DOTS program despite their personal problems and lack of incentives for their contribution.

## 6.2 Recommendations

1. Considering the inconvenient of the TB patients for the service increasing the number of the treatment center is necessary. Concerned authorities are recommended for expansion of more treatment centers as soon as possible.
2. The proportion of the relapse and failure case of TB was in the increasing trend throughout the program-implemented area despite the DOT. Therefore it is recommended to concerned authorities for further study on possible factors responsible for the increasing number of relapse and failure cases as soon as possible.
3. According to most of the health workers interviewed, TB drugs (Ethambutol and INH) supplied were quite similar in size, shape and color. Which caused them confusion to recognize and differentiate in order to teach to the patients. Rifampicin was previously in the capsule form but it was now in the tablet form in the most recent supply. That made the health workers difficult to convince the patients. Therefore, the concerned authorities are

recommended to develop and provide an appropriate health education package to educate patients about the drugs being used.

4. In all of the treatment centers, health workers complained (also showed) about the damaged Ethambutol, which was being supplied from RTC Pokhara. Therefore, the concerned authorities are recommended to assess the condition of drug in the field level and supply good quality or undamaged Ethambutol tablets.
5. Though the position of the DTLA was fulfilled temporarily by the EPI supervisor/ Statistician Assistant, he was unable to visit all the treatment centers as required due to extra responsibility to him. Therefore, the concerned authorities are recommended to fulfill the position of the DTLA as soon as possible.
6. Though there was unclear defaulter-tracing system in the DOTS implemented areas, health workers were trying to trace the defaulters by using different possible ways. Which was not so effective. There was no specific health worker responsible for defaulter tracing. Therefore, the concerned authorities are recommended to specify the health worker who will be responsible for defaulter tracing. The concerned authorities are recommended to develop a clear defaulter tracing system and include it in the job description of a particular health worker.
7. FCHVs had played very important role in success of the DOTS program. In order to maintain their motivation and keep them working, the concerned authorities are recommended to explore some possibilities to sustain the present contribution and provide an appropriate training and incentives for their contribution in certain interval of time based on their performance.
8. The health posts/sub health posts were given option for doing DOT before patients were sent there from the treatment centers asking them if they could do DOT to the patients who come from that area. The concerned authorities are recommended to make all health posts compulsory to do DOT if the patients are from that HP/SHP area. That will help to increase the access for the patients who come from remote areas of the district.

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Questionnaire for TB patients on their perception about DOTS program

Interviewer's Name: -----  
 Date of Interview: -----  
 ID Number of Patient: -----  
 Name of the respondent: ----- Age: ----- Sex: -----  
 Address of the respondent: VDC----- Ward Number-----

1. Marital status:
  - a. Married  [ ]
  - b. Single  [ ]
  - c. Separated  [ ]
  - d. Divorced  [ ]
  - e. Widow/widower  [ ]
2. Type of family:
  - a. Nuclear  [ ]
  - b. Joint  [ ]
  - c. Extended  [ ]
3. Ethnic/caste:
  - a. Brahmin  [ ]
  - b. Chhetri  [ ]
  - c. Magar/Gurung  [ ]
  - d. Others  [ ] (please specify).....
4. Occupation:
  - a. Agriculture  [ ]
  - b. Business  [ ]
  - c. Service  [ ]
  - d. Labor  [ ]
  - e. Student  [ ]
  - f. Others  [ ] (Please specify).....

5. Educational status:
- a. Illiterate
  - b. NFE completed
  - c. Up to class 5
  - d. Class 6 to 10
  - e. SLC & above
6. Religion:
- a. Hindu
  - b. Buddhist
  - c. Muslim
  - d. Christian
  - e. Others  (specify) -----
7. Type of TB
- a. Smear positive
  - b. Smear negative
  - c. Extra pulmonary  please specify-----
8. Registration category
- a. New case
  - b. Relapse
  - c. Treatment failure
  - d. Returned defaulter
  - e. Transfer in
  - f. Other case
9. Treatment category
- a. Category I (sputum positive new)
  - b. Category II (Re-treatment cases)
  - c. Category III (Sputum negative and extra-pulmonary)
  - d. Others
10. Phase of the treatment
- a. Intensive phase
  - b. Continuation phase
11. From how long are you under treatment? (In months)
12. Which disease are you taking treatment for?
- a. TB
  - b. Others (Specify)...
13. How long should you have to take treatment for curing TB?
- a. More than 8 months
  - b. Less than 8 months
14. Is TB a communicable disease?
- a. Yes
  - b. No

15. If it is communicable disease, how does it transmit?  
a. By respiration      b. by food  
c. By utensil          d. Others
16. How often should the sputum be examined during your treatment?
17. Why should sputum examined?
18. Does the drugs have any side effects?  
a. Yes                      b. No                      c. do not know
19. Did you ever have any side effects with the TB drugs?  
a. Yes                      b. No
20. If yes, where did you go for treatment of the side effects?  
a. TB treatment center      b. District hospital  
c. Didn't do anything
21. How did you know the above information?  
a. From treatment centers      b. from radio  
c. Self                      d. Others (specify)...
22. Why do you think TB treatment needs direct supervision?
23. How long does your treatment need directly supervised by your treatment supervisor?  
a. 2 months                      b. More than 2 months (specify)  
c. Less than 2 months (specify)...
24. Where do you swallow TB drug during intensive phase of your treatment?  
a. In front of health worker (treatment supervisor)  
b. Away from the treatment supervisor  
c. Wherever I like
25. How often do you go to TB treatment center/ treatment supervisor during intensive phase of treatment)?  
a. Daily                      b. twice a week  
c. Once a week                      d. not fixed  
e. Others (please specify)...
26. How often do you go to treatment center/ treatment supervisor to collect your drugs during last 6 months of treatment (continuation phase)  
a. Once a month                      b. every week  
c. Once in every 2 weeks                      d. No fixed time

27. Where do you swallow your medicine on the day of collection during continuation phase?  
a. At home                      b. at the treatment center  
c. Others (please specify)...
28. How much of your time does it consume altogether while you go to your treatment center/ treatment supervisor in each visit?  
a. Less than 15 minutes              b. 15 to 30 minutes  
c. 30 to 45 minutes                      d. More than one hour
29. What do you think about this much distance in terms of your convenience and time consumption?  
a. Not so far                      b. Bit far but still manageable  
c. Too far (not manageable)
30. How do you receive TB drugs on holidays from the treatment center?  
a. The treatment center supplies an extra dose for the holiday  
b. TB patients must go to the treatment center even on the holiday  
c. Miss the dose on the holiday  
d. Others (please specify)...
31. Is the time available for your daily dose from your treatment center/ treatment supervisor convenient for you?  
a. Yes                                      b. No
32. If no, why?
33. Was ever the treatment center closed when you go there for your treatment?  
a. Yes                                      b. No
34. If yes, what did you do in that situation?
35. Did it ever happen that there was no medicine in the treatment center when you go for your treatment?  
a. Yes                                      b. No
36. If yes, what did you do then?
37. Do you have to wait for your drug in the treatment center/ treatment supervisor when you go for treatment?  
a. Yes                                      b. No
38. If yes, how long (average)?  
a. Less than 10 minutes                      b. 10 to 20 minutes  
c. 20 to 30 minutes                              d. More than 30 minutes

39. Are you happy with your treatment supervisor?  
a. Yes b. No
40. If no, why?
41. If yes, to what extent are satisfied?  
a. Fully satisfied b. moderately satisfied  
c. Less satisfied
42. Do the health workers teach you well about your disease and its treatment?  
a. Yes b. No
43. Do the health workers in the treatment centers listen your problems and patiently?  
a. Yes b. No
44. Do the health workers answer your questions patiently?  
a. Yes b. No
45. Have you ever been disappointed with the service and behavior of the health service providers?  
a. Yes b. No
46. If yes, why?
47. Are you satisfied with services provided by the treatment centers/ treatment supervisors?  
a. Yes b. No
48. If yes, to what extents are you satisfy?  
a. Fully satisfy b. Moderately satisfy  
c. Less satisfy
49. If no, why?
50. Where do you give more preference to have your TB treatment?  
a. Health institution b. Community.  
c. At home d. Private practitioners
51. If health institution, why do you prefer health institution?
52. If community why do you prefer?
53. If at home, why do you prefer?

54. Whom do you give more preference to be your treatment supervisor in the community?
- a. FCHV
  - b. VHW
  - c. TBA
  - d. Others (please specify)...
55. Maximum of how far from your home the treatment supervisor/treatment center should be for you convenience (time wise)?
- a. Less than 10 minute
  - b. 10 to 20 min.
  - c. 20 to 30 min.
  - d. Less than 1 hour.
56. What is your most convenient time for DOT?
- a. Morning
  - b. Evening
  - c. Day
57. At what time are you taking drugs now?
- a. Morning
  - b. Evening
  - c. Day
58. Do you like to give any suggestions or comments about the DOTS program?

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Questionnaire for defaulters of TB treatment on their perception about DOTS

Interviewer's Name: -----

Date of Interview: -----

ID Number of Patient: -----

Name of the respondent: ----- Age: ----- Sex: -----

Address of the respondent: VDC----- Ward Number-----

1. Marital status:
 

a. Married	[ ]	[ ]
b. Single	[ ]	[ ]
c. Separated	[ ]	[ ]
d. Divorced	[ ]	[ ]
e. Widow	[ ]	[ ]
  
2. Type of family:
 

a. Nuclear	[ ]	[ ]
b. Joint	[ ]	[ ]
c. Extended	[ ]	[ ]
  
3. Ethnic/caste:
 

a. Brahmin	[ ]	[ ]
b. Chhetri	[ ]	[ ]
c. Magar/ Gurung	[ ]	[ ]
d. Others	[ ]	[ ]
  
4. Occupation:
 

a. Agriculture	[ ]	[ ]
b. Business	[ ]	[ ]
c. Service	[ ]	[ ]

- d. Labor [ ]  
e. Student [ ]  
f. Others [ ]

5. Educational status:  
a. Illiterate [ ]  
b. Up to class 5 [ ]  
c. Class 6 to 10 [ ]  
d. SLC & above [ ]

6. Religion:  
a. Hindu [ ]  
b. Buddhist [ ]  
c. Muslim [ ]  
d. Christian [ ]  
e. Others [ ] (specify) -----

7. Type of TB  
a. Smear positive [ ]  
b. Smear negative [ ]  
c. Extra pulmonary [ ]

8. Registration category  
a. New case [ ]  
b. Relapse [ ]  
c. Treatment failure [ ]  
d. Returned defaulter [ ]  
e. Transfer in [ ]  
f. Other case [ ]

9. Treatment category  
a. Category I (sputum positive new) [ ]  
b. Category II (Re-treatment cases) [ ]  
c. Category III (Sputum negative and extra-pulmonary) [ ]  
d. Others [ ]

10. Are you taking any treatment now?  
a. Yes [ ]      b. No [ ]

11. If yes, from where?

12. When did you start the treatment?

13. Did the health workers teach you about TB and its treatment before you started treatment?  
14. Can you please explain what are the things to be remembered during TB treatment?



15. Can you also explain what happens if you stop treatment at the middle of the treatment period?
16. Why did you stop your treatment?
17. When did you stop your treatment?
18. Did some body advise you to resume the treatment?
- a. Yes                      b. No
19. If yes, who advised?
20. How many times did he/ she came for advice?
21. Why did you not accept the advice?
22. Do you think you will resume your treatment?
- a. Yes                      b. No
23. If yes, in what condition will you continue the treatment?
24. If no, how would you be get cured?
25. How was the services provided by the treatment center?
26. How was the behavior of the health workers treatment supervisors?
27. What would you advice to improve the service?

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Questionnaire for Health Workers about their perception about the DOTS program.

Name of the treatment center:-----

Name of the respondent: -----Post: -----

Name of the interviewer: -----

Date of interview: -----

1. How is the TB activity under your health institution running?
2. What do you think about the DOTS strategy of the TB program?
3. Do you think the DOTS strategy is really a solution for TB problem?  
a. Yes                      b. No
4. If yes, how?
5. If not, why?
6. How do you define DOTS?
7. Do you think DOTS is important?
8. If yes, why do you think so?
9. What are the problems you have faced while carrying out the DOTS program through your institution?
10. Has DOTS created extra work for you?
11. You have community based and health institution based DOTS, which one do you prefer more on the basis of convenience of TB patients and you as a service provider?

12. Why do you prefer it?
13. Besides the above-mentioned types of DOTS, do you know any other appropriate strategies of DOTS for the hill districts like Tanahun?
14. If yes, what type of DOTS?
15. How do you provide TB treatment to those who are from remote places from the treatment center?
16. During first 2 month of treatment how do you provide daily DOT to the TB patient on Saturday or other short holidays?
17. How do you provide DOT on long holidays like Dashain and Tihar?
18. Do the TB patients ever complain about the service that you provided?
19. If yes, what are their usual complaints about?
20. Do you have any defaulters of TB treatment?
  - a. Yes
  - b. No
21. If yes, what may be the reason?
22. Who is responsible for defaulter tracing?
22. Has defaulter-tracing being done properly by him/her?
  - a. Yes
  - b. No
23. Are you getting enough supports from DHO to run the TB program smoothly?
24. If no, what is the reason?
25. If no, what may be the reason?
26. Who supervise you in TB program from DHO?
27. Is the supervision from DHO regular and timely?
28. If no, what may be the reason?
29. What do the supervisors actually do when they come for supervisory visits in your treatment center?
30. Has the supervision been useful for your work in the TB program?

31. Have you received any training on DOTS?  
a. Yes                      b. No
32. If yes, how long was the training?
33. How many times did you receive it?
34. Do you have enough drugs and other supplies required for TB program?
35. If no, What may be the reason?
36. Are there any private practitioners in your area?  
a. Yes                      b. No
37. If yes, do they treat TB patients?
38. How do they get treatment from the private practitioners?
39. How do you manage TB treatment if the patients with incomplete treatment from the private practitioners come to your treatment center?
40. What do you think about the private clinic and the TB treatment?

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**Department of Community Medicine and Family Health**  
**MPH Program, 2056**

Questionnaires for FCHVs about their perception about DOTS program

Name of the FCHV: -----  
Village Development Committee: -----  
Corresponding TB treatment center: -----  
Name of the interviewer: -----  
Date of interview: -----

1. When did you become FCHV?
2. Why did you like to be FCHV?
3. When did you start doing DOT?
4. Did you receive any training before you started doing DOT?
5. Altogether how many training on DOTS have you completed?
6. How many patients are there on DOTS under your supervision and how many have completed their course with your supervision?
7. Where do you do DOT in your community?  
a. At your home    b. at patients' home  
c. Others...
8. What is the usual time of doing DOT?
9. Who fixed the time for DOT?
10. How is DOT done when you are not at home?

11. Does doing DOT affect in your day to day personal work?
12. How long does it take to do DOT for each patient/day?
13. How often do you go to the treatment center for drugs?
14. How long does it take to reach and come back home from the treatment center?
15. How are the TB drugs received from the treatment center?
16. How are the co- operation between you and the health workers in the treatment centers?
17. What do your family members think about your involvement in the DOT?
18. What do the TB patients think about your involvement in DOT?
19. How long will you continue doing DOT in future?
20. Do you have any problems for doing DOT?
21. If yes, what are they?
22. Are you happy with doing DOT?  
a. Yes                      b. No
23. If yes, why?
24. If no, why?
25. In your opinion, besides you (as FCHV) who else could be utilized to do DOT in your community?
26. What do you suggest to make DOTS program more accessible and convenient for both TB patients and the health service providers?

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Observation guideline for data collection from treatment centers/sub-centers/FCHVs

Name of the treatment center/sub-center/FCHV: -----

Observation done by: -----

Date of observation done: -----

**Subjects of observation**

**Observation note**

**a) Only for TB treatment centers:**

- Location of lab room
- Type/number/ condition of microscope
- Working condition of microscope
- Sputum collection technique
- Time taken for sputum report
- Use/update of lab register
- Availability of NTP lab manual
- Update of TB register

**b) For TC/TSC/FCHV**

- Update of TB card/pt card
- Availability of NTP manual
- Stock of TB drugs
- Technique of doing DOT
- Provision of water/glass for DOT
- Instruction given to the TB pt
- Average time to be waited by patients
- Behavior of HSPs to the TB patients