CHAPTER 2

PROJECT DESCRIPTION

2.1 Rationale

Tuberculosis (TB) is a communicable disease caused from Mycobacterium complex including the group of Mycobacteriums that causes diseases in humans and animals such as Mycobacterium tuberculosis, Mycobacterium bovis and Mycobacterium affricanum. Among these, Mycobacterium tuberculosis var. hominis (human type) causes most concerned public health problems at present. Apart from these three, there are other types of Mycobacterium in the nature that cause diseases similar to tuberculosis in human, but are very rare. This is a group of Non-tuberculosis mycobacteria (NTM) or unclassified mycobacteria or atypical mycobacteria, which often called Mycobacterium rather than the tuberculosis (MOTT). The main types of this group are M. avium complex (MAC) and M. intracellulare as there was a report of infections of these types in HIV/AIDS patients overseas. Other type that causes disease in human is M. leprae which causes Leprosy.

Over 80 percent of TB transmissions to people are the transmissions from patients who have pulmonary tuberculosis especially active cases with positive sputum smears. They will disseminate the pathogens by coughing, sneezing, speaking or spitting out the sputum which contains infected droplet nuclei of the sizes less than 10 microns floating in the air. Some of the nuclei are destroyed by sunlight but some are inhaled through the bronchus of normal persons into the distal bronchus (primary focus) and probably spread to the lymph nodes at the apex of the lung and cause lymphadenopathy (primary complex). Infected droplet nuclei with larger sizes will fall to the ground. However, only 10 percent of TB infected persons may become the disease after a range of few weeks to 20-30 years after the transmission. For persons who have good health and immunity, they may not become disease at all for their lives time. On the opposite, infected persons whose immunity are deficient from any causes such as cancer, diabetes, malnutrition and HIV/AIDS will have greater chances of getting the disease , especially with the worsening epidemic of HIV/AIDS in all regions around the world. In 1995, World Health Organization (WHO) announced that tuberculosis had emerged as the world health problems again (Ministry of Public Health, 1998).

Tuberculosis, as emerging disease, has transmitted very rapidly and become the only single infectious disease considered as the most important problem of the world (Ministry of Public Health, 1998). A lot of people, over 95 percent of which from developing countries and Southeast Asia, were infected and died of the disease. Majority of TB patients is in working ages; therefore there are quite enormous economic impacts for each country. Approximately one-third of world population

(1700 millions) got TB transmitted and there were 20 millions of TB patients worldwide in 1995, including 8 millions of new cases. That means that there is a new TB patient in every second or nearly 1 percent of world population per year. World Health Organization have estimated that in the year 2000-2020 there will be nearly 1 billion of new TB patients all over the world. Of this, 200 millions will become symptomatic and 35 millions will die of the disease unless there are effective control measures. Currently, WHO has reported each year that nearly 2 millions of world population died of tuberculosis (Fact sheet, WHO, 2000).

At present, DOTS approach is accepted by the WHO as the most effective control measure in reducing tuberculosis problem rendering the cure rate of exceeding 95 percent. DOTS, developed from several methods, has been experimented in countries around the world with big differences in the economic status, such as USA, Chili, China and Africa and the outcomes were satisfactory. The DOTS comprises of 5 component as shown in Appendix 7 Careful monitoring must be taken in every step to prevent the occurrence of MDR-TB. The WHO considered other areas such as the case finding as less important than the cure rate. Vaccination of Bacillus Camille Guerin (BCG) was recently found that it only helps reducing the severity of tuberculosis in children and TB meningitis. It cannot prevent infection of the disease in adults (WHO, 1995).

The increasing MDR-TB is an important problem that impacts the cure rate of tuberculosis. These problems were originated mostly from human factors such as the factors of health care workers involved in treatment and care, or the lack of treatment

compliance of patients. Apart from its impacts on TB cure rate, MDR-TB also has direct and indirect impacts on other areas; for example, it creates more difficulties in treatment for new cases of MDR TB and consequently makes increases in treatment costs. From treatment cost evaluation, it was found that treatment cost for new smear positive pulmonary TB patients using treatment in Category 1 (referred in Appendix 10) was approximately 2,300 Baht/person /6 months of treatment period. For Re - treatment MDR-TB, each patient had to pay 65,870 Baht more and the duration of treatment would need to be prolonged to 24 months. These costs are many times as much of the costs to treat cases without drug resistance. (Akkasilp S., 1997).

From the past to present, tuberculosis prevention and control in Thailand have not yet achieved the goals set by WHO, as detailed in appendix 12, but the rate of infection has been low and continuously declining, almost that it caused no health problems at all until the last decade when tuberculosis emerged as new health problem consequently from HIV/ AIDS impacts. From the impact, the rate of TB infection among Thai population has become increasing each year and TB is the most common opportunistic infection found in HIV/AIDS patients. At present, there is an estimation of 100,000 new patients per year, of which 10% are concurrently HIV infected. In northern Thailand, about 40 percent of TB patients are HIV infected and 40% of them require hospitalization. In Bangkok, the number of this kind of patients has increased twice as much within the past 4 years.

There are currently 12 Regional Tuberculosis Centers located in every part of the Thailand. Provincial and District TB Coordinators have been appointed in all provinces and districts. TB clinics were established in all community hospitals under Ministry of Public Health. Roi-Et is one of 7 provinces in servicing areas under the supervision of the Center of Communicable Disease Region 7, Ubonratchathani Province. Up to present TB control outcome is quite far from achieving the goals standard . In late 1996, Roi-Et province integrated DOTS approach into tuberculosis control but the operation outcomes were still below expected goals the data as sown in appendix 6,and have even made the decreasing cure rate both in Region 7 and at the national level (Annual report, 2000). In implementing DOTS, there were problems and obstacles encountered preventing them to meet the five main criteria. Those problems were different according to respective areas except one problem that they had in common. It was the problem about the persons who directly supervise and observe the oral drug administration of patients. Patients' relatives shared the majority of persons who took this responsibility, followed by village health volunteers and healthcare officers respectively as shown in appendix 6. There were not so many concerned problems to meet other DOTS criteria, as there were supports from the government such as the supply of anti-TB drugs, physical examination and diagnostic pulmonary tuberculosis by laboratory testing, etc. According to these problems, the DOTS approach has been integrated into the system of primary health care with the expectation to achieve successful tuberculosis control. Such integration was adopted by training assigned village health volunteers about the process of face to face education and DOTS to use as a tool to supervise and observe the oral administration of anti-TB drugs for TB patients in their villages. In fact, the TB control and prevention is also

included as a part of the local communicable disease control in the primary health care system. Ministry of Public Health has developed village health volunteers regularly. And in accordance to the National Socio-economic Development Plan 8 which emphasizes human resource development, the village health messengers were upgraded to village health volunteers covering all areas and take leading rolls to improve health status at community level. Each village health volunteer was assigned to be responsible for 10-15 households. At present, there is a good covering rate of 1 village health volunteer per 8-10 households in Roi-Et province. Qualifications of a person to be village health volunteer are:

1. A person who is respected by people in the community.
2. Willing to contribute to the community on voluntary basis.
3. Have sufficient time to help the community.
4. Literate
5. Be a good model in health and community development.
6. Should not currently being a government official or employee, chief of sub-district, head of village, monk and/or sub-district health officer.

Process of "face to face" training is an educating method that yields satisfactory results and is an effective tool to change health behaviours in particular. It is suitable for educating people in each village and/or community on a occasional basis, especially for small group of people with low educational background as it is easy to conduct and easy for participants to understand. It would be an effective method to educate Thai people in rural areas about tuberculosis even with the fact that this method has never been used in tuberculosis control activities. In other countries, face to face education were applied and modified to use in some areas. Its outcomes were satisfactory, such as

the study of an outcome of the use of ORS in pediatric patients with diarrhea to reduce the use of over-the-counter antibiotics in Kenya and Indonesia (Ross-Degnan, D. et al 1996). Furthermore, the face to face education was found to be effective for both small and large group, but it was more effective for small groups (Santoso, B. et all 1996).

In the past, the qualifications of the village health volunteers selected in some parts of Thailand were unable to meet the criteria set by the Primary Health Care office. Some of them were quite aged and possessed low educational background of only primary education. Therefore training of face to face education for assigned village health volunteers to be supervisor and direct observers of the oral administration of anti TB drug for new smear positive pulmonary TB patients in their community would be an additional option to achieve successful TB treatment program.

2.2 Objectives

2.2.1 General objectives

- To increase knowledge and performance skills of village health volunteers in supervising and monitoring the new smear positive pulmonary tuberculosis patients in taking oral medication under Direct Observed Treatment Short-Course scheme (DOTS) using the "face to face education".

2.2.2 Specific Objectives

1. To compare knowledge of village health volunteer who main supervisor and sub – supervisor before and after training.
2. To evaluate performance of village health volunteers in supervising the administration of oral medication under DOTS scheme for new smear positive pulmonary tuberculosis patients.
3. To increase treatment outcome in accordance with the guidelines of World Health Organization (WHO).

2.3 Methods / Approaches

Village heath volunteer training project was conducted in one village at a time and covered every village that there were new smear pulmonary tuberculosis patients who were prospectively selected using inclusion and exclusion criteria. Patients had to be registered in TB register forms (Ror Bor.1 Kor 04) between July-October 2000 in 5 TB clinics located in Phon Thong, Nong Phok, Meyavadi, Selephum and Pho Chai districts. These five districts are under the same health care servicing zone with similar geographic features. Their boundaries are also connected to each other, which have made the transportation convenient for person who are assigned to directly supervise and observe the medication taking of patients using face to face education. The pre-test is conducted for village health volunteers before the training is commenced. In some villages, there may be more than one patient who are new smear positive; the author

will conduct the training for village health volunteers only once, as the content is the same.

The author will also collect data of post-test from the same group after they complete the monitoring of patient medication for the first 2 months of treatment or the intensive phase. This process is shown in Figure 2.1.

2.3.1 Methods

Methods of project implementation are comprised of the followings:

1. Hold a meeting for village health volunteers in each village where there are new smear positive pulmonary tuberculosis patients qualified the selection criteria, coordinating with public health officer at health centers and community hospital responsible for that village for fast and convenient in arranging for appointments.
2. Held a meeting of all village health volunteers in selected village at the average of 8-12 persons per village on appointed date (not later than 3 days after completion of patient selection) in order to inform village health volunteers that there have been TB patients in the village. Two village health volunteers of the group will be selected on voluntary basis, but if no one volunteers, a group has to select two people, one to be the supervisor for monitoring drug administration of patients and another person to be the sub-supervisor in case the first person is not available.

3. Before training, conduct a pre-test to assess knowledge of 2 selected village health volunteers.

Start face to face education training with the 2 selected village health volunteers about of general knowledge of tuberculosis as well as the details of directly observed treatment -short course (DOTS). Discuss with them informally and let them have opportunity to ask questions. Demonstrate and practice how to check in DOTS card. Show them the example of anti-TB drugs package using pictures in tuberculosis posters along with explanation. The contents of each training are as follows:

- **What is tuberculosis?**

Tuberculosis is a communicable disease caused by bacteria named "Mycobacterium Tuberculosis" which is in a group of Tuberculosis Complex. Tuberculosis infection is most commonly found at the lungs (pulmonary tuberculosis) and it creates a serious public health problem, as it is transmittable to other people.

- **Tuberculosis Epidemic**

World Health Organization (WHO) announced that approximately 3 millions of world populations are infected with tuberculosis each year. Majority of them lives in developing countries like Thailand. There are quite a large number of patients who have not been diagnosed and treated correctly and continuously resulting that tuberculosis becomes resistant to multiple anti-TB drugs and causes difficulties in treatment so that some TB patients become incurable. Tuberculosis therefore becomes a new emerging health problem at present.

- **Symptoms of tuberculosis patients or suspected patients**

The most observed symptom and signs of tuberculosis is the persistent cough for longer than 3 weeks. The nature of the cough is usually productive (with sputum) and sometimes there are also bloods coming out with sputum (heamoptysis). Apart from the cough, the persons usually have other concurrent symptoms as well, such as:

1. Body weight loss
2. Weakness
3. Fever, especially in the evening
4. Night sweating
5. Chest pain.
6. Difficulties in breathing : dyspnea
7. Anorexia

- **Tuberculosis Diagnosis**

The currently method of tuberculosis diagnosis is based on the results of sputum examinations using technique of direct smear of the 3 samples collected at different times with some intervals. The diagnosis is not based on chest x-ray films except for patients who have negative sputum smears.

- **Tuberculosis treatment**

Tuberculosis is an infectious disease, only some cases are curable with specific medicines. But all previously used treatments have not yet achieved the any success in minimizing TB problems because of several factors such as the drug

resistance of tuberculosis, the extensively long period of treatment, and patients' allergy to anti-TB drugs. At the present, DOTS is the latest method accepted by World Health Organization (WHO) as being most effective to reduce tuberculosis problems. It yields the cure rate of more than 85 percent. The five main criteria/components of DOTS are as follows:

1. Political commitment
2. Diagnosis by microscopy
3. Adequate supply of anti-TB drugs
4. Directly observed treatment
5. Accountability

From previous DOTS implementation, the most problems found are in the 4th criteria "directly observed treatment" whereas the other criteria are fully supported by the government. Therefore, village health volunteers, community leaders and relatives can be very helpful in implementing the 4th criteria if they are properly trained and advised.

- **Tuberculosis prevention**

It is very difficult to prevent the transmission of tuberculosis into human body, as it is an airborne disease and transmittable through the air we need to breathe every day. As long as there are active TB patients in the community, the transmission of the disease still exists. "Cure the patient" is the best preventive measure for tuberculosis, which is different from other communicable diseases where emphasizes are made on the prevention before getting infections. " Stop TB, stop at the source". Fortunately, the tuberculosis pathogens can be easily destroyed in unsuitable

environments such as direct exposure to the heat or sunlight. Therefore, there are several methods to reduce tuberculosis transmission, such as management for good ventilation and BCG vaccination in children.

- **How can village health volunteers help in tuberculosis control?**

In the tuberculosis treatment under DOTS method, the assignment of persons to supervise and directly observe the medication taking of patients is extremely important in order to ensure that patients receive anti-TB drugs throughout the treatment period. It is quite hard for patients to come and take anti-TB drug in front of health officer every day as there are some limiting factors like travelling distance, economics, excessive works of health officers and so on. Village health volunteers are recognized as health personnel who are able to help supervising and observing anti-TB drug administration of TB patients. The assigned roles of village health volunteers are as following:

- Supply a package of anti-TB drug (prepared by health officials) to each of TB to take one package each day. Ask them to take one package orally in front of the village health volunteers. The anti-TB drugs may be directly delivered to patients at home or they have to come to take the drugs at the house of village health volunteers depending on the situations throughout the treatment period.
- Check the DOTS card as detailed in Appendix 11.

Encourage patients when they encounter difficulties or problems from the treatment process and cooperate with other health officers for further assistance.

2.4 Criteria for a Selection of Patients to Choose Target Village into Village Health Volunteers Training Project.

1. **Inclusion criteria**

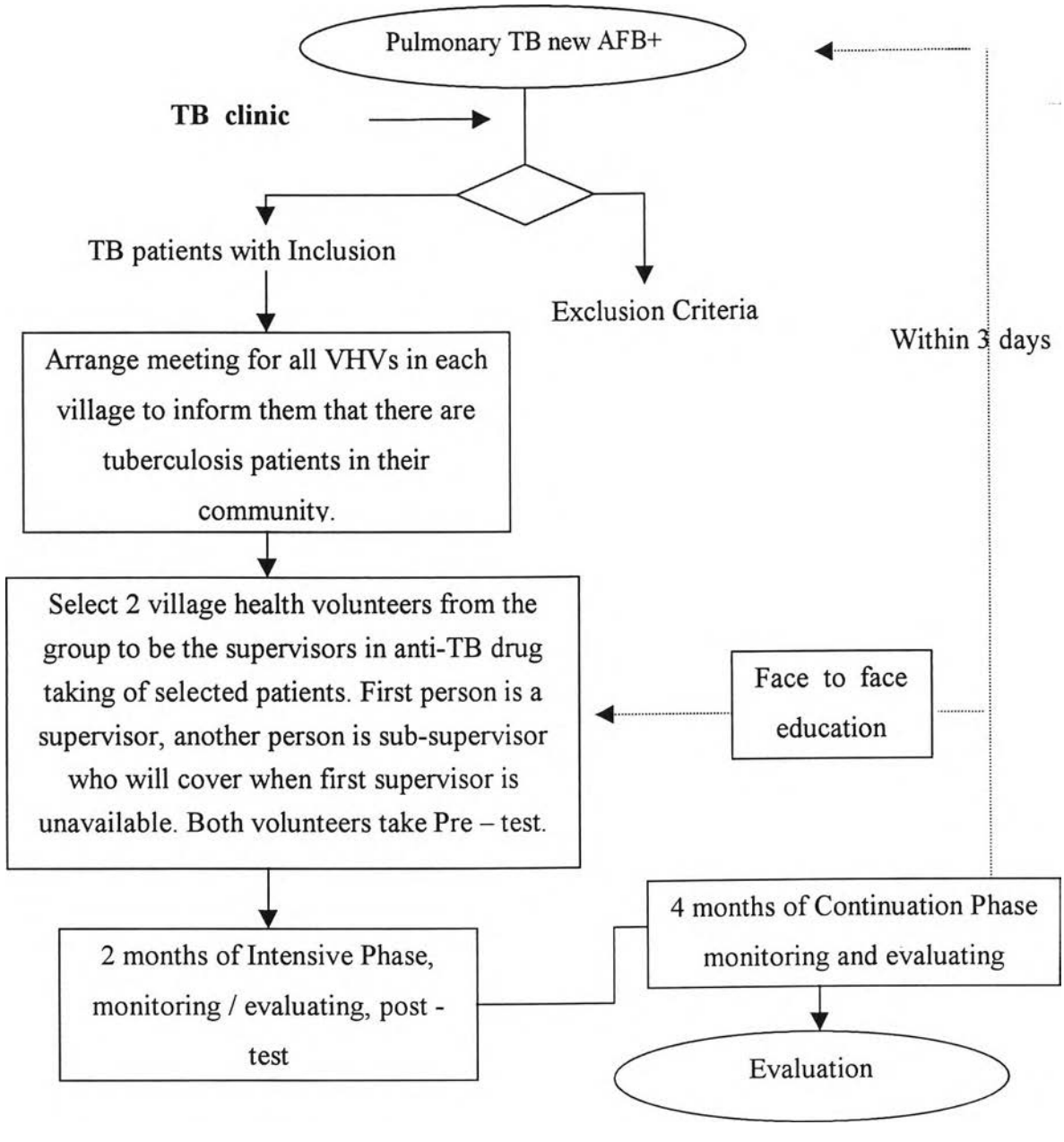
   - Patients have to be new smear positive pulmonary tuberculosis patients only.
   - Patients have been diagnosed from physicians either from private or governmental health care settings.
   - Male or female
   - 15 years of age or older
   - Patients have received anti-TB drugs Category 1 (Details showed in Appendix10).
   - Patients are willing to be supervised and directly observed by village health volunteers for their medication taking.
   - Patients are able to stay in the area throughout the period of treatment.

2. **Exclusion criteria**

   - Patients are in severe conditions/ seriously ill and unable to stay throughout the treatment plan.
   - Pregnancy
   - Severe allergy to anti-TB drugs especially Rifampicin, Isoniazid, Pyracinamide, Ethambutol and other treatment chemicals.
   - Presence of other concurrent chronic diseases.

- Patients who reside in area of Phon Thong, Slephum, Nong Phok, Pho Chai and Meyavadi municipality and/or other villages where there is no village health volunteer.

Figure 2.1 : Summary of project implementation of "face to face education for village health volunteers on directly observed treatment short-course (DOTS) in new smear positive pulmonary tuberculosis patients" project.



2.5 Activity Plan with Timetable

Table 2.1 : Proposed work plan

Activity	2000									
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Phase 1										
1. Project framework planning										
2. Propose framework of the study.										
3. Submit letter for permission to conduct the project to Roi-ET Public Health Office and the relevant authorities.										
4. Process project study										
4.1 Selection of patients to the study										
4.2 Conduct Pre-test with village health volunteer representatives.										
4.3 Conduct face to face training with 2 selected village health volunteers.										
4.4 Supervision										
4.5 Check list and post-test										
4.6 Data analysis										
4.7 Thesis writing										
Phase 2										
1. Supervision in continuation phase.										
2. Project outcome evaluation										
3. Submit project outcome to Roi-Et Public Health Office.										

2.6 Potential Problems, Conflicts and Possible Mean for Resolution

Problems found during project implementation can be classified into 3 main parts:

1. Problems in government sectors: The problem mostly concerned is the ignorance of public health workers to tuberculosis problems. They thought that it would be fine to start the prevention and control of the disease any time later as they love to, unlike other communicable diseases such as hemorrhagic fever and severe diarrhea which involve a lot of patients in each outbreak. As a result, tuberculosis is rated as a low profile. Solutions to this problem might involve educating public health workers and all relevant persons in every district to understand the situation and the impacts of tuberculosis.

2. Problems in regards to patients: Some TB patients do not accept that they are infected with the disease because they are afraid of being objected by society. They do not allow village health volunteers to be their supervisor on their anti-TB drug administration and only disclose themselves to health workers. Therefore, this study will provide additional explanation to the patients, make them understand and ensure that some of their information will be kept confidential. In case that patient does not agree, they will be excluded from the project study.

3. Problems in regards to village health volunteers: As the short-course treatment DOTS in Thailand require a long period of treatment that patients have to take anti-TB drugs in front of village health volunteers. It is very difficult to complete this task throughout the 180 days of treatment period without any remuneration. It would be better to adjust the length of supervising and observing anti-TB drug administration shorten to probably the first 2 months of intensive phase which some countries have already done so.

2.7 Budgets

Table 2.2 : Budget lists.

Type	No. of Unit	Unit	Unit Rate	Amount	Total	Remark
Personnel						
Consultant 1	8	Months				
Consultant 2	8	Months				
Assistant 1	7	Times	100	700	700	
Assistant 2	7	Times	100	700	700	
Field Work						
VHVs' Remuneration for group meeting						
Lunch / Snack	88	Person	-	9,000	9,000	44 villages
Materials						
Anti TB drugs	44	package	1,000	44,000	44,000	GO. supply
Pre test , Post test questionnaire	176	duplicate	20	3,520	3,500	
Transportation	-	Lump sum	500	22,500	22,500	Lump sum
Publication	-	Lump sum	-	5,000	5,000	Lump sum
Total				**85,400**	**85,400**	