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⑦結核についての計画

*KINGDOM OF CAMBODIA*  
**MINISTRY OF HEALTH**  
National Tuberculosis Leprosy Programme

**TUBERCULOSIS PLAN**  
**1997 - 2000**  
**DRAFT**  
( Tentative translation from French )

Dr. Kong Kim San, Director of National Tuberculosis Programme.  
Dr. P-Y Norval, World Health Organisation.

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## ABBREVIATIONS

|        |   |
|--------|---|
| BAR    | Acid Fast Bacilli ( AFB )   |
| BCG    | Calmette and Guerin Bacilli   |
| BK     | Koch Bacilli  |
| CENAT  | National Anti-Tuberculosis Center   |
| CICR   | International Red Cross Committee   |
| CRF    | French Red Cross  |
| MSF    | Medecins (doctor or physician) Sans (without) Frontiere (border)                                  |
| ONG    | Non Governmental Organisation   |
| PNT    | National Tuberculosis Programme   |
| RAI    | Annual Risque Infection   |
| TPM+   | Pulmonary Tuberculosis smear positive   |
| TPM-   | Pulmonary Tuberculosis smear negative   |
| TEP    | Tuberculosis Extra Pulmonary  |
| UICTMR | International Union Against(Contre) Tuberculosis and Respiratory Diseases (Maladies Respiratoire) |
| VIH    | Human Immunodeficiency Virus  |
| CMS    | Central Medical Store   |

## MEDICINES

|     |  |
|-----|--|
| E   | Ethambutol   |
| H   | Isoniaside   |
| R   | Rifampicine  |
| S   | Streptomycine  |
| Z   | Pyrazinamide   |
| RH  | Rimactazine, mixed medecine Rifampicine + Isoniaside |
| EH  | Mixed medecine Ethambutol + Isoniaside               |
| RHE | Mixed medecine Rifampicine + Ethambutol + Isoniaside |

## REGIMES:

Category 1: 2EHRZ/6EH

Regime of 8 months with the first 2 months four medicines every day: Ethambutol, Rifampicine, Isoniaside and Pyrazinamide followed by 6 months of 2 medicines every day: Ethambutol and Isoniaside.

**Category 2: 3SRHZE/5R<sub>3</sub> H<sub>3</sub> Z<sub>3</sub>**

Regime of 8 months with the first 3 months 5 medicines every day: Streptomycine, Rifampicine, isoniaside, Pyrazenamide and Ethambutol followed by 5 months with 3 medicines two times per week: Rifampicine, Isoniazide and Pyrazinamide.

**Category 3: 2RHZ/2RH**

Regime of 4 months with the first 2 months 3 medicines every day: Rifampicine, Isoniaside and Pyrazinamide followed by 2 months with 2 medicines every day: Rifampicine and Isoniaside.

## INTRODUCTION

Cambodia is located in South East Asia limited West by Thailand and by Laos to the North, by Vietnam in the East and in the South by the gulf of Thailand. The surface area of the country is 181 035 square kilometers and its population is estimated at more than 10,000,000 habitants of which 85% live in rural areas. The average population density is 48 people/Km<sup>2</sup> and reaches more than 130 people / Km<sup>2</sup> in the province around Phnom Penh city. The map of the country and its population are shown in annexe 1 and 2.

The Gross National product per person was US\$160 in 1990. Rice is the principal product of the country and occupies 84% of the cultivated land. Demographic and economic information is shown in annexe 3.

The country has 19 provinces ("Khet"), 3 municipalities Phnom Penh, Kampong Som and Kep, 172 districts ("Srok") and 1517 communes ("Khum"). The two biggest cities are Phnom Penh and Battambang with approximately 800,000 and 100,000 peoples. Approximately 100,000 to 200,000 people migrate every year to Phnom Penh for several months in the dry season.

Cambodia is among those countries in the world, which are the most touched by Tuberculosis epidemic(1). The perspectives of development of the national tuberculosis programme are held up by 3 constraints: the weakness of the official institution and the services related to 20 years of war and international isolation, the lack of human resources and economics as policy outcome of collapse in year 1970, and a permanent rural insecurity which isolates some areas of the country. The Ministry of Health in collaboration with World Health Organisation (WHO) reinforced and are developed the national tuberculosis control programme starting the end of 1993. In less than 3 years the new programme adopted in Cambodia was able to double the cure rate for the whole country.

Between 1982-1992, the cure rate was estimated at 40%. The weakness of the Cambodian programme and the absence of improvement in the epidemiological situation made it impossible to reach at 85% cure rate of the diagnosed cases. The structure of the programme with vertical components for supervision, supplying of drugs and collection of information were implemented from 1980 with support of the French Red Cross.

To concentrate its attention toward cure rate rather than detection the Cambodia tuberculosis programme has reinforced 5 points keys recommended by WHO (2): 1) the support of the government for the tuberculosis programme, 2) Passive diagnosis based on microscopic examination of sputum, 3) Direct supervision of treatment, 4) The adequate supply of antituberculosis drugs, 5) Registration, supervision and evaluation of the programme.



## 1. EPIDEMIOLOGICAL SITUATION OF TUBERCULOSIS IN CAMBODIA.

Tuberculosis is the main cause of mortality in young adult in Asia. This disease is severe in the absence of correct treatment, because of its evolution. The physical and emotional suffering frequently prove fatal. The disease is worse in low income over crowded areas.

Tuberculin surveys have shown an annual risk of infection (ARI) in 1955, in Phnom Penh to be 4.26% and 3.76% in the provinces decrease in 1995 to 0.91% in the city and 0.75% in the remaining of the country (3-13). The annual rate of declining of ARI was 10% before 1981 and then 5.7% after this date. Only the surveys in 1995 were done on fully representative samples. Annexe 2 and figure 1. The data when compared with the results of active detection of tuberculosis can be considered almost like a survey of the prevalence in the general population. Between 1981 and 1989, active research of tuberculosis among a population 86,000 from different communities ( number surveyed= 5,000 people ), showed a prevalence of 455 pulmonary tuberculosis ( smear positive ) for every 100,000 people. Therefore the whole country which has a population of 9 million in 1993 about 40,000 tuberculosis of all forms is to expected. The incidence rate is normally estimated to be half of the prevalence rate in the country, or assumed that the epidemiological situation is stable. However, in Cambodia, the incidence is estimated ( after tuberculin survey in 1995 ) to be one fourth of prevalence. A programme with an effective cure rate of more than 85% has to have a decrease faster than the number of prevalence cases. This effect, however, will some areas be hidden by increasing incidences related to the interaction of the AIDS epidemic and endemic tuberculosis.

The importance of tuberculosis in Cambodia seem to be related with the high prevalence of cases which are caused by bad organization and incomplete treatments. The transmission of tuberculosis has shown a rapid decrease since 1980, following the Pol Pot regime.

The surveillance of seroprevalence of AIDS cases among tuberculosis cases with smear positive showed a rate of 0% in 1992 in Phnom Penh, this increased rapidly to 11.3% in 1995. The surveillance was conducted in 5 provinces in 1995, and 19 of 21 provinces in 1996(annexe).

## 2. OBJECTIVES OF NATIONAL TUBERCULOSIS PROGRAMME ( NTP )

The aim, the objectives and the principles of NTP remain identical which is defined in 1993 in the plan 1993-1997.

The general purpose is to detect and to cure as much tuberculosis as possible to reduce of bacilli transmission and further the incidence of disease.

To reach this objectives, the strategies and the principles of NTP have to:

- 1). Cover all the country without neglect the rural sector which is the priority of the population.
- 2). Be permanent because it accept that the situation becoming better if the programme is applied with effectiveness in at least one generation.
- 3). Be intergrated into the existing health services which release care and manage the national health system.
- 4). Be standardized in any public formations and private of the country.
- 5). Be carried out by the personnel in place if he or she is recycled and regularly supervised according to the action plan of the provinces.
- 6). Be free of charge for all: bacteriological dignosis, treatment and food supplied at least during admission. The patients may pay only at the first contact according to the rule of the general care system as the same other pathologies.
- 7). Apply the Direct Treatment Supervision ( DTS ) in the whole country.
- 8). First to develop in Phnom Penh city then follow by the city with more than 20,000 population eg. DTS ambulatory by given drugs every day to the patients at their homes.

### 3- STRUCTURE OF NTP.

#### 3.1. At central level:

Under the control of the Director General of Health, Secretary of State for Health, director of NTP coordinates and manages the activities against Tuberculosis in the country. The team of the NTP comprises: the national Director, doctors, pharmacists, medical biologist, para-medical staff, laboratory technicians, one WHO consultant and other staff deemed usefully by the Ministry of Health. The team of NTP is based at CENAT and is linked with the team of the Leprosy Programme. The Reference laboratory responsible to the NTP and is located at CENAT.

The team of NTP has the following functions:

1. Define the objectives of the national programme and plan the operational stage of the programme.
2. Acquire and use all necessary means for the NTP; eg. materials needs (drugs, reagents of laboratory, formular, travelling), personnel and finances.
3. Manage and fund financing for research.
4. Compile the documents of the programme ( guide of technique, training module ).
5. Plan, train and retrain staff as required.
6. Supervise and evaluate the programme on a national level.
7. Analyse the data from epidemiological surveillance in order to evaluate the result of the fight against tuberculosis.
8. Promote research.
9. Promote information, education and communication.

CENAT is the main center of care and treatment of tuberculosis in the city of Phnom Penh.

*The committee of National Anti-Tuberculosis is composed as follow:*

- Honorary President H.E. Samdech Hun Sen, Second Prime Minister.
- President, Dr. Chhea Thang, Health for Minister.
- Secretary, Dr. Kong Kim San, Director of NTP.
- Members:

. One representant of Ministry of Education, of Information

. 21 Provincial Vice Governors

## 21 Provincial Health directors

The Committee has the aim to support, direct and evaluate the NTP in the realization of its task.

### 3.2. At the provincial level.

Basically the organization is the same as at the national level. Under the authority of the provincial health Director, the medical supervisor of tuberculosis is responsible for tuberculosis at provincial level. He is helped by a provincial laboratory supervisor. The Provincial team monitors of all treatment centers in the province ( included the treatment center in provincial hospital ). Their functions are as follows:

- 1) To ensure that the treatment center has regular supplies without interruption ( shortage) of stock in drugs, laboratory reagents, etc...
- 2) To train and retrain the laboratory and treatment personnel of the center to keep accurate, up to date the "laboratory register" and "hospital tuberculosis register"
- 3) To supervise the quality of the registration, Health Information System (SIS), bacteriological diagnosis, medicine taking, bacteriologic and clinical follow-up, and the follow-up of absent patients in operational district with a tuberculosis service, and some 56 health centers through out the country.
- 4) To confirm that smear positive patient are noted down in both "the tuberculosis laboratory" and " hospital tuberculosis register"
- 5) To confirm that smear negative patients results are recorded in "the hospital tuberculosis register" and had 3 sputum examination also recorded in "the laboratory register".
- 6) To collect and analyse epidemiological data ( number of new case and analyse of cohort ) from provincial treatment centers and send it to the central level through SIS.

### 3.3. At the level of operational district hospitals and health centers related to the fight of tuberculosis.

The health personnel responsible for tuberculosis is composed of one laboratory technician and the health care staff. They have the following function.

- 1) To ensure bacteriological and clinical diagnosis
- 2) To treat the patients
- 3) To supervise that drugs are taken every day during the intensive phase of treatment and drugs are taken less frequent during continuation phase

- 4) To give information-advice for HIV ( counselling)
- 5) To be in responsible and participate in the social medical of AIDS cases
- 6) To ensure the bacteriological and clinical follow-up of cases at months 5, 8 and 12
- 7) To take care every day of formular and tuberculosis register
- 8) To complete every quarter the data for new cases, analyse of cohort and stock of drugs and reagents
- 9) To actively follow-up of absents patients.

#### 3.4. At the health care level not related to tuberculosis

The staff of the health center has the task of:

- 1) Identification of suspect tuberculosis cases ( cough more than 21 days )
- 2) Refer those suspects to near by tuberculosis services for confirmation or:
  - 2.1. Collect sputum and send it to near by tuberculosis service for bacteriology diagnosis
  - 2.2. Follow-up the result
- 3) Recalling of diagnosed cases and transfer information to the responsible tuberculosis staff
- 4) Control of the follow-up phase of treatment for the patients
- 5) Recalling of absent patients in collaboration with the relevant tuberculosis staff for treatment and follow-up
- 6) Study people living with the patient in the same house

Note any cases of drugs do not distributed to the patient by the health center or distributed by staff not related to the tuberculosis service.

#### 4. THE CHOICE OF TECHNIQUE AND STRATEGY OF NTP

##### 4.1. The definition of NTP.

##### 4.1.1. The forms of tuberculosis:

Tuberculosis is classified according to the following 3 forms:

Pulmonary tuberculosis with smear positive ( TPM+ )

Pulmonary tuberculosis with smear negative ( TPM- )

Extra-pulmonary tuberculosis ( TEP )

Pulmonary tuberculosis with smear positive ( TPM+ ) is defined as, the patient who presented:

- Two sputum examination are Acid Fast Bacilli ( AFB ) positive
- Or one sputum examination out of three is AFB positive and where the x-ray is indicative of tuberculosis

Pulmonary tuberculosis with smear negative ( TPM- ) is defined as a patient who presented:

- Three successive sputum examinations all AFB negative
- and received treatment with antibiotics or not specific drugs within two weeks without amelioration in clinical symptoms.
- and was put on treatment by a doctor.

*Exception:* Pulmonary tuberculosis in children less than 14 years old are classified as TPM- ( and not TEP ) and it is not necessary to find bacilli in sputum. The diagnosis is done by x-ray image showing pathologic signs.

Extra-pulmonary tuberculosis ( TEP ) ( for example, lymph node, pleural, bone, genital-urinary, kidney, peritoneal, intestin, meningitis, pericardic, skin ...) is defined as a patient who presented:

- The clinical sign and/or bacteriological confirmation and/or x-ray indicative.
- and was put on treatment by a doctor

Any TEP has to have a minimum of one sputum examination to make sure of the absence of TPM+

##### 4.1.2. The types of tuberculosis

At the beginning of treatment, the patient is classified according to 5 types as follow:

New case

Failure

Relapse

Retreatment

Transfer in

- A new tuberculosis case is a patient who starts treatment at having:

- Never received anti-tuberculosis treatment before
- Or received a treatment of anti-tuberculosis for less than one month.

- A failure case is a patient who restarts treatment because:

- He or she presented as smear positive at the end of 5<sup>th</sup> month or any time during treatment between the end of 5<sup>th</sup> month and the end of his treatment.

- A relapse case is a patient who restarts treatment because:

- He or she presented as smear positive after he or she has completed a previous treatment for active tuberculosis ( confirm or not by microscopy ) which has been declared cured.

- A retreatment case is a patient who restarts treatment because:

- He or she presented as smear positive after an interruption of previous treatment for more than 2 months.

- At that time he or she had already received treatment for more than 1 month.

A patient who interrupted his treatment for a period of less than 2 months and come back to the care center , has to complete his original treatment.

*A patient* who interrupted his treatment for a period more than 2 months and who has already received more than 1 month of treatment and who come back to care center and who presented at that time a sputum examination negative, has to complete his original treatment.

A patient who interrupted his treatment for a period of more than 2 months having already received a treatment of less than 1 month is classified as a new case if he returned to the center.

- A transfered in is a patient:

- Who has started his treatment in another district
- And who arrived in a new district to complete his treatment.

#### 4.1.3. The result of tuberculosis treatment.

At the end of treatment, the patients are classified according to 6 result as follow:

Cured  
Completed treatment  
Death  
Failure  
Relapse  
Transfert out.

*A cured case is a patient:*

- Who has completed his treatment
- And who has a sputum examination negative at 5<sup>th</sup> month and the last month of his treatment.

*A completed treatment is a patient:*

- Who completed his treatment
- But does not have the result of microscopy at the end month of his treatment.

*A death case is a patient who died at any time between the detection and the end of treatment, with any cause of death, even if he has not yet started the treatment.*

*A failure case is a patient who during his treatment presents as:*

- Smear positive at the 5<sup>th</sup> month or at any time between the end of the 5<sup>th</sup> month and the end of his treatment.

*A defaulter case is a patient:*

- Who did not take his treatment for more than 2 months.

*A transferred out is a patient who leave for another district to continue his treatment.*

#### 4.2. Screening and Diagnosis.

The following screening methods offer the best perspective output in number of cases detected:

- The examination of patients who present spontaneously indicative with symptoms persitante cough with sputum for at least 3 weeks, blood stained sputum, chest pain.
- The examination of people living in close contact with tuberculosis ( smear positive ) patients in the same house.

The methods of diagnosis are as follows:

- Sputum examination is the only method for diagnosis of pulmonary tuberculosis. Three sputums are collected if possible within 2 days for direct microscopic examination. The national reference laboratory of tuberculosis performs the quality control of



result for all laboratories in the country by cross checking of positive slides and a selection of of negative slides examined kept by direct supervision.

- Symptomatic treatment, or if indicated a treatment with non specific antibiotics is considered as a means of diagnosis which allows the elimination of as infections other than tuberculosis. This treatment can be prescribed while waiting for the results of laboratory examination or when the three direct sputum examinations are negative , but before x-ray.

- X-ray examination does not allow for confirmation of tuberculosis diagnosis, because images of x-rays are not characteristic and the disease can present with multiples form. X-ray should never be used as a first investigation ( that is before the result of sputum examination ) nor be used to follow the evolution of tuberculosis already diagnosed.

- The Erythrocytes Rate Sedimentation (ERS) is not useful neither for diagnosis nor for the follow-up of tuberculosis. This examination is neither sensitive nor specific and is not to be used in the treatment of tuberculosis.

- The diagnosis of tuberculosis in children is difficult because the sputum of children less than 14 years olds is difficult to obtain, and the majority of time is negative. The diagnosis relied on the following thoughts: Tuberculosis in other family members, clinical history, result of tuberculin test if the children have not been vaccinated, x-ray examination.

- Tuberculosis can affect to organs other than the lung, especially the nervous system ( meningitis tuberculosis ), lymph nodes, bone, and the vertebral column. The diagnosis of these forms at extra-pulmonary tuberculosis depend on the symptomatology of the affected organs and require of complementary examinations.

#### 4.3. Treatment and follow-up.

Antituberculosis drugs are always prescribed in groups according to the regime applied in private and public of the health structures in the country. The standard regimes consist of 2 phases: one intensive phase of 2 or 3 months with a minimum of three antituberculosis drugs and one continuation phase of 6 to 10 months with two general drugs.

The drugs used and their representative letter are as follows:

E = Ethambutol,

H = Isoniazide

R = Rifampicine

S = Srteptomycine

Z = Pyrazinamide

Some antituberculosis drugs are used in fixed combinations, they have an specific effect such as: RH = Rifampicine + Isoniaside, EH = Ethambutol + Isoniaside. A number precedes the first letter of each phase and indicates the duration in month of the phase. A small number in indice sometimes follows a letter and represents the number of weekly dosage.

There are 4 regimes of treatment and one of preventive chemotherapy in Cambodia.

Category 1: 2ERHZ / 6EH

Category 2: 3SRHZE / 5R<sub>3</sub>H<sub>3</sub>Z<sub>3</sub>

Category 3: 2RHZ / 2RH

Regime of prevntive : 6H

#### 4.3.1. The regime of treatment

Category 1: 2ERHZ / 6EH

This regime is indicated for new cases of TPM+ and for the severe forms of tuberculosis such as the meningitis and miliary lesions tuberculosis.

This regime is applied in districts following implementation of the new programme (cf. training and action plan) and which is judged to be reliable.

The criteria at 2 months are the availability of antituberculosis, the sensitivity-specificity of sputum examination, the proportion of TPM- to pulmonary tuberculosis put on treatment, the registration of the individual card, and register, the conversion 2 months to smear negative and the follow-up at the end of intensive phase.

Category 2: 3SRHZE / 5R<sub>3</sub>H<sub>3</sub>Z<sub>3</sub>

This regime is kept for the relapsed, cases retreatment or faillure ( cf. definition ).

Category 3: 2RHZ / 2RH

This regime applied only in the district hospital which follow implementation of new programme. It is intended for TPM- and TEP ( except the severe forms ). Children benefit from this regime.

Regime of preventive chemotherapy: 6H.

If a child less than 5 years old and in good health is living in the same house as a TPM+ patient, preventive chemotherapy with isoniaside is used. If a child is becomming sick, investigations should be done to confirm a possible case of tuberculosis.

#### 4.3.2. Drugs taken.

With any regime, the drugs are swallowed in presence of the health personnel, every day for all duration of the intensive phase. Admission to hospital is recommended for the patients who are not able to come every day, or three times weekly for the regime of category 2. The patients receive a supply drugs for a period of 1 month.

The distribution of drugs is to accompanied by advice and encouragement and the patient has reminded of the date of their next appointment sputum examination ie. It is the responsibility of the health care personnel to ensure the patient has complete information.

#### 4.3.3. Food supply (complementary food)

A daily ration of food is offered if possible to all tuberculosis patient for the duration of the intensive phase of treatment. The distribution is performed daily and is done after the drugs distribution. In the case of food from donor organizations being stopped the food for the patients will fall back as the government or the patients themselves.

#### 4.3.4. Bacteriologic follow-up

The periodic examination of sputum allows the results of treatment to be judged. A control examination will be carried out for the TPM+ at the end of the 2<sup>nd</sup> month ( end of 3<sup>rd</sup> for the regime of category 2 ), of 5<sup>th</sup> and the beginning of 8<sup>th</sup> month. The TPM+ with standard regime has one more control at the beginning of the 12<sup>th</sup> month.

#### 4.3.5. Clinical follow-up

A clinical examination has to be carried out on the occasion of all bacteriological controls. It allows to creation of good relations with the patient, encourages the patient, and allows the patient to explain about the side effects of the drugs, and allows staff to remind them of the next date for appointment.

#### 4.3.6. Recall of absences.

If the patient does not arrive at the appointment as schedule. He or she should be controlled as soon as possible. This requires that staff knows who is expected at a consultation ( use an agenda ), and know the precise address of the patient, also to know how to use the available means to contact and convince the patient that he should not interrupt his treatment.

#### 4.3.7. Tuberculosis in children less than 15 years olds.

The treatment of tuberculosis in children is defined in the technique module written by the NTP in collaboration with the national pediatric hospital.

#### 4.3.8. Health information system.

The information system can be defined as the continuous collection of information on activities of the programme and the analysis of these activities. The information system has two objectives : 1) To manage the needs for materials such as drugs, and personnels necessary for the fight against tuberculosis, 2) To evaluate the activities and the results of the programme.

The collection of information is considered a medical task which has consequence on the allowance of the means in materials and in personnel and at long term on the choice of health policy.

The information is compiled from the specific information areas as follows:

1) The card of antituberculosis treatment ( annexe 6 ) is an individual card placed at the hospital level which allows staff identify the patient, write down his disease, information follow-up of medicine taken, control of clinical and bacteriological data during his treatment. In the case of transfer, a new card is started by the hospital reception with a new registration number for the patient.

2) The patient card ( annexe 7 ) is a document given to the patient, which indicates the date of the next appointment and contains information on the disease status in case of medical emergency or in case of transfer to another center.

3) The hospital tuberculosis register ( annexe 8 ) is placed in the district hospital and contain all the information on all the patients in the district. It allows the completion of the quartely report of activities and the majority of cohort analysis. The details should be checked every day with tuberculosis laboratory register. A duplicated copy of the register ( carbon paper ) is sent every quarter to the central level for analysis of the data.

4) Tuberculosis laboratory register ( annexe 9 ) is a specific register of sputum examination placed in the tuberculosis laboratory. It allows the follow activities and results of laboratory and helps with the completion the quartely report of activities. It is compared one time per month with the tuberculosis hospital register to ensure that all diagnosed patients are all made on treatment and to look for the diagnosed patients not on treatment.

5) The quarterly report of activities data ( annexe 10 ) is taken from the tuberculosis hospital and laboratory register and gives information on quarterly activities and remaining drugs levels. This report is intergrated into the national health information system and follows its method of functioning and analysis.

6) The cohort analysis ( annexe 11 ) is completed every quarter from the tuberculosis hospital register. It follows what happened to patients that were on treatment 15 and 18 months ago. Cohort analysis is also made from national Health Information System report.

7) An inventory of material and personnel is done yearly.

#### 4.5. Vaccination by BCG:

Vaccination by BCG is done by Expanded Programme Immunisation (EPI). It is administered as soon as possible to all new born babies with mothers who are seropositive or HIV, in the Deltoid muscle of the left arm. BCG is not administered to the babies who present HIV infection symptoms.

#### 4.6. HIV infection / Tuberculosis:

The development of an HIV epidemic leads to a significant increase in the number of tuberculosis cases by:

- 1) Increasing the passage of "tuberculosis infection" ( more than 60% of adult population ) to "tuberculosis disease".
- 2) Accelerating the passage of disease stages for recent infections.
- 3) Increasing the source of infection in the population.

Tuberculosis appears in HIV infected subjects more frequently as extra-pulmonary, but sometimes it is complicated and causes a problem with diagnosis.

The principles of treatment are the same. Also no particular serological detection measure for HIV are not available for tuberculosis patients.

✓ ⑧国家結核対策

*KINGDOM OF CAMBODIA*

*MINISTRY OF HEALTH*

*Direction of Communicable Diseases*

*National Tuberculosis Programme*

# *NATIONAL TUBERCULOSIS PROGRAMME*

*(NTP)*

*Workplan 1993-1997*

*Dr Kong Kim San, Director of The National Tuberculosis Programme  
Dr P-Y Norval, World Health Organization .*

*November 1993*

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## 1. Epidemiology

40,000 new cases are estimated to appear each year in Cambodia. Tuberculosis (TB) is responsible for 13,000 deaths every year and is the main cause of death in young adults.

## 2. Present situation.

From 40,000 new cases each year only 11,000 are treated. The case finding rate in the whole country was estimated to be 30% in 1993. (11,000 from 40,000).

From 11,000 TB cases starting treatment only 4,400 will finish. The cure rate in the whole country was estimated at 40% in 1993.

The impact of the activity was estimated to be 8% considering the efficacy of the protocol to be 70%. In the last 10 years a network of bacteriological diagnosis and treatment has been implemented throughout the country in nearly 100 Districts.

The frequent shortage of drugs, the non-supervision of daily intake of drugs during the initial phase of treatment, and the inadequate efficiency of the 12 month protocol all help to explain the moderate success of the National Programme.

## 3. Objectives of the new National Tuberculosis Programme (NTP).

Cure rate : 85% of TB cases under Short Course Chemotherapy.

Smear positive case finding rate : 70% in 1997.

To reach these objectives, the NTP must be :

- National
- Uniform
- Integrated
- Permanent
- Free of charge for bacteriological and medical diagnosis, treatment, hospitalization...
- Applied by existing staff, following updated training.

## 4. Structure of NTP.

### 4.1. Central level.

The NTP is responsible to the Direction of Communicable Diseases of the Ministry of Health. The Director of the NTP coordinates and manages the anti-tuberculosis activities for the whole country.

The NTP at national level has a team including the NTP director, 5 doctors, 1 pharmacist, 1 biologist physician, para-medical staff, laboratory technicians and is supported by a WHO consultant.

The NTP is located at CENAT (Centre National AntiTuberculeux) which is also the tuberculosis hospital for the capital. The NTP might move to the National Institute of Public Health in the future. The Tuberculosis Reference Laboratory is also at the CENAT.

The functions of the NTP are :

1. Define objectives of the programme and prepare workplans for the implementation of the programme throughout the country.



2. Supply and equip the national level, and the district and provincial hospitals throughout the country for TB case management (TB drugs, laboratory reagents and supplies, laboratory equipment for TB diagnosis and transportation) in collaboration with the Ministry of Health.
3. Raise funds and coordinate the needs of the donors.
4. Prepare TB documentation (technical guidelines, training modules etc.)
5. Train the medical staff and the laboratory technicians by holding workshops and introducing their documents into medical and nursing schools.
6. Organize supervision at each level (Central, Provincial, and District).
7. Analyze TB data collected through a National Health Information System and promote epidemiological surveillance of HIV-TB infection and drug resistance.
8. Evaluate the results of the programme and NTP activities.
9. Promote research, Information Education and Communication (IEC).

A national TB Technical Committee will be held once a year to support the NTP activities, and to orientate the and to make assessment of the NTP.

#### 4.2. Provincial level ( Intermediate level ).

At Provincial level, TB activities are under the responsibility of the Provincial Health Director. He usually delegates the TB activities to a TB coordinator.

The Provincial TB coordinator is in charge of the NTP for the Province, he sometimes coordinates other programmes (Leprosy, Malaria, Dengue, HIV, EPI..... ) or works closely with these programmes. He is located either at the Direction of Health or the Hygiene Centre or even the Provincial Hospital.

His functions are :

1. Ensure the District and Provincial hospitals are regularly supplied with enough drugs, reagents and products.
2. Train laboratory and medical staff in the use of "Hospital TB Laboratory Register", and "TB Hospital Register".
3. Supervise quality of registration, quarterly reports, diagnosis by direct microscopy examination, clinical and laboratory follow up, intakes of drug, and patient tracing.
4. Verify TB cases registered in the "Hospital TB Laboratory Register" are also registered in the "TB Hospital Register".
5. Verify smear negative TB cases registered in the "TB Hospital Register" have had 3 negative smears registered in the "Hospital TB Laboratory Register".
6. Collect and analyze TB data from all the hospitals of the Province (new cases and cohort analysis).

#### 4.3. Peripheral level.

Health staff in charge of Tuberculosis are one or several of the following : doctor, nurse laboratory technician.

Their functions are :

1. Provide passive case finding during consultations.
2. Provide case diagnosis by direct smear examination of sputum.
3. Starting treatment.
4. Supervise daily drug intakes during the initial phase of treatment and ambulatory treatment during the continuation phase.
5. Fill in individual forms and TB registers.
6. Complete quarterly reports on new TB cases and the cohort analysis, as well as the status of drugs and reagents.
7. Identify and trace defaulter cases.

#### 4.4. Commune dispensary.

Health staff in charge of a dispensary should :

1. Identify patients coughing for more than 21 days.
2. Refer these patients to the district hospital for a smear examination of their sputum or refer 3 sputums in sealed containers to the district hospital for examination.

### 5. Activity.

#### 5.1. Case finding methods.

The following methods offer the best prospects for significant yields of cases :

1. The examination of patients with relevant symptoms (bloodstained sputum, chest pain, weight loss, fever or night sweats) who present themselves on their own initiative at health facilities (passive case finding)
2. The examination of household contacts (especially children and young adults) of all smear-positive Tuberculosis patients diagnosed.

#### 5.2. Diagnostic Methods.

Bacteriological examination of sputum is, as a rule, the only way in which the diagnosis of pulmonary Tuberculosis can be confirmed in Cambodia.

Whenever TB is suspected, at least 3 specimens of sputum should be collected and examined by microscopy. If possible, they should be obtained within 2 days.

A course of symptomatic treatment or (if indicated) antibiotics suitable for non-tuberculosis infection (but NOT Streptomycin or Rifampicin) may be given if 3 sputums are smear negative. Should the patient fail to respond to this treatment and remain ill, even though the smears were negative, the patient should be referred for further investigation (clinical and radiological).

X-ray diagnosis of TB is unreliable, because other chest diseases can look like TB on X-ray, and pulmonary tuberculosis may show many forms of radiographic abnormality. It must be stressed that the determination of clinical activity of tuberculosis by X-ray is totally unreliable. Moreover, the cost of X-ray examination is relatively high in relation to case-finding results. Consequently, X-rays should not be used in initial examination, or as a follow-up examination. They should only be used after 3 smear negative samples, and when patients fail to improve with routine antibiotic treatment. In spite of this, X-ray examination can undoubtedly be very helpful in clinical work when investigating TB among patients with symptoms suggestive of tuberculosis, children or young adult contacts of infectious cases, and in patients suffering from miliary or extra-pulmonary tuberculosis.

Erythrocyte Sedimentation Rate (ESR) is not useful for the diagnosis or follow-up of TB, and should not be performed within the NTP.

Tuberculosis amongst children (< 15 years) is difficult to diagnose because samples of sputum are hard to obtain and are often smear negative. Diagnosis should be made on the basis of clinical symptoms, smear positive contacts, interpretation of tuberculin (mantoux) tests if the children have not been vaccinated and X-ray examination.

Depending on the organ involved diagnosis of extra-pulmonary tuberculosis can usually only be made by a Medical Officer.

### 5.3. Treatment.

AntiTB drugs are always prescribed in combination. The protocol standardizes these combinations throughout the country (private, public and public health centres). The regimen includes 2 phases, the initial phase being 2-3 months with a minimum of 3 antiTB drugs, and the continuation phase of 6-10 months which is usually 2 drugs.

The conventional presentation is as follows :

E - Ethambutol, H - Isoniazide, R - Rifampicin, S - Streptomycin, Z - Pyrazinamide.

EH - Ethambutol and Isoniazide, RH - Rifampicin and Isoniazide.

TPM+ Smear positive, TPM- Smear negative, TEP Extra - pulmonary TB.

The number before the first letter of each phase indicates the number of months of the phase. The small sub-number after the letters are the number of weekly doses.

NTP includes 4 treatment regimens and 1 chemotherapy regimen.

|                      |  |
|----------------------|--|
| <i>Category 1</i>    | 2ERHZ/6EH. for new smear positive patients and severe illness.   |
| <i>Category 2</i>    | 3SRHZE/5R,H,Z <sub>2</sub> . for relapse, failure or treatment after default (smear + patients)              |
| <i>Category 3</i>    | 2RHZ/2RH. for smear negative and extrapulmonary TB, except severe cases. Children will receive this regimen. |
| <i>Standard Reg.</i> | 2EHZ/10EH. for new cases of TB before the implementation of the new programme ( TPM+ TPM- TEP ).             |
| <i>Chemotherapy</i>  | 6H. for children < 5 years in good health in the same household as a smear positive patient.                 |

(32) Whatever the regimen, drugs should be swallowed in front of health center staff daily during the whole initial phase period. Hospitalization is recommended for severe cases and for patients who cannot attend daily. During the continuation phase, drugs are taken daily or three times a week and the patient should collect enough drugs for one months medication.

### 5.4. Follow-up.

Bacteriological control will be performed for smear positive cases at the end of months 2, ( 3 ), 5, and the beginning of month 8. ( also start month 12 -std regimen.). Clinical control can be performed at the same time as bacteriological examination.

When a patient does not collect their drugs at the correct time action should be taken straight away to trace them. Precise addresses should be registered and local people contacted to help tracing.

### 5.5. Health Information.

The accurate keeping of records on all individual patients, and periodic reporting with statistics on patients and activities, together with explanatory remarks, is essential for planning of procurement of drugs, laboratory reagents, sputum containers, of hospital beds for TB, of manpower, as well as for evaluation of control measures applied in the TB programme.

The number of documents used in the programme is limited as much as possible. The following

recording and reporting materials are used :

- Tuberculosis Hospital Register : kept at district and provincial hospital level.
- Tuberculosis Treatment Card for each patient under treatment : kept in all district and provincial hospitals giving chemotherapy.
- Patient's Identity Card : kept by the patient.
- Tuberculosis Laboratory Register : kept at laboratories carrying out sputum examination for tubercle bacilli.
- Request form for Sputum Examination : kept at all district and provincial hospitals.
- Quarterly Report on Case-Finding : kept at district and provincial hospitals by a health worker responsible for the NTP and within the National Health Information System.
- Quarterly Report on Results of Chemotherapy : kept at district and provincial hospital level by a health worker responsible for the NTP and within the National Health Information System.

#### 5.6. BCG Vaccination.

BCG vaccination is included in the Expanded Programme on Immunization (EPI) in Cambodia. It is given as early as possible in life, preferably at birth, even to those born to HIV positive mothers or those suffering from the disease. BCG should not be prescribed for patients with symptomatic A.I.D.S. infection.

#### 5.7. HIV and Tuberculosis.

The development of the HIV epidemic brings a significant increase in the number of TB cases for 3 main reasons :

- 1- Increase transformation from TB infected to TB disease cases.
- 2- Acceleration of transformation of recently infected cases.
- 3- Increase in infection sources in the population.

TB infections among the HIV population are more often extrapulmonary cases and sometimes hard to diagnose.

Treatment is the same as for HIV negative patients. No particular HIV investigations should be performed among TB cases.

## 6. Action Plan.

The activity has been described in the previous sections.  
This work plan gives the sequence of activity for the period 1994 to 1997.

| SUBJECT             | ACTIVITY   | DATE DEADLINE | ESTIMATED COST |
|---------------------|--|---------------|----------------|
| Programme documents | Write, adopt, edit and translate the following:<br>1 Workplan for 1993 to 1994<br>2 Medical guidelines<br>3 Laboratory guidelines<br>4 Medical training module<br>5 Laboratory training module.  | DEC 1993      | Nil            |
| Funding             | Raise funds for NTP from, the Government budget, International Organisations, and Private donors for the period 1994 to 1997.  | Permanent.    | Nil            |
| Human Resources     | To promote the participation of personnel from external organisations such as VSO, Croix Rouge Francaise, OSB etc.<br>Have an organizer of work and personnel at CENAT and help with the following :<br>3 teams for training and supervision<br>1 team for Laboratory Q.C and Culture<br>1 team for logistics and drug supply<br>1 team for data collection and survey<br>1 team for tuberculin survey | Permanent     | Nil            |

| SUBJECT                               | ACTIVITY   | DATE DEADLINE  | ESTIMATED COST<br>'94 '95-97   |
|---------------------------------------|--|--|--|
| Work plan for drug and reagent supply | <ol style="list-style-type: none"> <li>To follow-up medicines given by donating organizations - KFW, ODA, World Bank etc.</li> <li>To estimate the need each year for 1 years supply and 1 years stock of reagents and medicines as well as prepare an order of expected use and to follow-up this order.</li> <li>To ensure that medicines and reagents get to the Central Medical Store (CMS) and to collaborate with them on stock levels and distribution every 3 months. Remaining stock and regular distribution should also be monitored.</li> <li>To check stock at CENAT and it's condition.</li> </ol> | <p>June 1994</p> <p>November each year</p> <p>Every 3 months</p> <p>Every 6 months</p>                     | \$1.7 m \$2.2 m  |
| Equipment (and non consumables)       | <p>To equip:</p> <ol style="list-style-type: none"> <li>Three teams for training and supervision with 2 vehicles (4x4), fuel and stationary.</li> <li>One team for tuberculin survey with 1 vehicle (4x4), and fuel.</li> <li>The office of the NTP with data processing, photocopies, overhead projector, air conditioner tables and chairs etc.</li> <li>The reference laboratory with a safety cabinet, autoclave incubator, fluorescence microscope and centrifuge.</li> <li>All the laboratories in the country with a microscope and routine lab. materials.</li> </ol>                                    | <p>December 1994</p> <p>December 1994</p> <p>June 1994</p> <p>December 1994</p> <p>Permanent</p>           | <p>\$84.000</p> <p>\$32.000</p> <p>\$20.000</p> <p>\$19.000</p> <p>\$70.000 \$120.000</p>  |
| Training                              | <ol style="list-style-type: none"> <li>One in-house workshop for medical and laboratory trainers.</li> <li>Twentyone 1 week provincial workshops for medical and laboratory staff.</li> <li>Medical and laboratory staff short course training overseas.</li> </ol>  | <p>January 1994</p> <p>Permanent</p> <p>Yearly</p>   | <p>Nil</p> <p>\$40.000</p> <p>\$84.000</p>   |
| Rehabilitation                        | <p>Rehabilitate the following:</p> <ol style="list-style-type: none"> <li>The NTP office</li> <li>The Reference Laboratory</li> <li>The "hospital rooms" of the district hospitals.</li> <li>The district hospital labs, according to their needs.</li> </ol>  | <p>January 1995</p> <p>January 1994</p> <p>Permanent</p> <p>Permanent</p>                                  | <p>\$60.000</p> <p>\$190.000</p>   |
| Training, Education & Communication   | <ol style="list-style-type: none"> <li>To realize a reporting picture.</li> <li>To realize a reporting video.</li> <li>To create a National League Against TB</li> </ol>   | <p>March 1994</p> <p>June 1994</p> <p>December 1995</p>  | <p>\$13.000</p>  |
| Surveillance and Epidemiology         | <ol style="list-style-type: none"> <li>To watch over the association between HIV and TB</li> <li>To write a protocol for the tuberculin survey.</li> </ol>   | <p>January each year</p> <p>March 1994</p>   |  |
| Research                              | <ol style="list-style-type: none"> <li>Realize the tuberculin survey.</li> <li>Promote operational research to improve the attitude/practice of health workers.</li> <li>Hold a workshop for provincial coordinators.</li> <li>Evaluate the NTP each year and present the results to the national technical commission.</li> <li>Make a review of the programme by using external personnel.</li> </ol>  | <p>June 1994</p> <p>Permanent</p> <p>January each year</p> <p>January each year</p> <p>Every two years</p> | <p>\$30.000</p> <p>\$3.000 \$7000</p> <p>\$3.000 \$9.000</p> <p>\$40.000 (for 2 years)</p> |

## 7. Implementation of the new programme

### 7.1. Put on line in 1994

| Province         | Training       | Implementation | Supervision                                    |
|------------------|----------------|----------------|--|
| PURSAT           | February 1994  | March 1994     | March 1994<br>April 1994<br>August 1994        |
| BATTAMBANG       | March 1994     | March 1994     | April 1994<br>May 1994<br>August 1994          |
| SIEMREAP         | April 1994     | April 1994     | May 1994<br>June 1994<br>September 1994        |
| TAKEO            | May 1994       | June 1994      | July 1994<br>August 1994<br>November 1994      |
| PHNOM PENH       | June 1994      | June 1994      | July 1994<br>August 1994<br>November 1994      |
| KANDAL           | July 1994      | July 1994      | August 1994<br>September 1994<br>December 1994 |
| KOMPONG CHAM     | August 1994    | August 1994    |  |
| BANTEAY MEANCHEY | September 1994 | September 1994 |  |
| KOMPONG SPEU     | October 1994   | October 1994   |  |
| SVAY RIENG       | November 1994  | November 1994  |  |

### 7.2. Put on line for 1995

- Kampong Chhnang
- Prey Veng
- Kampong Thom
- Kratié
- Stung Treng
- Ratanakiri
- Mondulkiri
- Koh Kong
- Kampot

8. Drugs needs.

8.1 Expected number of cases

1994- 11,800    1995- 13.000    1996- 14.400    1997- 16.000

Estimated medicine requirement for 1994 to 1997

|                 | Unites    | 1994        | 1995      | 1996      | 1997      |
|-----------------|-----------|-------------|-----------|-----------|-----------|
| Sireptomycin    | Fl 1g     | 240.000     | 130.000   | 160.000   | 200.000   |
| Water injection | amp. 5ml  | 240.000     | 130.000   | 160.000   | 200.000   |
| Ethambutol-LNH  | C.450/150 | 1.600.000   | 1.500.000 | 2.600.000 | 4.000.000 |
| Pyrazinamide    | C.500mg   | 5.200.000   | 2.900.000 | 3.200.000 | 4.000.000 |
| Ethambutol      | C.400mg   | 14.4000.000 | 6.000.000 | 4.200.000 | 4.000.000 |
| Rifampicine-LNH | C.150/100 | 1.800.000   | 1.700.000 | 2.900.000 | 4.000.000 |
| Rifampicine     | C.150     | 800.000     | 300.000   | 200.000   | 50.000    |
| DNH             | C.100     | 12.400.000  | 4.700.000 | 2.500.000 | 1.000.000 |

Number of the new case to treat according to the formula

| Formula                 | 1994      | 1995      | 1996      | 1997      |
|-------------------------|-----------|-----------|-----------|-----------|
| 2 EHZ/10 EH             | 7.057     | 5.881     | 3.134     |           |
| 2 E (RH) Z/6 HE         | 2.645     | 4.410     | 7.277     | 10.675    |
| 1 (RH) Z/C (RH)         | 882       | 1.470     | 2.426     | 2.668     |
| 3 S (RH) ZE/S (RH) 3 Z3 | 1.473     | 1.732     | 1.138     | 2.775     |
| Total of the NC         | 11.773    | 13.068    | 14.374    | 15.989    |
| Cost of the medicine S  | 1.100.000 | 617.000   | 693.000   | 755.000   |
| Cost of NP              | 1.600.000 | 1.000.000 | 1.000.000 | 1.000.000 |



INQUIRY SHEET  
FOR PROJECT TECHNICAL COOPERATION (PTTC) PROGRAM

1. Title of proposed Project

National Tuberculosis Control Project

2. Implementing Agency

2-1. Name of Implementing Agency and Responsible Ministry

a. Implementing Agency : CENAT(Centre National Anti-Tuberculoses)

b. Responsible Ministry : Ministry of Health (MOH)

Department of Communicable Diseases

2-2. Project site

Street 278/95, Phnom Penh City

2-3. Related Government Agency in the Project Implementation

Department of Hospital and Medical Services, MOH

Department of Drugs, Chemicals, and Supplies, MOH

2-4. Outline of Implementing Agency

(1) Mandate

CENAT is the referral center for Tuberculosis in Cambodia.

a. Policy making for National Tuberculosis Control Program (NTP).

b. Training of all personnel who are implementing NTP.

c. Evaluation and monitoring of NTP.

(2) Organization Chart

see attached paper (attachment 1-3)

(3) Land and Facilities

see attached paper (attachment 4)

(4) Existing Equipment

Two old and small buildings are used for all activities in CENAT

The list of equipment is attached. (attachment 5)

(5) Annual Budget Allocation and Number of Staff

Expenditure in 1996 from Government

|             |             |
|-------------|-------------|
| Total       | US\$ 42,336 |
| Salary      | US\$ 26,818 |
| Supervision | US\$ 3,712  |
| Gasoline    | US\$ 12,590 |

Cost of water supply and electricity are paid by MOH

Number of staff

143 staff is working in CENAT for TB program.

|                                |    |
|--------------------------------|----|
| Doctors and Medical Assistants | 39 |
| Nurses                         | 66 |
| Pharmacists                    | 7  |
| Laboratory staff               | 11 |
| X-ray staff                    | 5  |
| Drivers                        | 4  |
| Other staff                    | 11 |

(6) Present Activities

The major activities of program are;

Activities of CENAT in 1996

CENAT is the national referral center for TB, also the dispensary for the residents of Phnom Penh.

|   |          |
|---|----------|
| - Number of new sputum positive cases found   | 1,103    |
| - Number of X-ray positive cases found  | 618      |
| - Number of patients started treatment  | 814      |
| - Cure rate of sputum positive patients   | 78%      |
| - Number of Sputum examinations   | 16,651   |
| - Number of X-ray taken   | 1,068    |
| - Detection rate by sputum examinations   | 68.7%    |
| - Total number of days for supervision to provinces   | 128 days |
| - Conduct quarterly Quality Control for sputum examination  |          |
| - Conduct the Annual Seminar and work shop  |          |
| - Conduct 5 sessions of training for Medical Doctors and Laboratory Technicians of Provincial and district level. |          |
| medical staff   | 168      |
| laboratory staff  | 78       |
| - Issue Annual Report in 1996   |          |

|  |         |
|--|---------|
| Activities of 123 hospitals in 1996;       |         |
| - Number of Case finding                   | 15,265  |
| - Number of Patients started treatment     | 14,141  |
| - Cohort analysis sputum positive patients |         |
| Cure rate                                  | 85%     |
| Completion rate                            | 6%      |
| Mortality rate                             | 2%      |
| Fail rate                                  | 1%      |
| Abandoned rate                             | 4%      |
| Transferred rate                           | 1%      |
| - Number of Sputum examinations            | 139,908 |
| - Detection rate by sputum examinations    | 80%     |

(7) Any assistance from other donor Agencies.

WHO: WHO stationed an expert until March 1997, but there is no longer substantial support from it.

WFP : WFP has provided food for all TB patients

JICA : Technical Equipment provision for culture examination and technical support for laboratory.

### 3. Project Proposal

#### 3-1. Justification of the proposed Project

##### (1) Description of the disease

Tuberculosis is an infectious disease which is the commonest cause of death in adults. It is caused by *Mycobacterium tuberculosis* and spread by exposure to airborne droplets produced by persons with pulmonary Tuberculosis during coughing, sneezing etc.

Around 5% the initial infection may progress to pulmonary or other forms of tuberculosis. If untreated, about half of the patients die within a two year period. Appropriate chemotherapy nearly always results in a cure.

There is another problem related Tuberculosis Control That is HIV infection. When HIV infection increases, tuberculosis also increases. Because someone is infected with HIV, the virus weaken their immune system. If the people infected tuberculosis, then become infected with HIV, they can no longer fight the tuberculosis, and they develop tuberculosis. So the tuberculosis and HIV should be controlled together.

(2) Present situation of the sector and necessity of the Project

A. Situation of the National Tuberculosis Control Program (NTP)

A-1 National strategy

The policy of NTP are ;

1. Government commitment to NTP.
2. Case detection through predominantly passive case finding.
3. Administration of directly observed treatment with short course chemotherapy (DOTS).
4. Establishment of a system of regular drug supply
5. Establishment and maintenance of a monitoring system

The guideline of NTP is attached. (attachment 6)

A-2 Historical Background

1970-1980 Due to the war situation, tuberculosis control activities did not function.

1979 Ministry of Health invited the French Red Cross through the Cambodian Red Cross to collaborate in the establishment of the National Tuberculosis Control Program.

The program was restarted the Center National Anti-Tuberculosis (INAT) established, later INAT was strengthened and became CENAT.

1991 The WHO/WPR Regional Adviser undertook a mission to review the Program. On the basis of the Mission findings, WHO/WPR assigned a short-term consultant to advise and to develop a master plan for tuberculosis control,

1992 JICA assigned a short-term expert of tuberculosis control to make a study of future feasibility of technical cooperation in the field of tuberculosis control.

1994 A new NTP has started,

1996-1997 Research Institute of Tuberculosis, Japan Anti-Tuberculosis Association sponsored and technically assisted in the national seminar for the NTP workers, both of which offered an important chance of training and motivation to the personnel from all over the country.

#### A-3 Role of CENAT

- To make NTP policy
- To make annual plan
- To train the personnel concerning TB
- To supervise and evaluate hospitals which are implementing NTP
- To make plan of logistics for TB drugs and Laboratory equipment
- To maintain Microscopy Network
- To coordinate with other organizations
- To conduct researches

#### A-4 Present situation of NTP

NTP has been implemented in 123 hospitals and coverage of DOTS is approximately 90% of the population of Cambodia. In the past 3 years under the new program, case finding and case holding rate has been remarkably increased. 1,830 new smear positive tuberculosis cases have been started on treatment in 1994, 3661 cases in 1995 and 12,065 cases in 1996. But The tuberculosis problem in Cambodia is still very serious. The level of transmission is one of the highest in the world. It is estimated that annually 20,000 new smear-positive cases develop.

Also there are still many difficulties for implementing NTP such as; lack of well trained personnel, lack of regular supervision in the field and lack of systematic strategy against increasing threat of HIV/TB epidemics etc.

And there is another, very serious problem in Cambodia concerning about NTP. That is very high prevalence of HIV infection. Estimated HIV infected people are about 70,000 to 120,000. Also estimated HIV/TB new case is 1,572 in 1996. The prevalence of HIV/TB is rising rapidly, and effective control are more important now than ever before.

Additionally after WHO TB advisor left in March 1997, no international agency has advisors for NTP, except laboratory technique.

## B. Necessity of the project

To reduce the incidence of tuberculosis, Ministry seeks the introduction of systematic strategy against tuberculosis via the training of personnel working in the NTP.

Following technical transfer is needed by the team of experienced experts.

1. High-quality implementation of treatment through coordination of GOs and NGOs related with NTP in the field.
2. Nation wide TB surveillance system.
3. Methodology of conducting the researches for knowing present situation of TB in Cambodia. And according to the results, NTP will be planed effective activities.
4. High quality of training technique to the relevant personnel to increase knowledge of NTP for the provision of good medical services.
5. High quality of laboratory technique.
6. High quality of equipment maintenance technique.
7. High quality of X-ray technique.
8. Development of the materials for patient education and public awareness.

Therefore implementation of the project must be necessary.

## (3) Sectoral Development Policy, and Priority in the National Development plan.

In the Health Coverage Plan for Cambodia, the necessity of tuberculosis control program is clearly described and the Ministry of Health put as first priority in public health program. Tuberculosis is different from other communicable disease and is the commonest cause of death in adults in Cambodia, and almost patient are poor, period of treatment is very long (at least 8 months) and the patients should not stop taking drugs during treatment, otherwise they would easily create drug resistant, also the cost of treatment is approximately US 140 dollar for 1 patient. Due to above mentioned reason, Government has provided treatment free of charge.

Also National Tuberculosis Control Program has very strong Government commitment such as; the National Anti tuberculosis Committee is organized with Samdach Hun Sen, the second Prime Minister as the honorary Chairman, His Excellency Dr. Chhea Thang, Minister of Health as the chairman, and His Excellency Dr. Dy Narongrith, secretary of state as vice chairman.

(4) Problems to be solved

During the National Tuberculosis Conference and Workshop in 1997, the problems of NTP are indicated.

1. Insufficient buffer stock of drugs and laboratory equipment and reagents in all levels,
2. Need to promote DOTS to all patients
3. Lack of decentralized of tuberculosis case detection
4. Too high sputum examination positivity among suspects
5. None existence of TB/HIV treatment guideline
6. Poor contribution of private practitioner to NTP
7. Poor information about tuberculosis prevalence
8. Poor training materials and facilities for all section of NTP
9. Insufficient financial resources which effects planing and management of NTP.
10. Lack of equipment maintenance system

3-2. Goals and Objective of the Project

The long-term, overall objectives of the NTP are :

- To reduce the incidence and prevalence of tuberculosis in Cambodia.
- To reduce the physical and psycho-social suffering of the population from tuberculosis.
- To reduce the incidence of disabilities and deformities caused by tuberculosis.

In such a way that tuberculosis no longer remains a public health problem.

The short-term, specific objectives of the Project are :

- To Maintain cure rate more than 85% and reduce the transmission of tuberculosis in the community.
- To increase case-finding to 70 %
- To reduce the patient's and doctor's delay and treat smear positive cases with DOTS.

## 3-3 Project Outputs and Activities

| Outputs  | Activities  |
|--|---|
| I Strengthen NTP   |   |
| 1-1 Maintain cure rate more than 85%                               | <ul style="list-style-type: none"> <li>- Technical Advice by experts</li> <li>- Training to the personnel working in the NTP for systematic strategy against tuberculosis</li> <li>- Establishment of buffer stock system</li> <li>- Training to the supervisors in central and provincial levels for evaluation and monitoring activities.</li> </ul>                                    |
| 1-2 Expand DOTS  | <ul style="list-style-type: none"> <li>- Technical Advice by experts</li> <li>- Training to the personnel working NTP for systematic strategy against tuberculosis</li> <li>- Establishment of buffer stock system</li> </ul>   |
| 1-3 Strengthen Microscopy Network and increase case finding to 70% | <ul style="list-style-type: none"> <li>- Technical Advice by experts</li> <li>- Training for supervisors in central and provincial level for microscopy technique.</li> <li>- Establishment of buffer stock system</li> <li>- Introducing adequate quality control system</li> <li>- Providing binocular Microscopes</li> <li>- Establishment of microscopy maintenance system</li> </ul> |
| 1-4 Improve evaluation and monitoring of NTP                       | <ul style="list-style-type: none"> <li>- Technical Advice by experts</li> <li>- Training to supervisors in central and provincial level for the skill of supervision</li> <li>- Introducing TB surveillance system</li> <li>- Technical Advice for computer analyses</li> <li>- Establishment evaluation standard</li> </ul>  |



Outputs

Activities

2 Strengthen CENAT as the National Referral Center

2-1 Development of training materials and facilities  
Improvement fo training technique

- Technical Advice by experts
- Revision of NTP Manual
- Development of Training Modules
- Development of Health Education Materials
- Increasing library capacity as a center of training
- Improvement of laboratory training facilities
- Improvement of X-ray training facilities

2-2 Conduct Technical research

- Technical Advice by experts
- Methodology of research promotion of

2-3 Strengthen monitoring system

- Introducing TB surveillance system
- Technical Advice for computer analyze
- Establishment valuation standard

2-4 Strengthen Planning for NTP

- Technical Advice by experts
- Establishment of standard

3 Coordinate between CENAT and other organizations and private practitioner

- Technical Advice by experts
- Promotion of meetings

### 3-4 Expected Target Group

#### Beneficiaries

TB Patients by treatment

Community by cut the chain of infection

### 3-5 Expected Field of Activities of JICA Expert

#### Long - Term Expert

TB Control 1 person, 5 years

Health Education 1 person, 5 years

Laboratory technology 1 person, 5 years

Radiology 1 person, 5 years

Aid Coordination 1 person, 5 years

#### Short-Term Expert

Epidemiology 1 person

Logistics 1 person

Equipment Maintenance 1 person

### 3-6 Expected Counterparts Training

TB control course 1 person / year

National Tuberculosis program management course 1 person / year

Laboratory Management course 1 person/year

AIDS control course 1 person / year

X-ray maintenance course 1 person / year

### 3-7 Required Equipment and Materials

- Equipment for microscopy training

- Training materials for health education

- Laboratory equipment for drug resistant research

- Medical books

- Computers

- X-ray machine

- Photocopy machine

### 3-8 Estimated Starting Date and Duration of the Project

From April, 1999 for 5 years

3-9 Any Relation with Grant aid Proposal

The proposal for grant aid regards for the renovating TB center in Phnom Penh will be submitted to The Japanese Government soon.

4. Situation of Project Facilities

4-1 Existing Building, Facilities and Equipment for the project

There are 4 buildings in National Tuberculosis Center (CENAT): attached TB hospital, Building are shared for Administration, dispensary, technical bureau, accountant, IDR room, laboratory, X-ray section, pharmacy, library, stores and garage but all building are old and narrow.

4-2 Counter part personnel and Administration staff

Director 1, Vice Director 1, Chief of laboratory 1, Chief of X-ray section 1, Medical Doctor 39, Chief of pharmacy 1.

4-3 Project budget

Running cost : Government

5. Other Pertinent Information

5-1 Relation with other Japanese cooperation projects

One individual expert for laboratory has been dispatched since April 1995.

5-2 Any assistance from other donor agencies.

WFP is supporting food for all TB patients, WHO has supported for NTP and has dispatched one expert in Phnom Penh, but he left March 1997. MSF is supporting " Home delivery research " in Phnom Penh.

5-3 Information on the security conditions on the project site

The center is located in the center of capital city

5-4 Any poverty reduction components of the project.

Tuberculosis is the commonest cause of death in adults aged is 15 to 49 in Cambodia. These deaths have an enormous social impact on families and communities. By treating the patients of will be contribute to improve daily life.

5-5 Other negative social and cultural impacts by the implementation of the project.

NONE

⑩無償資金協力要請の概要

## 無償資金協力要請の概要

### 1. 目的：

- カンボディアにおける国家結核プログラム（NTP）の中心としての国立結核センターの確立。
- 運営・臨床活動において結核のリファレルセンターとしての機能の強化。
- NTPに関わる人材の育成および監督を行うセンターとしての機能の強化。

### 2. 要請内容（見積り総額 約8億3700万円）：

#### (1) 施設改修（見積り額 約7億4260万円）

現在独立した建物となっている管理棟（1950年代築）、図書・鍼棟（1980年代築）、ガレージ（1980年代築）、実験室・X線・薬剤棟（1960年代築）を建て替え、下記のユニットを有するセンターを建築する。

- プログラム運営ユニット：NTP実施の決定を行う。
- 事務管理ユニット：公式文書、図書、施設メンテナンス等を扱う。
- 会計ユニット：センターの予算の収支を扱う。
- 技術ユニットNTP実施本部として機能する（研修、州からの四半期報告、NTPのモニタリング、抗結核薬の支給計画等）
- 実験室ユニット：カンボディアのリファレンス・ラボとしての機能を負う。
- X線ユニット：X線検査、放射線研修、放射線の研究を行う。
- 薬剤ユニット：付属病院に対する抗結核薬の供給・管理、実験室器具の管理を行う。
- 外来ユニット：外来患者に対する結核診断や、州病院のリファレル機能等を有する。
- ガレージ・運転手ユニット：車両のメンテナンス、駐車等

なお、現存の5病棟はそのまま残す。

#### (2) 上記（1）の結核センター内に入れる機材の供与（見積り額 約9440万円）

運営機能の強化・研修実施・リファレンスラボ機能に必要な機材。具体的には、各ユニットに必要な机、椅子、インターホン、医療機器、空気調整機等。

### 3. 維持管理体制：

#### (1) 予算措置

- カンボディア側予算：NTP職員への給与、建物・機材のメンテナンス、電気・水道・車両のオペレーション・コスト
- 世界銀行からの貸付：抗結核薬、実験室器具、車両、監督・研修費用

#### (2) 運営

センター所長と副所長が全体責任を負う。運営方法に関してはプロ技の専門家が指導する。

#### (3) メンテナンス

新しい建物と機材のメンテナンス方法は建築業者およびプロ技の専門家により指導される。併せて、CENATはメンテナンスマニュアルを用意し、職員自らが維持管理できるようにする。

#### (4) 人員配置

現在いる職員143名で対応可能。

以上

# ៧ ព្រះរាជាណាចក្រកម្ពុជា របាយការណ៍ស្តីពីជំងឺរមេង



DOTS WIDELY



**KINGDOM OF CAMBODIA**  
**TUBERCULOSIS REPORT**

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# អត្ថន័យនៃការកម្រិត



DOTS widely

ក្នុងឆ្នាំ ១៩៩៤ ក្រសួងសុខាភិបាល ដោយសហការជាមួយ អង្គការសុខភាពពិភពលោក បានដាក់ចេញកម្មវិធីជាតិកំទាត់ ជំងឺរបេងធ្វើមួយក្នុងគោលបំណងធ្វើអោយមានការធានាថា គ្មាន ចំលងជំងឺរបេង ដោយធ្វើអោយកាន់តែតែឡើងជាមួយប្រជាជន ដែលគ្រោះថ្នាក់ស្បែក និង បញ្ហាមន្តសិក្សាស្រាវជ្រាវ ។

ការព្យាបាលដោយត្រួតពិនិត្យផ្ទាល់ជាមួយបន្ទុយ: រោងឡី (ដុតស័) ត្រូវបានដាក់ឱ្យព្យាបាលជាង ៩០ ភាគរយ លើប្រជាជន ទាំងអស់ និងត្រូវរៀបចំបាន ៩០ ភាគរយ ដែលព្យាបាលកំទាត់ជំងឺរបេង ទូទាំងប្រទេស (១១០ / ១២២ បណ្តាញ) ។ បណ្តាញរបេង ត្រូវបានរៀបចំប្រើប្រាស់កាន់តែច្រើនទៀត និងជិត ៥០ មណ្ឌល សុខភាព (ដែលបម្រើជាមន្ទីរពេទ្យស្រុក) ។ ៩២ ភាគរយ នៃអ្នកជំងឺរបេងទាំងអស់ ដែលទទួលបានការព្យាបាលក្នុងមន្ទីរពេទ្យ សាធារណៈទាំង ១១០ សុទ្ធតែបានជាសះស្បើយដោយសារ អនុវត្តដុតស័ ។

ការព្យាបាលដោយត្រួតពិនិត្យផ្ទាល់ (អ្នកស័) និងកម្មវិធីជាតិ និងផ្តើមបង្រៀនដល់ស្រីស្រី និង សិស្សវិទ្យាល័យក្រៅសាលាឆ្នាំ ១៩៩៧ ។ ជាមួយគ្នាមាន អ្នកជំងឺជាភរិយា និង ជាម្តាយ ក៏ត្រូវទទួលបានការស្រាវជ្រាវ និងព្យាបាលដោយ កម្មវិធីជាតិផង ។

អ្នកស័ ជាមែកជាងសំខាន់មួយរបស់សេវាសុខាភិបាល និងជា

ផ្នែកមួយរបស់ជំងឺស្បែក ។ បែបការ សមាហរណកម្ម យុទ្ធសាស្ត្រ ដែលវិញ្ញាប្បទាន និងនិរន្តរភាពផ្តល់ដោយកម្រិតកម្រិត ជាមែកជាង មួយរបស់ការកែទម្រង់សុខាភិបាល ។ ការកែទម្រង់ប្រកបដោយ អត្រាជាសះស្បើយដែលល្អ ត្រូវបានចាត់ទុកថាជាកម្រិតខ្ពស់ ហើយនិងត្រូវ កែលម្អអត្រាស្រាវជ្រាវ ។ អត្រាស្រាវជ្រាវនិងត្រូវបង្កើតជាលំដាប់ លំដោយ ដោយសារការកំទាត់របស់អ្នករាង គឺជា ដែលជំនួយនេះ អាចលាតសន្ធឹង ទូទាំងប្រទេសនៅឆ្នាំ ១៩៩៧ និងដោយសារការ រួមគ្នាផ្ទាល់ មណ្ឌលសុខភាព ។ ស្វយភាពនៃវិញ្ញាប្បទាន ជាសំខាន់ស្របទៅនឹងក្រសួងសុខាភិបាល ដែលត្រូវទទួលបានការ ពិភពលោកឆ្នាំ ១៩៩៧ នេះទៅ ។

ទស្សនៈវិស័យថ្មីនៃសេវា របេង-ហ៊ីវ ទៅក្នុងសហគមន៍ និងការ ប្រើប្រាស់ អ្នកស័ ដោយត្រូវពេញលេញ/សាធារណៈត្រូវ បានសាងសង់ ទៅក្នុងពេញ អំពីការអនុវត្ត ដុតស័ ក្នុងការផ្តល់ឱសថឱ្យអ្នកជំងឺ ដល់ផ្ទះ ។

គ្មានការស្រាវជ្រាវលើទេ ដែលកម្មវិធីជាតិកំទាត់ជំងឺរបេងនៅកម្ពុជា ទទួលបានជោគជ័យ ។ ការអភិវឌ្ឍន៍ផ្តល់នេះ បានដោយសារការ ចូលរួមរបស់រដ្ឋាភិបាល បុគ្គលិកសុខាភិបាលបានត្រូវលើកទឹកចិត្ត និងការផ្គត់ផ្គង់ឱសថរបេងមានភាពទៀងទាត់ ។ កម្មវិធីនេះនឹងនៅ ជាអនាគតទី ១ របស់ក្រសួងសុខាភិបាលកម្ពុជា ១៩៩៧ ហើយនៅពេល សកម្មភាពទៅក្នុងសេវាព្យាបាលក្នុងប្រទេស ។

The Ministry of Health, in collaboration with WHO, launched a new national tuberculosis programme (NTP) in 1994, aiming at decreasing tuberculosis transmission first by improving the results of the cure rate and then improving case-detection.

Directly Observed Treatment with Short course chemotherapy or DOTS is provided to more than 90% of the country population in 90% of the Tuberculosis units (110 / 122). Tb units have been set up in most of the referral hospitals and in nearly 50 health centers (previous district hospitals) with Tb units. DOTS cure 92% of the Tb patients who enter one of the 110 DOTS hospitals.

Training on Tb control programme started in the Faculty of Medicine. The Nursing school will also be considered for this kind of training in 1997. Military personnel and prisoners are already beneficiaries of the Tb programme.

DOTS is a vital component of health services which forms part of lung health. Decentralization, integration, new funding mechanisms and

bridges to the private sector are included in the health reform. It aims at insuring the same cure rate and a better case detection. Case detection is expected to increase gradually respectively with the extension of the World Food Programme (WFP) support in 1997 and with a greater involvement of the peripheral health structures. Sustainable financial resources will mainly depend on the World Bank loan to the Ministry of Health in 1997.

New perspectives of a community-based TB/HIV care services and of government/private practitioners to use DOTS are conducted through a home care delivery DOTS pilots study in Phnom Penh.

There is no doubt that the national tuberculosis programme in Cambodia is a success. This development is largely due to the government commitment, mobilization of health care workers and a stable supply of anti-tuberculosis drugs. Tb control will remain the number one priority of the Ministry of Health in 1997 and the leading activity in the country's health care centers.

# CONTROL ACTIVITIES

# កំណត់សម្គាល់

## Case finding



The annual number of new smear-positive cases notified by the programme increased from 5,579 in 1982 till 12,163 in 1996, i.e. an increase of 99% or 7.6% per year on the average. The annual number of cases, all forms of tuberculosis, increased from 8,475 in 1982 till 15,265 in 1996, i.e. an increase of 72% or 5.6% per year. During this period the population increased from about 6 million in 1982 to about 10.3 million in 1996, i.e. an increase of 67% or on the average 5.1% per year. (see Table 1, Table 2 and Figure 1, Figure 2).

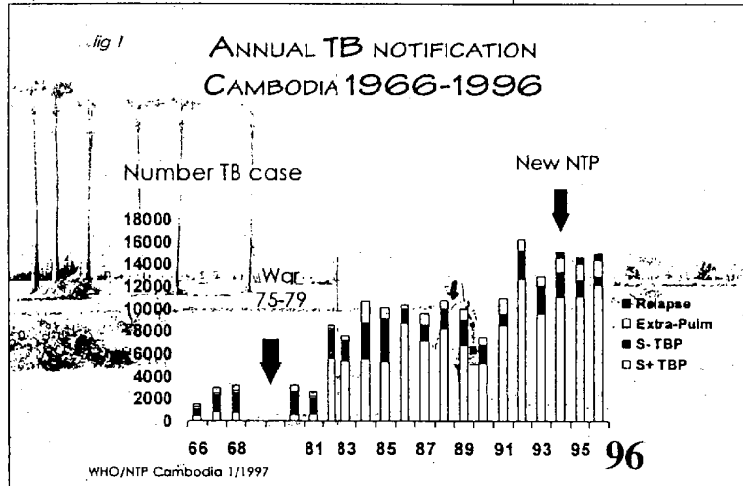
The case-detection rate of new smear-positive cases was 95 per 100,000 population in 1982 and 130 per 100,000 population in 1996, i.e. an average increase of 2% per year. The case-detection rate of cases, all forms of tuberculosis, per 100,000 population was 144 in 1982 and 153 in 1996. (see Table 1).

Information about the site of the disease, available of 15265 new cases reported in 1996 shows that 85% had smear-positive pulmonary tuberculosis, 5% had smear-negative pulmonary tuberculosis and 10% had extra-pulmonary tuberculosis. Information about age and sex is available of 13232 (87%) of the TB cases. The male/female ratio observed was 0.99, higher than in most of the countries (around 0.7). This high ratio reflects the general population imbalance in favor of women due to the war and the genocide among adult cohorts (see Table 3 and Figure 3).

### ការស្រាវជ្រាវរកជំងឺ

ចំនួនអ្នកមានវិជ្ជមានបេកា ក្នុងកំណាត់ប្រចាំឆ្នាំ មានការកើនឡើងពី ៥.៥៧៩ ក្នុងឆ្នាំ ១៩៨២ រហូតដល់ក្នុងឆ្នាំ ១៩៩៦ មានការកើនឡើងដល់ ៩៩% ឬ ៧.៦% ក្នុងមួយឆ្នាំ ។ ចំនួនអ្នកជំងឺប្រភេទផ្សេងៗ សរុបគ្នាបានកើនឡើងពី ៨.៤៧៥ ក្នុងឆ្នាំ ១៩៨២ ដល់ ១៥.២៦៥ ក្នុងឆ្នាំ ១៩៩៦ មានការកើនឡើង ៧២% ក្នុងមួយឆ្នាំ ។ ក្នុងរយៈពេលនៃរយៈកំណត់ ប្រជាជនបានកើនឡើងពី ៦ លាន ក្នុងឆ្នាំ ១៩៨២ រហូតដល់ ១០.៣ លាននាក់ ក្នុងឆ្នាំ ១៩៩៦ គឺឡើង ៦៧% ក្នុងមួយឆ្នាំ ។ (មើលតារាង១,២ រូបភាព១,២)។

អត្រាស្រាវជ្រាវរកជំងឺ វិជ្ជមានបេកាក្នុងកំណាត់មាន ៩៥ នាក់ ក្នុងចំនួនប្រជាជន ១០០.០០០ ក្នុងឆ្នាំ ១៩៨២ និង ១៣០ នាក់ ក្នុងចំនួនប្រជាជន ១០០.០០០ នាក់ ក្នុងឆ្នាំ ១៩៩៦ គឺកើន ២% ក្នុងមួយឆ្នាំ ។ អត្រាស្រាវជ្រាវរកជំងឺ សរុបគ្នាក្នុងមួយឆ្នាំ ១៤៤ / ១០០.០០០ នាក់ ក្នុងឆ្នាំ ១៩៨២ និង ១៥៣/១០០.០០០ក្នុងឆ្នាំ ១៩៩៦ (មើលតារាង១) ។



របាយការណ៍ស្តីពីជំងឺអេស៊ីដូស៊ីស និង បេកា ដែលមានការពាក់ព័ន្ធនឹងការកើនឡើងនៃជំងឺអេស៊ីដូស៊ីស ក្នុងកំណាត់ប្រចាំឆ្នាំ ១៩៩៦ បានបង្ហាញថា : ៨៥% ក្នុងចំណោមអ្នកជំងឺវិជ្ជមានបេកាក្នុងកំណាត់ ៥% ក្នុងចំណោមអ្នកជំងឺបេកាស្រាវជ្រាវរកជំងឺប្រភេទផ្សេងៗ សរុបគ្នាបានកើនឡើងពី ៨.៤៧៥ ក្នុងឆ្នាំ ១៩៨២ ដល់ ១៥.២៦៥ ក្នុងឆ្នាំ ១៩៩៦ មានការកើនឡើង ៧២% ក្នុងមួយឆ្នាំ ។ ក្នុងរយៈពេលនៃរយៈកំណត់ ប្រជាជនបានកើនឡើងពី ៦ លាន ក្នុងឆ្នាំ ១៩៨២ រហូតដល់ ១០.៣ លាននាក់ ក្នុងឆ្នាំ ១៩៩៦ គឺឡើង ៦៧% ក្នុងមួយឆ្នាំ ។ (មើលតារាង១,២ និង រូបភាព១,២) ។



# Diagnosis

The method for case-finding of tuberculosis cases used by the programme is based on identification and examination of self-reporting suspects, who attend the general health services institutions. If identified at an institution without diagnostic facilities, suspects are referred to one of the present 122 diagnostic centers.

The number of slides examined by the programme increased from 64,878 in 1993 till 82,329 in 1994, 121,236 in 1995 and 141,620 in 1996, i.e. an increase of about 130% in three years. The total number of slides examined by the programme in 1996 was on the average about 1,000 per year or 5 per working day per laboratory. (see Table 4)

From 1994 to 1996, 30% in some centers as high as 50 to 60% of first sputum samples examined from suspects were reported to be positive by the programme. In 1996, 11,407 slides (29%) in 36,275 first slides were reported positive.

Some 20% of diagnosed cases are not treated at the place of the laboratory examination, particularly at the provincial level. However, when analyzing the national statistics for 1995 and 1996, it was observed that the number of smear-positive cases reported by the laboratories was below the number of positive cases notified by the tuberculosis centers, i.e. the ratio cases diagnosed/cases put on treatment was 88% in 1996.

X-ray facilities are available in Phnom Penh and in the major provincial hospitals. According to the official policy chest X-ray examination is only indicated after six negative smear results and when strong suspicion of tuberculosis remains. The interval between the two series of three slides is two to four weeks. During this period, the patients are treated with two courses of different general antibiotics to exclude possible infections with other bacteria.

# Quality control of sputum examinations

A quality control system was introduced at the start of the new programme. Samples of positive and negative slides are sent to the central laboratory in the Centre National AntiTuberculeux (CENAT) every quarter for rereading. In 1996, 5208 i.e. 4% of all slides were reexamined, 5% of the positive slides of routine laboratories were considered false-positive and 3% of the negative slides were considered false-negative. Total disagreement was 5%. Results in 1995 were similar. (see Table 5)

# Susceptibility testing against anti-tuberculosis drugs

(from Centers for Disease Control and prevention - Division of tuberculosis Elimination - Atlanta, Georgia, USA).  
Susceptibility testing against anti-tuberculosis drugs performed in the United States by the Centers for Diseases Control, among 238 new tuberculosis cases who were born in Cambodia and who had immigrated during the past 20 years, showed low primary resistance. Levels of resistance to isoniazid and streptomycin were less than 5%; resistance to rifampicin, ethambutol, pyrazinamide, and isoniazid plus rifampicin were less than 1%. Levels of resistance did not vary by years in the United States.

## លទ្ធផលសរុប

របៀបស្រាវជ្រាវករដំបូងដែលបានប្រើប្រាស់កម្រិតវិញ្ញាណកម្មធុនទាប គឺមានអាយុកាលយូរ និង ការពិនិត្យផ្ទាល់ទៅជាមួយគ្នាដែលបានស្រាវជ្រាវតាមផ្ទះគ្រួសារឯកលក្ខណ៍ ដោយគាត់មានការងារមួយចំនួនក្នុងផ្ទះ ។ លើសពីនេះក៏បានឃើញថាមានការងារច្រើន ព្រមទាំងមានការងារនៅទីកន្លែងផ្សេងៗទៀតផងដែរ និងមានការងារលើកិច្ចការផ្សេងៗទៀតផងដែរ ក្នុងចំណោម ១២២ ដែលមានបណ្តាញបេក្ខ

តាមតេឡេទ្រាមដែលបានពិនិត្យលើសមាគមកើតឡើងពី ៦៤.៨៧៨ ក្នុងឆ្នាំ ១៩៩៣ រហូតដល់ ៨២.៣២៩ ក្នុងឆ្នាំ ១៩៩៤ ។ ១២១.២៣៦ ក្នុងឆ្នាំ ១៩៩៥ និង ១៤១.៦២០ ក្នុងឆ្នាំ ១៩៩៦ គឺបានឡើង ១៣០ ភាគរយ ក្នុងរយៈពេល ៣ ឆ្នាំ ។ ក្នុងឆ្នាំ ១៩៩៦ ចំនួនគ្រាប់ស្រាវជ្រាវ ដែលបានពិនិត្យដោយមន្ត្រីរបស់ខ្លួន ១០០០ ក្នុង ១ ឆ្នាំ ឬ ស្មើនឹង ៥ គ្រាប់ ក្នុង ១ ថ្ងៃ ក្នុងមន្ទីរពេទ្យរាជធានីភ្នំពេញ ។ (មើលតារាង ៤)

ក្នុងឆ្នាំ ១៩៩៤ ដល់ ១៩៩៦ ការពិនិត្យកម្រិតវិញ្ញាណកម្មធុនទាបលើសមាគមរបស់ខ្លួន គឺបានឡើងចាប់ពី ១៩៩៤ ក្នុងឆ្នាំ ១៩៩៦ មាន ១១.៤០៧ គ្រាប់ ( ២៩ភាគរយ ) ដែលបានឡើងចាប់ពី ៣២.៥៧៥ គ្រាប់ក្នុងឆ្នាំ ១៩៩៦ ដល់ ៥០.១៧៦ គ្រាប់ក្នុងឆ្នាំ ១៩៩៧ គឺបានឡើងចាប់ពី ៥០ ទៅ ៦០ ភាគរយ ។



នៅតាមបណ្តាញខេត្តកំពង់ឆ្នែង ២០ ភាគរយ ដែលបានឡើងចាប់ពី ១៩៩៤ ដល់ ១៩៩៦ គេសង្កេតឃើញថាមានកម្រិតវិញ្ញាណកម្មធុនទាបលើសមាគមរបស់ខ្លួន ដែលបានឡើងចាប់ពី ១៩៩៤ ដល់ ១៩៩៦ មាន ១១.៤០៧ គ្រាប់ ( ២៩ភាគរយ ) ដែលបានឡើងចាប់ពី ៣២.៥៧៥ គ្រាប់ក្នុងឆ្នាំ ១៩៩៦ ដល់ ៥០.១៧៦ គ្រាប់ក្នុងឆ្នាំ ១៩៩៧ គឺបានឡើងចាប់ពី ៥០ ទៅ ៦០ ភាគរយ ។

វិទ្យាសាស្ត្រមេតេរីយ៉ាតធានាបានកម្រិតវិញ្ញាណកម្មធុនទាបលើសមាគមរបស់ខ្លួន គឺបានឡើងចាប់ពី ១៩៩៤ ដល់ ១៩៩៦ មាន ១១.៤០៧ គ្រាប់ ( ២៩ភាគរយ ) ដែលបានឡើងចាប់ពី ៣២.៥៧៥ គ្រាប់ក្នុងឆ្នាំ ១៩៩៦ ដល់ ៥០.១៧៦ គ្រាប់ក្នុងឆ្នាំ ១៩៩៧ គឺបានឡើងចាប់ពី ៥០ ទៅ ៦០ ភាគរយ ។

## គុណភាពនៃការពិនិត្យវិញ្ញាណកម្មធុនទាប

របៀបបេក្ខពិនិត្យកម្រិតវិញ្ញាណកម្មធុនទាបលើសមាគមរបស់ខ្លួន គឺបានឡើងចាប់ពី ១៩៩៤ ដល់ ១៩៩៦ មាន ១១.៤០៧ គ្រាប់ ( ២៩ភាគរយ ) ដែលបានឡើងចាប់ពី ៣២.៥៧៥ គ្រាប់ក្នុងឆ្នាំ ១៩៩៦ ដល់ ៥០.១៧៦ គ្រាប់ក្នុងឆ្នាំ ១៩៩៧ គឺបានឡើងចាប់ពី ៥០ ទៅ ៦០ ភាគរយ ។

## ការធ្វើតេស្តសម្រាប់រកមេតេរីយ៉ាតធានាបានកម្រិតវិញ្ញាណកម្មធុនទាប

ការធ្វើតេស្តសម្រាប់រកមេតេរីយ៉ាតធានាបានកម្រិតវិញ្ញាណកម្មធុនទាបលើសមាគមរបស់ខ្លួន គឺបានឡើងចាប់ពី ១៩៩៤ ដល់ ១៩៩៦ មាន ១១.៤០៧ គ្រាប់ ( ២៩ភាគរយ ) ដែលបានឡើងចាប់ពី ៣២.៥៧៥ គ្រាប់ក្នុងឆ្នាំ ១៩៩៦ ដល់ ៥០.១៧៦ គ្រាប់ក្នុងឆ្នាំ ១៩៩៧ គឺបានឡើងចាប់ពី ៥០ ទៅ ៦០ ភាគរយ ។



# hemotherapy

DISTRIBUTION OF TREATMENT CATEGORY ON 14,141 TB CASES IN 1996  
(93% OF TOTAL CASES IN 1996 - 15,265 TB CASES -)

|              | Cat.1       | Cat.2      | Cat.3      | Cat.4       | Total        |
|--------------|-------------|------------|------------|-------------|--------------|
| S+ TBP       | 9033        | 775        | 0          | 2322        | 12128        |
| S-TBP        | 299         | 10         | 263        | 82          | 654          |
| EP           | 628         | 14         | 587        | 128         | 1357         |
| <b>Total</b> | <b>9960</b> | <b>799</b> | <b>864</b> | <b>2532</b> | <b>14141</b> |
| <b>%</b>     | <b>70%</b>  | <b>6%</b>  | <b>6%</b>  | <b>18%</b>  | <b>100%</b>  |

ក្នុងឆ្នាំ ១៩៩៤ យុទ្ធសាស្ត្រព្យាបាលតាមរបៀប ដុតស៍ បានផ្តល់នូវភាពជឿជាក់ច្រើនជាងគ្នា ពីថ្នាក់ស្រុកមួយទៅថ្នាក់ស្រុកមួយទៀត ។ ការព្យាបាលដោយរបៀបនេះពេលខ្លះត្រូវបានពិនិត្យមាន ២៣ ភាគរយ ក្នុងចំណោមបណ្តាញរបបចំណាង ១២៦ ។ អត្រាបានកើន ៥៧ ភាគរយក្នុងឆ្នាំ ១៩៩៥ និង ៩០ ភាគរយ នៅក្នុងឆ្នាំ ១៩៩៦ ។ (តារាងទី ៦ និង រូបភាព ៤)

កម្មវិធីថែទាំបានធ្វើឱ្យការក្រុមការព្យាបាលជំងឺរបបថ្នាក់ខេត្ត រហូតដល់ថ្នាក់ស្រុក ។ នៅឆ្នាំ ១៩៩៣ ម្នាក់ដំបូង ដែលបាន ទទួលការព្យាបាលនៅថ្នាក់ស្រុកមានច្រើន ៤៣ ភាគរយ ប៉ុណ្ណោះ តែឆ្នាំ ១៩៩៦ អត្រានេះបានកើនរហូតដល់ ៧០ ភាគរយ និងកើនឡើងទៀតទៅតាមចំនួនប្រជាជន ។ (តារាងទី ៦)

ការព្យាបាលតាមរបៀប ដុតស៍ មាន ២ ភាគ ៣ នៃជំងឺរបបច្រើននៅសំរាប់រាជធានី ក្នុងក្រុងភ្នំពេញនៃការព្យាបាល និង ១ ភាគ ៣ ទៀតបានទទួលថ្នាំប្រចាំថ្ងៃនៅថ្នាក់ស្រុកចំនួនច្រើន ។

នៅក្រុងព្រៃ មជ្ឈមណ្ឌលជាតិ និង មណ្ឌលសុខភាពស្រុកមានជំងឺ បានចាប់ផ្តើមអនុវត្តការសាកល្បងមួយទៀត ចំពោះម្នាក់ដំបូង មួយចំនួនដែលទទួលបានការព្យាបាលនៅក្នុងក្រុងភ្នំពេញ ដោយបានអនុវត្តការថែទាំតាមផ្ទះម្នាក់ដំបូងជាប្រចាំថ្ងៃ ។ លើសពីនេះការពិនិត្យ កម្រិតធនធានគ្រប់គ្រងថ្នាំប្រចាំថ្ងៃ ប្រសិនបើជំងឺទទួលបានជោគជ័យ ។

ចាប់តាំងពីឆ្នាំ ១៩៩៣ ម្នាក់ដំបូងមួយចំនួន បានទទួលការឧបត្ថម្ភហិរញ្ញវត្ថុបន្ថែមពីកម្មវិធីស្បៀងស្រោចស្រែ តាមរយៈ អង្គការមិត្តភាពស្រុកស្រាវជ្រាវ ក្នុងឆ្នាំ ៤០ ភាគរយ នៃចំនួនក្រុងឆ្នាំ ១៩៩៤ ៦០ ភាគរយ ក្នុងឆ្នាំ ១៩៩៥ និង ៦៦ ភាគរយ ក្នុងឆ្នាំ ១៩៩៦ ។ ការថែទាំតាមស្បៀងបន្ថែមក្នុងឆ្នាំ ១៩៩៦ មានរហូត ៧៥ ភាគរយ ដល់ម្នាក់ដំបូងដែលនិមន្តអនុវត្ត ដោយបានគ្រប់គ្រងជំងឺរបប គ្រប់បណ្តាញទាំងប្រទេសចាប់ពីឆ្នាំ ១៩៩៧ ។ ការផ្គត់ផ្គង់ស្បៀងបន្ថែមនេះ គឺម្នាក់ដំបូងរបបដែលទទួលបានការព្យាបាលក្នុងស្រុកក្នុងចំនួន អន្តរ ៥០០ ក្រាម ក្នុង ១ ថ្ងៃ ក្នុងរយៈពេលសំរាប់ក្នុងម្នាក់ទៀត ។ ចំពោះម្នាក់ដំបូង ដែលទទួលបានការព្យាបាលនៅក្នុងប្រទេស គឺច្រើនទទួលបាន ១៥ គីឡូក្រាមក្នុង ១ ខែ ប្រុងប្រយ័ត្ន រហូតដល់ការព្យាបាល ។ ការស្រាវជ្រាវថែទាំជំងឺរបបក្នុងមន្ទីរពេទ្យ ដែលមានការ ឧបត្ថម្ភពីស្បៀងអាហារពិភពលោកបណ្តាញប្រើប្រាស់បានប្រើប្រាស់ជាមធ្យមស្បៀងបន្ថែមនៃជំងឺចាស់នៅក្រុងភ្នំពេញ (តារាងទី៧) ។

In 1994, the DOTS strategy was gradually introduced district by district. Some 23% of 120 tuberculosis centres were using the short-course regimens. This percentage increased to 57% in 1995 and 90% by end 1996. (see Table 6, Figure 4)

The programme decentralized tuberculosis treatment from the provincial to the district level. In 1993, only 43% of the cases were treated at district level, against 70% in 1996. This is more conform with the population distribution. (see Table 6)

Two third of patients are admitted during the intensive phase for DOTS, the last third of the patients are receiving the intensive phase of treatment on a daily ambulatory basis.

On a pilot basis in Phnom Penh, the CENAT and Mean Chey Health Center with the support of WHO, servants and MSF/F, have started a daily home delivery of intensive phase drugs for a small number of patients. Perspectives of extension to the private sector are important if successful.

The World Food Programme has been providing supplementary food to tuberculosis cases through NGOs in 40%, 60% and 66% of the hospitals respectively since 1993. The feeding in 1996 was provided to 75% of the cases and will be extended to all cases in all the tuberculosis units of the country from 1997. The support involves daily rations of 500 grams of rice during the admission period and monthly rations of 15 kgs of rice during the continuation phase. Case detection in facilities with WFP support is significantly higher than those without food support as case holding is similar. (see Table 7)

# Case holding

The results of 1994 and the first three quarters of 1995 enrolled on Categories I, II and III treatment, five quarters earlier, are presented in detail in Table 8. A regular improvement was noted every quarter. (See Table 8, Table 9 and Figure 5)

The results of treatment are available for 3,661 new smear-positive cases who started on Category I treatment during the first three quarters of 1995, representing 43% of all new smear-positive cases reported during this period. During that period of the total 3,661 cases, 85 % was declared cured, 6 % completed treatment without a smear result, 2 % died, 1 % remained positive (failure), 4 % defaulted and 1 % was transferred out.

During first three quarters of 1995, 421 relapse cases were registered. The results of treatment were evaluated in 227 cases enrolled in hospitals with SCC, i.e. in 55 % of the total relapse cases reported during this period. Of the total 227 relapse cases which were evaluated, 78 % was declared cured, 10 % completed treatment without a smear result, 5 % died, 2 % remained positive, 3 % defaulted and 2 % was transferred out.

During first three quarters of 1995, there were 286 cases in the group failure and treatment after interruption registered. The results of treatment were evaluated in 129 cases enrolled in hospitals with SCC, i.e. in 45 % of the total failure and treatment after interruption cases reported during this period. Of the total 129 cases which were evaluated, 34 % was declared cured, 49 % completed treatment without a smear result, 3 % died, 3 % remained positive, 4 % defaulted and 7 % was transferred out.

The results of treatment are also available from 769 new smear-negative tuberculosis cases started on Category III treatment during first three quarters of 1995 representing 58 % of all new smear-negative cases reported during this period. During that period, of the total 769 cases, 91 % completed treatment, 4 % died, 0 % remained positive, 2 % defaulted and 3 % was transferred out.



លទ្ធផលឆ្នាំ ១៩៩៤ និង លទ្ធផល ៣ ត្រីមាសដំបូងឆ្នាំ ១៩៩៥ នៃការព្យាបាលតាមប្រភេទ ១, ២, ៣ និងលទ្ធផល ៥ ត្រីមាសដំបូង ក្រោយនេះ គឺមានលំអិតជូនក្នុងតារាងទី ៨ ។ ទៅរាប់ត្រីមាស គេសង្កេតឃើញមានភ្នំតិណែនកម្ពុជា មានការកើនឡើងយ៉ាងច្រើន (មើលតារាងទី ៨, ទី ៩ និងរូបភាពទី ៥) ។

មានអ្នកជំងឺរបេងវិទ្ធិមានបេកា ៣,៦៦១ អ្នកជំងឺរបេងវិទ្ធិមានបេកាថ្មី បានចាប់ផ្តើមព្យាបាលតាមប្រភេទ ១ ក្នុងរយៈពេល ៣ ត្រីមាសដំបូងឆ្នាំ ១៩៩៥ មាន ៩៣ ភាគរយ នៃចំនួនជំងឺរបេងវិទ្ធិមានបេកាទាំងអស់ ដែលមាននៅក្នុង រយៈពេលកាលក្នុងកំឡុងពេលនេះ ។ លទ្ធផលសរុបមាន ៣៦៦១ ករណីក្នុងនោះ ៨៥ ភាគរយ បានជាសះស្បើយ ៦ ភាគរយ បានបញ្ចប់ការព្យាបាលដោយមិនបានក្នុងគ្រូលក់ហោត ២ ភាគរយ ស្លាប់ ១ ភាគរយ បរាជ័យក្នុងការព្យាបាល ៤ ភាគរយ លែងបង់ការព្យាបាល និង ១ ភាគរយ ត្រូវបញ្ជូន ទេញ ។

ក្នុងរយៈពេល ៣ ត្រីមាសដំបូងឆ្នាំ ១៩៩៥ មានចំនួនករណីឈាម ៤២១ បានចុះក្នុងបញ្ជី ។ អ្នកជំងឺបានត្រឡប់មកព្យាបាលវិញមាន ២២៧ ករណីនៅក្នុងកម្រិតរយៈពេលដែលសម្បូរ ដូនស៍ គឺមាន ៥៧ ភាគរយនៃចំនួន សរុប ។ ចំនួនសរុប ២២៧ ករណី ដែលបានត្រឡប់មកព្យាបាលវិញនោះ គឺមាន ៧៨ ភាគរយ បានជាសះស្បើយ ១០ ភាគរយ បញ្ចប់ការព្យាបាល ៥ ភាគរយ ស្លាប់ ២ ភាគរយ បរាជ័យក្នុងការ ព្យាបាល ៣ ភាគរយ លែងបង់ការព្យាបាលនិង ១ ភាគរយ បញ្ជូនទេញ ។

ក្នុងរយៈពេល ៣ ត្រីមាសដំបូងឆ្នាំ ១៩៩៥ មានចំនួនករណីអ្នកជំងឺបរាជ័យ និង ម៉ោងថ្នាំព្យាបាល ២៨៦ បានចុះបញ្ជី ។ អ្នកបាន ត្រឡប់មកព្យាបាលវិញ មាន ១២៩ ករណី គឺមាន ៤៥ ភាគរយ នៃចំនួនសរុប ។ ក្នុងចំនួន សរុប ១២៩ ករណី មាន ៣៤ ភាគរយ បានជាសះស្បើយ ៤៩ ភាគរយ បញ្ចប់ការព្យាបាល ៣ ភាគរយ ស្លាប់ ៣ ភាគរយ បរាជ័យក្នុងការព្យាបាល ៤ ភាគរយ លែងបង់ ការព្យាបាលនិង ៧ ភាគរយ បញ្ជូនទេញ ។

អ្នកជំងឺរបេងវិទ្ធិមានបេកាមាន ៧៦៩ ករណីត្រូវបានព្យាបាលដោយប្រភេទ ទី៣ ។ រយៈពេល ៣ ត្រីមាស ដំបូងឆ្នាំ ១៩៩៥ មាន ៥៨ ភាគរយដែលបានការណី ។ ចំនួនសរុប ៧៦៩ ករណី ក្នុងនោះមាន ៩១ ភាគរយបញ្ចប់ការព្យាបាល ៤ ភាគរយ ស្លាប់ ០ ភាគរយ បរាជ័យ ២ ភាគរយ លែងបង់ការព្យាបាលនិង ៣ ភាគរយ បញ្ជូនទេញ ។

Results of treatment with 2ERHZ/6EH in 5,491 new smear positive positive cases enrolled during 1994 and the first three quarters of 1995.

|       | N    | Cured | Ti over | Died | Failure | Default | Transfer | Total |
|-------|------|-------|---------|------|---------|---------|----------|-------|
| 1994  | 1830 | 1255  | 201     | 61   | 33      | 124     | 56       | 1842  |
| %     |      | 69%   | 11%     | 3%   | 2%      | 7%      | 3%       | 77%   |
| 1995* | 3661 | 3128  | 236     | 78   | 36      | 143     | 42       | 3663  |
| %     |      | 85%   | 6%      | 2%   | 1%      | 4%      | 1%       | 100%  |
| Total | 5491 | 4383  | 537     | 139  | 69      | 267     | 98       | 5505  |
|       |      | 80%   | 10%     | 3%   | 1%      | 5%      | 2%       | 100%  |

\* first three quarters of 1995

# អេតិដេមីយ៉ាស៊ី



ជាទូទៅ លទ្ធផលនៃការអង្កេតឧបសគ្គកម្រិតនៃការរីករាលដាលនៃជំងឺបេត និង ជំងឺផ្លូវចិត្តចម្បងកំពុងប្រសើរឡើង មិនត្រូវបានបញ្ជាក់ថាមានការទាក់ទងរវាងទ្រព្យ ( មើលតារាង ៦ ) ។

ឧទាហរណ៍ ការអង្កេតកម្រិតនៃជំងឺបេតក្នុងតំបន់ភ្នំពេញ ១៩៨១ និង ១៩៨៩ បានបញ្ជាក់ឱ្យឃើញថា មានការរីករាលដាលកម្រិតខ្ពស់ ៣៩៣ ក្នុងចំណោមប្រជាជន ៨៦.៣៧ នាក់ មានន័យថា អត្រារាលដាលនៃជំងឺបេតមាន ៤៥៥ ករណីក្នុងមួយប្រជាជន ១០០.០០០ ។ ការអង្កេតឧបសគ្គកម្រិតនៃជំងឺបេត ២៥៨៣ នាក់ នៅឆ្នាំ ១៩៩៥ បានបញ្ជាក់អត្រារាលដាលប្រមាណ ៩៦៦ ករណីក្នុងមួយប្រជាជន ១០០.០០០ នាក់ ទាំងនេះអាចសន្និដ្ឋានបានថា ភាគច្រើននៃអ្នកជំងឺបេតទាំងនេះ មិនដែលបានប្រើប្រាស់ថ្នាំប្រយោជន៍ ។ កិច្ចការអង្កេតឧបសគ្គកម្រិតនៃជំងឺបេតក្នុងតំបន់ភ្នំពេញ ១៩៨១ និង ១៩៨៩ បានបញ្ជាក់អត្រារាលដាលប្រមាណ ១០០.០០០ នាក់ ២១.៥០០ ករណីក្នុងមួយប្រជាជន ១ ឆ្នាំ នៅទូទាំងប្រទេស ។ (មើលតារាង ១០ )

ការស្រាវជ្រាវកម្រិតនៃជំងឺបេត ដែលវិទ្យាសាស្ត្រកំណែ បានចាប់ផ្តើម គាំទ្រដោយការស្រាវជ្រាវ ពីមានន័យជាមួយ ប្រហែល ១១៥ ក្នុងចំណោមប្រជាជន ១០០.០០០ នាក់ ក្នុងមួយឆ្នាំ ១៩៩៣ ។ អាចសន្និដ្ឋានបានថាប្រហែលជា ៥០ ភាគរយ នៃអ្នកជំងឺបេតដែលបានរាយការណ៍ ក្នុងការស្រាវជ្រាវនេះ ។ ឧទាហរណ៍ ការស្រាវជ្រាវនៅឆ្នាំ ( អាងស្រួល ) ទាំងនេះមាន ២៣០ វិទ្យាសាស្ត្រក្នុងប្រជាជន ១០០.០០០ នាក់ ។ នេះគឺជាឧទាហរណ៍ ដែលយើងអាចឃើញនៅក្នុងការអង្កេតកម្រិតនៃជំងឺបេត ។

ការអង្កេតឧបសគ្គកម្រិត នៅក្នុងតំបន់ភ្នំពេញ ១៩៨១ ១៩៨៩ ១៩៩៥ ដោយអង្គការសុខភាពពិភពលោក និងការអង្កេតនៅឆ្នាំ ១៩៨១ ដោយប្រជាជនកម្រិតខ្ពស់កំពុងប្រសើរឡើង បានបញ្ជាក់ឱ្យឃើញថា មួយផែនការប្រែប្រួលដោយក្រុម អង្គការសុខភាពពិភពលោក នៃឧបសគ្គកម្រិតនៃជំងឺបេត មានការផ្តល់ឱ្យ ។ តែទោះជាយ៉ាងណាក៏ដោយក៏អង្គការសុខភាពពិភពលោក ដែលមិនបានផ្តល់ការគាំទ្រ មេសេសេស្យូ ដែលមានលក្ខណៈលើស ប្រសិន ១០ ម.ម បានប្រាក់ចំណូល ៣៦៧ ភាគរយ ២១៨ ភាគរយ ១២៣ ភាគរយ និង ៦៧ ភាគរយ តាមលំដាប់ទ្រព្យ នៃការស្រាវ មិនយូរទាប ការគ្រប់គ្រងជាមួយ ៨១ ភាគរយ ប្រមាណ ២ ភាគរយ ក្នុង ឆ្នាំ ក្នុងតំបន់ លេខ ១៩៩៥ ។ ការអង្កេតឧបសគ្គកម្រិតនៃជំងឺបេត ៨ ម៉ែត្រ ដោយអង្គការសុខភាពពិភពលោកឆ្នាំ ១៩៩៥ ៣ ម៉ែត្រ ឆ្នាំ ១៩៨១ ១៩៨៩ ១៩៩៥ ។ សមាមាត្រ ក្នុងការស្រាវជ្រាវ លើស ប្រសិន ១០ ម.ម មានលំដាប់ ពី ៣២ ម ភាគរយ ១៤៧ ម ៥៥ ភាគរយ ។ ការគ្រប់គ្រង ធានាបានលើស ១៩៩៥ អាចប្រើប្រាស់ មេត្រូឌីផ្រេន ដែលបានប្រើប្រាស់ប្រចាំឆ្នាំ តាមការគ្រប់គ្រង ៨៣ ភាគរយ ប្រាក់ចំណូល ២១ ភាគរយ ក្នុង ១ ឆ្នាំ ។ ផ្អែកទៅលើការស្រាវជ្រាវឆ្នាំ ១៩៩៥ វិស័យ អង្កេត ឧបសគ្គកម្រិតនៃជំងឺបេត បានប្រើប្រាស់ ០.៨ ភាគរយ ក្នុងការស្រាវជ្រាវនេះ ។ គ្រោះថ្នាក់នៃការស្រាវជ្រាវនេះមានលក្ខណៈ ខ្ពស់ជាង ប្រមាណ ១០០.០០០ លើស ១០០ ករណីក្នុងមួយប្រជាជន ( មើលតារាង ១០ )

The results of the tuberculosis surveys, the tuberculosis prevalence surveys and the case notification data in Cambodia do not show the correlation which is usually observed. (see Figure 6)

### Prevalence of the disease

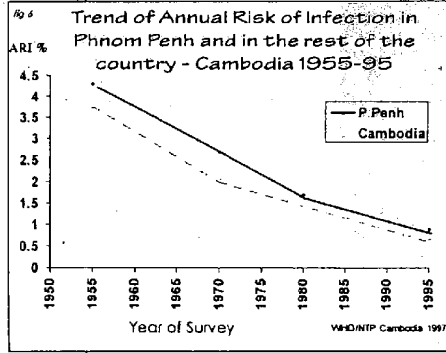
Tuberculosis prevalence surveys carried out between 1981 and 1989 found 393 smear-positive cases in a total study population of 86,377 subjects, i.e. a prevalence rate of 455 smear-positive cases per 100,000 population. A smaller survey in 2,583 subjects in 1995 found a prevalence of 426 smear-positive cases per 100,000 population. Assuming that the majority of these cases were never treated before, this prevalence level would indicate an incidence of about 215 new smear-positive cases per 100,000 population or 21,500 new smear-positive cases per year for the entire country. (see Table 10)

### Case detection

The case-detection rate of new smear-positive since the start of the new programme is about 115 per 100,000 population remaining on the average for the period 1993 till 1996. Assuming that 50% of cases are detected, the total incidence would be about 230 new smear-positive cases per 100,000 population. This is a figure which is in the range of the rates observed in the tuberculosis prevalence surveys.

### Prevalence of the infection

Tuberculin surveys were carried out in Phnom Penh by WHO in 1955, 1988 and 1995 and by the National Tuberculosis Institute in 1981. The results of these surveys are difficult to compare as the representativity of the study groups and the tuberculin units used are different. However, the percentages of non-8CG vaccinated children with skin indurations (thickening) of  $\geq 10$  mm declined from 36.7% to 18.4%, 12.3% and 6.7% in chronological order of the studies, i.e. a total decline of 81% or an average 2% per year during the period 1955 till 1995. Tuberculin surveys were further carried out outside Phnom Penh by WHO in 4 provinces in 1955, 3 provinces in 1988 and 19 provinces in 1995. The respective proportions children with skin indurations (thickening) of  $\geq 10$  mm were 33.2%, 14.7% and 5.5%. The total decline between 1955 and 1995 is comparable to the figure observed in Phnom Penh, i.e. 83% or on the average a decline of 2.1% per year. Based on the findings of the 1995 tuberculin surveys the annual risk of infection (ARI) is estimated to have been about 0.8% in recent years. This level of risk is equivalent with a total incidence of 40 smear-positive cases per 100,000 population or 4,000 new smear-positive cases for the entire country. (see Table 10)



# EPIDEMIOLOGY

# AND HIV/AIDS

TB and HIV form a deadly combination. When people are infected with both TB and HIV, TB is much more likely to become active because of the person's weakened immune system. WHO feels that TB is the leading cause of death among people who are HIV-positive, accounting for almost one third of fatalities. It is the leading opportunistic disease of AIDS patients.

A very important factor in the evolution of the tuberculosis problem in Cambodia is the spreading HIV epidemic. The first nationwide randomized HIV surveillance in tuberculosis patients was conducted by the AIDS programme with the collaboration of the TB programme in 1996. This study shows that 3.9% (95% confidence IC: 3-4.9%) of the 1826 smear positive tuberculosis cases tested were HIV positive in the country with a sex ratio male/female of 2.1 (5.2/2.5); in Phnom Penh it rises to 11.5% among 192 smear positive tuberculosis with a sex ratio male/female of 4.4 (16.7/3.8). (see Figure 7)

HIV sentinel surveillance results for 18 provinces in 1996 show that 1.73% of 3,929 pregnant women tested were HIV-positive. It is estimated that the HIV-seroprevalence in the adult population will increase from 1.5% in 1995 till 2.7% in 2000. The proportion of HIV-seropositive among new tuberculosis cases is estimated to increase from about 11% in 1996 till 26% in 2000. (see Table 11, Table 12 and Figure 8)



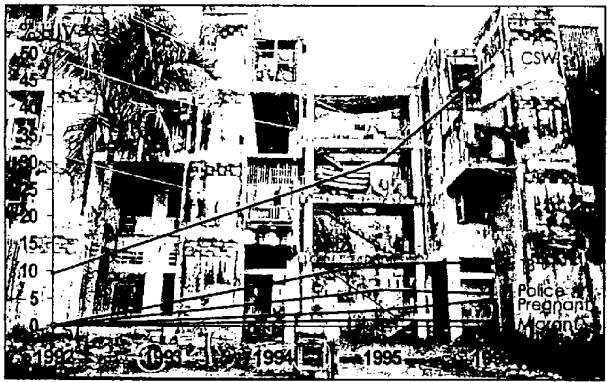
# ផែនការ

អនុ ៤៦ អនេស រួមគ្នាប្រភេទជំងឺមួយ ដែលអាចឈាមស្លាប់បានយ៉ាងលឿន ។ នៅពេលដែលអ្នកជំងឺមាន ឈាមរលេចដំបូងមានទុកលើកនេះ ជំងឺរបេងតែងត្រូវបានដាក់ឱ្យប្រាកដសារប្រព័ន្ធការពារ ក្នុងអំឡុងពេលនេះឡើយ ។ តាមការសិក្សាប្រកាសសុខភាពបំបាត់ឈាមធុងថា ជំងឺរបេង គឺជាមូលហេតុដែលនាំឱ្យអ្នកជំងឺច្រើនមេរោគ ឡើង ស្ថាប័ត្រូន គឺមានទឹក ១ ភាគ ៣ ។ ដោះដោយប្រើការស ឱ្យមួយដែលបានលេចឡើងជាងគេ ។

ការឆ្លងរបេងនៃមេរោគ អនេស គឺជាកត្តាយ៉ាងសំខាន់ក្នុងការវិវត្តនៃបញ្ហាជំងឺរបេងនៅកម្ពុជា ។ ការអង្កេត ជាប់ទាក់ទងនឹងមេរោគ ឡើង តាមរបៀបពិភពលោកស្តីពីជំងឺរបេងសម្រាប់ក្រុមគ្រូពេទ្យកម្ពុជានៅទូទាំងប្រទេស ក្នុងឆ្នាំ ១៩៩៦ ការសិក្សានេះបានបង្ហាញថា ក្នុងចំណោមអ្នកជំងឺរបេងវិទ្យុមានបេក្ខក្នុងតំបន់ទំនួរ ១៨៦៦ នាក់ មានទុកមេរោគ អនេស ៣.៩ ភាគរយ (95% confidence IC: 3-4.9%) ក្នុងសមាមាត្រភេទភេទ បុរស/ស្ត្រី ២.១ (៥.២ /២.៥) ។ នៅក្នុងគ្រូពេទ្យកម្ពុជានៅភ្នំពេញ អនេស កើតឡើង ១១.៥ ភាគរយ ក្នុងចំណោមអ្នកជំងឺរបេងវិទ្យុមានបេក្ខក្នុងតំបន់ទំនួរ ១៩២ នាក់ ក្នុងសមាមាត្រភេទ បុរស/ស្ត្រី ៤.៤ (១៦.៧ /៣.៦) ។ (មើលរូបភាព ៧ )

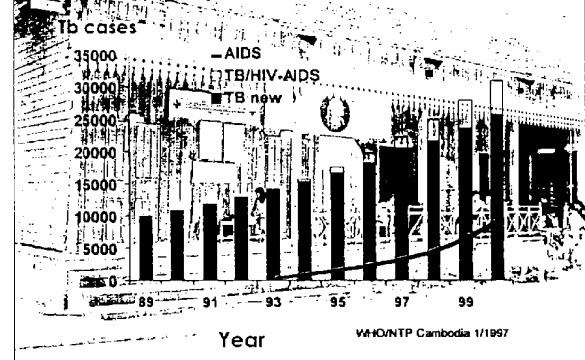
លទ្ធផលនៃការអង្កេតមេរោគឡើងជាប្រចាំនៅខេត្តទាំង ១៨ ក្នុងឆ្នាំ ១៩៩៦ បានបង្ហាញថាគ្រូពេទ្យមានចំនួន ៧៩២៩ នាក់ មានទុកមេរោគ ឡើង គិតជាភាគរយ ១.៧៣ ភាគរយ ។ តាមការចំណែកនៃបញ្ហាថា ក្នុងចំណោមប្រជាជនពេញវ័យចំនួនអ្នកទុកមេរោគនៅក្នុងសហគមន៍កើតឡើងពី ១.៥ ភាគរយ ក្នុងឆ្នាំ ១៩៩៥ ដល់ ២.៧ ភាគរយនៅឆ្នាំ ២០០០ ។ សមាមាត្រនៃអ្នកទុកមេរោគនៅក្នុងសហគមន៍ក្នុងចំណោមអ្នកជំងឺរបេងថ្មី ត្រូវបានគេចាត់ទុកថា កើតឡើងពី ១១ ភាគរយ ក្នុងឆ្នាំ ១៩៩៦ រហូតដល់ ២៦ ភាគរយក្នុងឆ្នាំ ២០០០ (មើលតារាង ១១.១២ និង រូបភាពទី៨) ។

Fig 7 HIV PREVALENCE AMONG RISK GROUPS PHNOM PENH - CAMBODIA 1992-1996



WHO/NTP Cambodia 1/1997

Fig. 8 Estimated TB and AIDS cases, Cambodia 1990-2000



WHO/NTP Cambodia 1/1997

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# raining and supervision

TB training courses have been carried out in all the provinces since 1994. Some 5 workshops were conducted in 1996 for 168 medical staff and 87 laboratory technicians from 7 provinces, as well as for police and military personnel. Some courses organized by provincial supervisors were given in 1996. Central and provincial staff participated in a number of training sessions, visits, and conferences abroad (Tokyo, Japan; Paris, France (IUATLD conference and lung disease course); Ho-Chi Minh, Vietnam; Manila, Philippines; Sydney Australia).

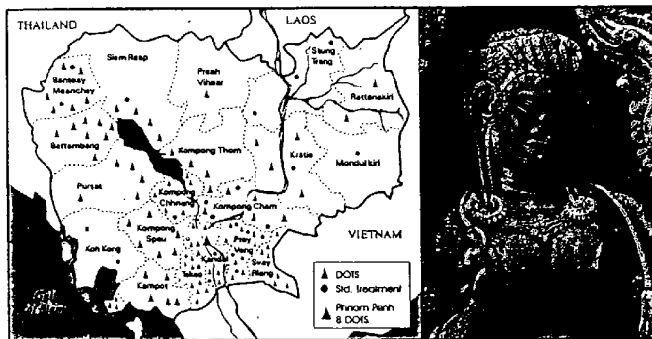
Supervisory visits guarantee the quality of the program's application, allowing weaknesses to be identified and corrected. Supervision was conducted by six central teams of one medical officer and one laboratory staff for 122 hospitals each of which are visited two to four times in 1996. The total number of supervision days by the central staff is 268.

At provincial level the provincial tuberculosis coordinator and the provincial laboratory staff visit all tuberculosis centers once monthly using of the available transport of the provincial health direction.

At district level, some district supervisors visited health centers monthly to quarterly. All provincial coordinators have been meeting at the national level to discuss the progress of implementation with CENAT three times in 1996. At the provincial level, most tuberculosis supervisors meet monthly at the provincial health office.

A WHO assessment was conducted in 1996. Their conclusions acknowledge and validate the quality of the results.

fig 4



# ការបណ្តុះបណ្តាល និងត្រួតពិនិត្យ

ការបណ្តុះបណ្តាលរបស់ក្រុមប្រឹក្សាជាតិកម្ពុជា ១៩៩៤ មកម្ល៉េះ ។ សិក្ខាសាលាចំនួន ៥ ប្រូវបានប្រារព្ធធ្វើឡើង ១៩៩៦ សំរាប់បុគ្គលិកផ្នែកវេជ្ជសាស្ត្រចំនួន ១៦៨ និងមន្ត្រីបច្ចេកទេសមន្ទីរ ពិសោធន៍ចំនួន ៨៧ ពិសេសចំនួន ៧ ដោយមានការរួមរួមពីបុគ្គលិកសុខាភិបាលជាធរមាន និង ឧបត្ថម្ភផ្សេងៗ ។ វគ្គបណ្តុះបណ្តាលតំបន់ប្រមូលផ្តុំកម្មវិធីផ្នែកផ្សេងៗដទៃទៀត ១៩៩៦ ។ ជាមួយគ្នានេះបុគ្គលិកទាំងឡាយទាំងឡាយបានចូលរួមចំណែក ទស្សនកិច្ច និង ការប្រជុំផ្សេងៗនៅក្រៅប្រទេសជាច្រើន ដូចជា : នៅតុលូ (ប្រទេសចប៉ុន) នៅហ្វីលីពីន (ប្រទេសតារ៉ាវ) ជួរហ្សូប៊ី និងបណ្តុះបណ្តាលនៅសហភាពរដ្ឋអាមេរិកជាតិប្រទេស និងម៉ិកស៊ិក និងម៉ិកស៊ិក នៅក្រុងហូធីម៉ិញ (វៀតណាម) នៅម៉ាឌីស (ហ្វ្រាំងស៊ែ) នៅលីធី (អូស្ត្រាលី) ។

ការបណ្តុះបណ្តាលប្រចាំខ្លួនរបស់ក្រុមប្រឹក្សាជាតិកម្ពុជា បានធានាបាននូវគុណភាពនៃការអនុវត្តតាមកម្មវិធីជាតិ ដោយទទួលបានការគាំទ្រ និងធ្វើការ កែច្នៃ ។ ក្នុងឆ្នាំ ១៩៩៦ ការបណ្តុះបណ្តាលរបស់ក្រុមប្រឹក្សាជាតិកម្ពុជា បានប្រើប្រាស់ ៦ ក្រុម ដែលក្នុង ១ ក្រុមមានប្រឹក្សាបច្ចេកទេស ២ ឬ មន្ត្រីបច្ចេកទេសមន្ទីរពិសោធន៍មួយនាក់ ។ ការបណ្តុះបណ្តាលបានចែកចេញជា ១២២ ដោយក្នុងនោះមានប្រឹក្សាបច្ចេកទេស ២ ឬ ៤ ដង ក្នុង ១ ឆ្នាំ ។ ចំនួនប្រឹក្សាបច្ចេកទេសរបស់ក្រុមប្រឹក្សាជាតិកម្ពុជា មាន ៦៦៤ វគ្គ ។

នៅតាមក្រុងផ្សេងៗ មន្ត្រីបច្ចេកទេសមន្ទីរពិសោធន៍ ថ្នាក់ខេត្ត និងបុគ្គលិកមន្ទីរពិសោធន៍ខេត្ត បានប្រើប្រាស់បណ្តាញបេស ១ ដង ក្នុង ១ ខែ ដោយប្រើប្រាស់មធ្យោបាយបេសមន្ត្រីសុខាភិបាល ជួរលើ ។ នៅតាមក្រុងផ្សេងៗ មន្ត្រីបច្ចេកទេសមន្ទីរពិសោធន៍ បានប្រើប្រាស់បណ្តាញបេសមន្ត្រីសុខាភិបាលរាល់ខែ ប្រយោជន៍ ។ មន្ត្រីបច្ចេកទេសមន្ទីរពិសោធន៍ បានប្រើប្រាស់បណ្តាញបេសនៅថ្នាក់ជាតិ ដើម្បីពិភាក្សាអំពីការ រៀបចំបណ្តាញបេស និងបញ្ជូនលទ្ធផលជាតិ ៣ ដង ក្នុងឆ្នាំ ១៩៩៦ ។ នៅថ្នាក់ខេត្តមន្ត្រីបច្ចេកទេស មន្ទីរពិសោធន៍មួយភាគធំ បានប្រើប្រាស់បណ្តាញ បេសមន្ត្រីសុខាភិបាលខេត្តជាប្រចាំខែ ។

ក្នុងឆ្នាំ ១៩៩៦ អង្គការសុខភាពពិភពលោក បានធ្វើការវាយតម្លៃខ្លះៗ លើកម្មវិធីកំចាត់ ជំងឺបេស ។ ក្នុងការវាយតម្លៃនេះ អង្គការសុខភាពពិភពលោក បានទទួលស្គាល់ និងអោយដឹងថា គ្រឹះមួយ លើគុណភាពនៃលទ្ធផល ដែលកម្មវិធីបេស លើមតិបានអនុវត្តបានប្រសើរ ។



# ប្រភពធនធាន

## បុគ្គលិក និងហិរញ្ញវត្ថុ

បុគ្គលិកដែលបំពេញនិក្ខេបបទជំងឺបេះ ត្រូវបានទទួលការពិនិត្យសុខភាពពីរដងក្នុងមួយឆ្នាំ ។ ក្នុងឆ្នាំ ១៩៩៧ បុគ្គលិកដែលធ្វើការនៅផ្នែកបេស និងបានទទួលឧបត្ថម្ភ និងប្រាក់បៀវត្សជាដើមមធ្យម ។ ការជំរុញនៃការលើកទឹកចិត្ត ដល់បុគ្គលិកបំពេញការងារនៅក្រុងស្រុក ១៥៧ ដល់ថ្នាក់កណ្តាលការងារចាំបាច់ត្រូវធ្វើផង ។

ថវិកាឆ្នាំបេសឆ្នាំ ១៩៩៦ មាន ៦,០៥ លានដុល្លារ ក្នុងនោះ ៣០ភាគរយ ត្រូវបានចំណាយសំរាប់ឱសថ និង៥០ ភាគរយ ទៀតសំរាប់មន្ត្រីអាហារ សរុបមាន ១៣១ ដុល្លារ សំរាប់ម្នាក់ទី ១ ឆ្នាំ ។ ដល់ការបែងចែកប្រចាំឆ្នាំ មាន ១៣ ដុល្លារ ។ ដោយហេតុនេះកម្មវិធីបេសជំងឺបេះបានប្រើប្រាស់ធនធានដែលមាននៅក្នុងប្រទេស ។

ការផ្តល់ធនធានធានាសុខភាព ដែលកម្មវិធីជាតិកំចាត់ជំងឺបេះ ពីលេខបច្ចុប្បន្នដល់ ឆ្នាំ ២០០០ ត្រូវបានផ្អែកទៅលើ ថវិកា ៨,០០០០០០ ដុល្លារ ដែលផ្តល់ធនធានសម្រាប់ការងារ ។ ការធ្វើអោយមានលទ្ធភាពក្នុងការប្រកប មតិក្នុងការប្រើប្រាស់ អាចធ្វើអោយកម្មវិធីបេស និងផែនការទៀតទៀតដែលទទួលបាននូវលទ្ធផលជោគជ័យបាន ។ ក្នុងការចាប់ផ្តើមសេចក្តីត្រូវការថវិកា ទោះបីតិចតួចក៏ដោយ ក៏អាចមានការជួយពីការប្រកួតប្រជែងការងាររបស់បណ្តា ទីសហគមន៍ក្នុងតំបន់ក្នុងប្រទេស ។ ដំណើរការនិងការប្រកួតប្រជែងការងាររបស់កម្មវិធី គឺពឹងពាក់ទៅលើថវិកាបេសប្រចាំ ឆ្នាំ (មើលតារាង ១៣) ។

## គ្រឹះស្ថាន បុគ្គលិក និងសេវាប្រើប្រាស់

ការផ្តល់ជំនួយសំរាប់កម្មវិធីជាតិជំងឺបេះ ត្រូវបានទទួលបានឆ្នាំ ២០០១ ដោយសារថវិកា ចំនួនរយលានដុល្លារអាមេរិក (k.f.w) និង ថវិកាខ្លីពីធនាគារពិភពលោក ដែលទិញធានាសុខភាព ២០ ឆ្នាំក្នុងមនុស្សម្នាក់ ធ្វើការរៀបចំផ្តល់ដំណើរការប្រចាំឆ្នាំ ដោយយោងទៅលើប្រាក់ចំណូល ១៩៩៦ កំណើនឱសថបេស បានតែងតាំងបុគ្គលិកប្រចាំឆ្នាំ និង ដោយគិតទាំងស្រុងចំប៉ុន ១ ដ្ឋានទៀតផង ។

ការផ្តល់ជំនួយប្រចាំឆ្នាំត្រូវបានទទួលបាន ក៏ប៉ុន្តែសន្តិសុខសុខភាពស្របច្បាប់ ដែលមានការយឺតយ៉ាវ ក្នុងការចាប់ផ្តើមប្រើប្រាស់ធនធានពិភពលោក ។ ឧបករណ៍មួយចំនួននៅខ្វះខាត ដែលទាក់ទង ជាមួយប្រើប្រាស់ប្រព័ន្ធស្រាវជ្រាវ និងការស្រាវជ្រាវ ដោយសារកំណើនឱសថបេស ។ នៅឆ្នាំបច្ចុប្បន្ននេះ នៅមានខ្វះខាតប្រចាំឆ្នាំ នៅ ឡើយ ។

ការតែងតាំងឱសថបេសនិងប្រព័ន្ធ រួមជាមួយឱសថសាស្ត្រឡើយទៀត គឺផ្តល់ឱសថកណ្តាលជាមួយ ប្រើប្រាស់ដោយមានការសហការគ្នាជាមួយថវិកាជាតិ ។ ក្នុងឆ្នាំ ១៩៩៦ បណ្តាញបេសទាំងអស់ បានទទួលបានថវិកាប្រចាំឆ្នាំ ។ ក្នុងបំណងបង្កើនការងារក្នុងការគ្រប់គ្រង និងការស្រាវជ្រាវ បេសដោយខ្លួនឯង នៃកម្មវិធីត្រូវបានផ្តល់ថវិកា ១៩៩៧ ដល់ការងារប្រចាំឆ្នាំ ទៅតាមគណនីបេសប្រើប្រាស់កម្មវិធីជាតិ ។

ស្របទៅតាមការប៉ាន់ស្មានថវិកាបេសឆ្នាំ ១៩៩៦ ដែលបានប៉ាន់ស្មានថវិកាជាតិមានសរុបមាន ២២៥.០០០ ដុល្លារ ក្នុងឆ្នាំ ១៩៩៦ ជាមួយនឹងកម្មវិធី ប្រើប្រាស់អាហារពិភពលោកបានផ្តល់ជំនួយ ១៥០០ ដោយ ៧០ ដោយ ប្រេង ៤ ដោយ និង ៤ ដោយ ដែលមានតំលៃសរុប ៧៧.០០០ ដុល្លារ ។ ចំនួននេះបានតែងតាំង ដោយសារការគ្រប់គ្រង ធានា ដល់ម្នាក់ទីបេសចំនួន ១០.០០០ ឆ្នាំ ក្នុងមន្ត្រីបេសទាំង ៨០ ក្នុងចំណោម ១២២ កម្មវិធីប្រើប្រាស់ប្រចាំឆ្នាំបេសទៀតផង ។ នៅឆ្នាំ ១៩៩៧ កម្មវិធីប្រើប្រាស់ អាហារពិភពលោកនិងបុគ្គ លិកប្រើប្រាស់ប្រើប្រាស់ម្នាក់ទីបេសទាំងអស់ទាំងប្រទេស ។ ក្រៅពីម្នាក់ទីបេស ម្នាក់ដែលទទួល បានទទួលប្រើប្រាស់ប្រើប្រាស់មតិមានការឧបត្ថម្ភប្រើប្រាស់នៅទៀតផង ។

# RESOURCES

## Personnel and finances

The Government is to give special attention to staff members who have contact with Tb patients. Indeed, such workers should receive in 1997 an increase in their risk bonuses and salaries. Staff promotion from periphery to central level needs to be reinforced.

The Tb programme cost \$ 2.05 million in 1996, of which 30 % was spent on drugs and another 50% on food, which amounts to \$ 131 per patient. The ratio of cost per year of life gained is \$ 13, which puts Tb near the top of the list in terms of cost effectiveness.

Financial autonomy of the tuberculosis programme between now and the year 2000 is based on the World Bank loan amounting \$ 8 million. Actual postponement of its releasing is weakening the programme and might affect the results. Prior to inception of the loan, minimal but vital quantitative financial needs must be still cared for with regard to funding training and supervisory activities. The quality and maintenance of current programme results depend upon such funds. (see Table 13)

## Medication, reagents and food

The supply of antituberculosis drugs is guaranteed until the year 2001 thanks to KfW (Kreditanstalt für Wiederaufbau) and the World Bank loan something that has not been seen in over 20 years. Despite the rapid implementation of short-term treatment in 1996, the need for antituberculosis drugs has been totally met this year, including buffer stock equivalent to a one-year supply.

Supplies of reagents has also been assured but the buffer stock is limited due to delay in the World Bank loan inception. Some materials as the microscope slides and the sputum containers need to be replaced because of their poor quality. Microscopes are still needed in some hospitals.

Distribution of tuberculosis drugs and reagent is managed by the Central Medical Store (CMS) on a fully integrated basis with other essential drugs and reagents. All the tuberculosis units have regularly received drugs and reagent in 1996. Decentralization of tuberculosis drugs management and orders should started in 1997 in some province based on calculation sheets provided by the tuberculosis programme. Regular mechanisms of needs updating for tuberculosis drugs is expected to improve with the implementation of the World Bank loan in 1997 as well as quality control for the items purchased.

Food for tuberculosis patients costs more than the tuberculosis drugs. In addition to the national budget for food estimated to be \$ 225,000 in 1996, the World Food Programme provided in 1996 1,500 tons of rice, 70 tons of fish, 45 tons of oil and 45 tons of biscuits, accounting for \$ 775,000. The aid was distributed by the Cambodian Red Cross to 10,000 Tb patients in 80 hospitals out of 122, as well as to the staff. The World Food Programme support is to be extended exclusively to all tuberculosis patient in all tuberculosis units from 1997. Apart leprosy cases the staff and other previous beneficiaries will not receive food in 1997.

Table 13

**COST AND FUNDING OF THE TB PROGRAMME 1994-2001 (in thousands US \$)**

|                         | 1994         | 1995         | 1996         | 97-2001       |
|-------------------------|--------------|--------------|--------------|---------------|
| Building                | 100          | 50           | 50           | 1,400         |
| Equipment               |              |              |              |               |
| Laboratory              | 0            | 80           | 100          | 400           |
| Transportation          | 40           | 80           | 40           | 250           |
| Office                  | 10           | 20           | 10           | 100           |
| Consumable              |              |              |              |               |
| Tb drugs                | 800          | 1,200        | 600          | 3,800         |
| Food                    | 800          | 1,000        | 1,000        | 2,500         |
| Laboratory              | 60           | 50           | 40           | 400           |
| Stationary printing     | 30           | 50           | 40           | 200           |
| Maintenance             | 40           | 50           | 40           | 300           |
| Services                |              |              |              |               |
| Training-research       | 90           | 80           | 50           | 1,500         |
| National staff          | 30           | 30           | 30           | 200           |
| Expatriate staff        | 50           | 50           | 50           | 300           |
| <b>TOTAL</b>            | <b>2,050</b> | <b>2,750</b> | <b>2,050</b> | <b>11,150</b> |
| Funding                 |              |              |              |               |
| State                   | 5%           | 11%          | 14%          | 70%           |
| State (World Bank loan) |              |              |              | 1%            |
| WFO                     | 25%          | 7%           | 7%           | 1%            |
| WFP                     | 36%          | 30%          | 38%          | 13%           |
| NGO                     | 14%          | 2%           | 2%           |               |
| Bilateral               |              |              |              |               |
| KfW (Germany)           |              | 43%          | 29%          | 17%           |
| ODA                     | 9%           |              |              |               |
| France                  | 9%           |              |              |               |
| Japan                   |              | 7%           | 10%          | 6%            |
| <b>TOTAL</b>            | <b>100%</b>  | <b>100%</b>  | <b>100%</b>  | <b>100%</b>   |





**យន្តការអភិវឌ្ឍន៍ :**

ប្រព័ន្ធអោលម្នាក់ដំបូងប្រាក់សេវា មិនអាចទៅក្រប្រាក់សេវាបានការផ្គត់ផ្គង់កម្មវិធីបែបនេះទេ ។ ការពិនិត្យ និងព្យាបាលដោយមិនមោឃៈម្នាក់ដំបូងប្រាក់សេវា នឹងការពារប្រព័ន្ធប្រយោជន៍ម្នាក់ដំបូង ហើយអាចរក្សាទុកវិធានការស្រាវជ្រាវកម្មវិធីបែបនេះ និងការព្យាបាលបានជាប់លាប់ដដែល ។ ទន្ទឹមនឹងពេលវេលាបន្តទៀតនានាក្នុងស្រុកក្រុងតំបន់ប្រទេសកម្ពុជាស្រាវជ្រាវទៅទៀត ផ្នែកដំបូងប្រាក់សេវាមាននិទ្ទាមការទាក់ទងការនេះជាអង្គការធម្មនុញ្ញជាមួយប្រទេសប្រទេស ហើយមិនក្រប្រាក់ចំណូលចូលឡើយ ។ ប្រាក់ទិញសេវាគ្រប់គ្រងការព្យាបាលនិងការព្យាបាលដោយមានទឹកស្រាវជ្រាវដំបូងប្រាក់សេវាឡើយ ២០០១ ប៉ុន្តែវិធានការទាំងនេះ និងជាប្រភេទនេះ គ្រឹះការវិនិយោគវិនិយោគនិងទាន់ពេលវេលា ។

**Mechanism of funding**

User charges will not ensure adequate and secure financing for Tb. Financial exemptions for Tb patients will protect Tb patients so that case-finding and case-holding levels are maintained. When user fees constitute an important source of revenue to local health facilities, there may be a tendency to regard service such as Tb that does not generate income, as a low priority. The World Bank loan will secure the funding of Tb till year 2001 but its rapid implementation is an urgent need.

**ជំនួយសេវាសុខាភិបាលសុខាភិបាល :**

មានការយកចិត្តទុកដាក់កាន់តែច្រើនឡើងៗ អំពីសេវាបម្រើសុខភាពរបស់កិច្ចសន្យាជាជាងរបៀបប្រកបរបរធម្មតា និងបើកចោលបច្ចេកវិទ្យាប្រកបរបរ ។ កិច្ចសន្យាស្តីពីសេវាសុខភាពសម្រាប់ប្រជាជនក្នុងតំបន់ខ្លះៗ គឺ ឌុកស៊ី អាចនឹងលើកស្ទួយការព្យាបាលក្នុងកម្ពុជា ។ ទំនាក់ទំនងជាមួយផ្នែកសេវាសុខភាព និងចាប់ផ្តើមធ្វើជាមួយស្ថាប័ននៅក្នុងឆ្នាំ ១៩៩៧ នេះ ។ ជំនួយសេវាសុខភាពសម្រាប់ប្រជាជន និងផ្នែកសុខាភិបាល អាចនឹងប្រើប្រាស់ឡើយ ដើម្បីភ្ជាប់កិច្ចសន្យាប្រកបរបរសេវាសុខភាពសុខាភិបាលសាធារណៈ ។ សេវាសុខភាពសម្រាប់ប្រជាជននឹងត្រូវការបញ្ជូនឱសថដងប្រកបរបរក្នុងតំបន់ខ្លះៗ តែការព្យាបាលប្រើប្រាស់សេវាសុខាភិបាលសាធារណៈ និងស្រៀមដើម្បីប្រយុទ្ធនឹងកង្វះឱសថស្ថានសាធារណៈ ២ កន្លែង (គឺបណ្ណាល័យជាតិសុខាភិបាលដំបូង និងស្រុកមានជ័យ) អាចនឹងត្រូវលើកជាសំណើទៅគ្រូពេទ្យផ្នែកធានា និងដើម្បីពិនិត្យប្រកបរបរសេវាសុខភាពសាធារណៈ ។ សមាគមគ្រូពេទ្យកម្ពុជា និងគ្លីនិកធានាបាននូវការទទួលបានសេវាសុខភាពសម្រាប់ប្រជាជន ។

**New approaches to health service**

There is increased interest in contractual rather than in bureaucratic control of health services, in term of administrative regulation. Contracting out certain key elements of the DOTs can be studied in Cambodia. Bridges with the private sector will start on a pilot basis in 1997. Tb specialist doctors with both public and private practice might be prepared to enter into a contract or franchising agreement with the public sector. Diagnosis service, free Tb drugs and home care delivery services during the initial phase carried out by the public sector will be proposed against epidemiologic data. A home care delivery DOTs, which started in 2 public hospitals of Phnom Penh (CENAT and Mean Chey) in 1996 could also be proposed to private practitioners upon agreement. Cambodian Medical Association and some main private clinics could also benefit of educational packages from the Tb programme.

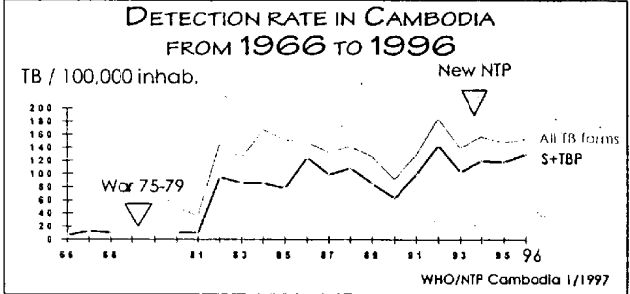


fig 2

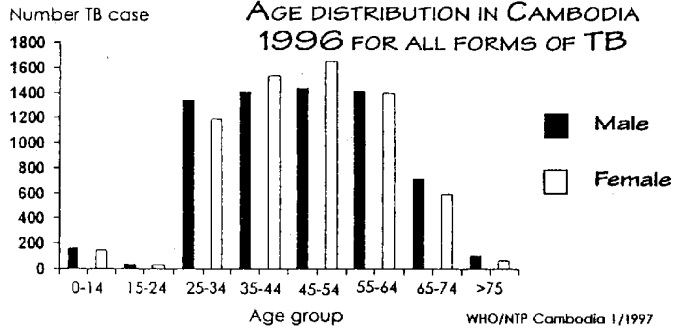


fig 3

**COHORT ANALYSIS OF 3661 TB CASES. TREATMENT CATEGORY ENROLLED IN 1994 AND FIRST THREE QUARTERS OF 1995**

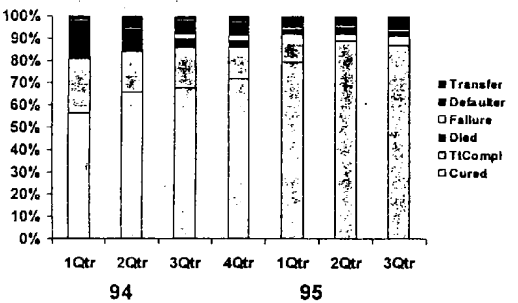


fig 5

TABLES

Table 1 TB ACTIVITY IN CAMBODIA FROM 1966 TO 1996

| YEAR    | ESTIMATED POPULATION IN MILLION | CASE DETECTION |            |             |         | TOTAL TB cases | DETECTION RATE PER 100,000 HABITANTS |           |
|---------|---------------------------------|----------------|------------|-------------|---------|----------------|--------------------------------------|-----------|
|         |                                 | Smear+ TBP     | Smear- TBP | Extra Pulm. | Relapse |                | S+ TBP                               | All forms |
| 1966    | 6.4                             | 457            |            |             |         | 1,011          | 7                                    | 16        |
| 1967    | 6.6                             | 837            |            |             |         | 2,103          | 13                                   | 32        |
| 1968    | 6.8                             | 738            |            |             |         | 2,454          | 11                                   | 36        |
| 1975-79 | WAR                             |                |            |             |         |                |                                      |           |
| 1980    | 5.4                             | 571            |            |             |         | 2,567          | 11                                   | 48        |
| 1981    | 5.65                            | 630            |            |             |         | 1,980          | 11                                   | 35        |
| 1982    | 5.9                             | 5,579          | 2,663      | 233         |         | 8,475          | 95                                   | 144       |
| 1983    | 6.15                            | 5,316          | 1,823      | 433         |         | 7,572          | 86                                   | 123       |
| 1984    | 6.4                             | 5,507          | 3,160      | 2,007       |         | 10,674         | 86                                   | 167       |
| 1985    | 6.7                             | 5,235          | 3,891      | 1,018       |         | 10,145         | 78                                   | 151       |
| 1986    | 7.0                             | 8,715          | 1,295      | 271         |         | 10,281         | 125                                  | 147       |
| 1987    | 7.3                             | 7,173          | 1,406      | 1,027       |         | 9,606          | 98                                   | 132       |
| 1988    | 7.6                             | 8,246          | 1,714      | 731         |         | 10,691         | 109                                  | 141       |
| 1989    | 7.9                             | 6,740          | 2,251      | 965         |         | 9,956          | 85                                   | 126       |
| 1990    | 8.2                             | 5,132          | 1,630      | 672         |         | 7,434          | 63                                   | 91        |
| 1991    | 8.5                             | 8,507          | 990        | 1,406       |         | 10,903         | 100                                  | 128       |
| 1992    | 8.8                             | 12,685         | 2,491      | 972         |         | 16,148         | 144                                  | 184       |
| 1993    | 9.25                            | 9,560          | 2,417      | 902         |         | 12,879         | 103                                  | 139       |
| 1994    | 9.7                             | 11,058         | 2,195      | 1,319       | 540     | 15,112         | 120                                  | 156       |
| 1995    | 9.95                            | 11,101         | 1,465      | 1,428       | 605     | 14,599         | 118                                  | 147       |
| 1996    | 10.2                            | 12,163         | 740        | 1,477       | 806     | 14,986         | 130                                  | 153       |

Table 2 TB activity in Phnom Penh 1993-1996

| YEAR | Smear + S+ TBP |     | Smear - S- TBP |    | Extra Pulm. | Total TB cases | Number TB units |     |       |    |
|------|----------------|-----|----------------|----|-------------|----------------|-----------------|-----|-------|----|
|      | Relapse        | %   | Relapse        | %  |             |                |                 |     |       |    |
| 1993 | 1,411          | 54% | 21             | 1% | 959         | 37%            | 234             | 9%  | 2,625 | 1  |
| 1994 | 895            | 48% | 34             | 2% | 706         | 38%            | 222             | 12% | 1,857 | 5* |
| 1995 | 739            | 57% | 50             | 4% | 321         | 25%            | 184             | 14% | 1,294 | 8* |
| 1996 | 875            | 68% | 47             | 4% | 195         | 14%            | 202             | 14% | 1,358 | 9* |

\* no data from central and 2 hospitals (Cambec and Kantea Bopha hospitals)

|       | S+ TBP |      | S- TBP |     | TEP |     | TOTAL |      |
|-------|--------|------|--------|-----|-----|-----|-------|------|
|       | M      | F    | M      | F   | M   | F   | M     | F    |
| 0-14  | 39     | 28   | 29     | 25  | 92  | 95  | 160   | 148  |
| 15-24 | 18     | 9    | 3      | 2   | 10  | 16  | 31    | 27   |
| 25-34 | 1196   | 1004 | 52     | 46  | 136 | 137 | 1344  | 1169 |
| 35-44 | 1238   | 1340 | 65     | 62  | 102 | 136 | 1406  | 1540 |
| 45-54 | 1290   | 1501 | 65     | 56  | 81  | 96  | 1439  | 1653 |
| 55-64 | 1275   | 1260 | 60     | 64  | 80  | 76  | 1415  | 1400 |
| 65-74 | 648    | 565  | 33     | 37  | 37  | 48  | 718   | 590  |
| +75   | 89     | 47   | 0      | 2   | 7   | 8   | 105   | 67   |
| Total | 5753   | 5694 | 317    | 296 | 548 | 614 | 6618  | 6614 |

AGE DISTRIBUTION AND SEX RATIO

Table 3

|       | Sex-ratio Gen. pop. M/F | All forms of TB |      |      | DETECTION RATE (PER 100,000 INHAB.) All forms of TB |       |       |
|-------|-------------------------|-----------------|------|------|---|-------|-------|
|       |                         | 1996            | 1995 | 1994 | M   | F     | Tot   |
| 0-14  | 103                     | 1.09            | 1.31 | 1.10 | 12.7  | 11.7  | 12.2  |
| 15-24 | 102                     | 1.19            | 1.08 | 1.13 | 2.9   | 2.5   | 2.7   |
| 25-34 | 0.96                    | 1.05            | 1.04 | 1.04 | 202.1   | 156.2 | 177.7 |
| 35-44 | 0.75                    | 0.80            | 0.80 | 0.80 | 288.7   | 255.8 | 270.5 |
| 45-54 | 0.71                    | 0.94            | 0.86 | 0.90 | 507.9   | 434.2 | 465.6 |
| 55-64 | 0.63                    | 1.03            | 0.97 | 0.97 | 665.9   | 494.1 | 578.1 |
| 65-74 | 0.56                    | 1.20            | 1.04 | 1.00 | 506.9   | 302.9 | 388.8 |
| +75   | 0.80                    | 2.00            | 1.54 | 1.71 | 131.8   | 53    | 89.2  |
| Total | 0.93                    | 0.99            | 0.94 | 0.96 | 1577  | 1416  | 134   |

| SEX-RATIO BY TB FORM | 1996 M/F | 1995 M/F | 1994 M/F |
|----------------------|----------|----------|----------|
| S+ TBP               | 1.01     | 0.96     | 0.99     |
| S- TBP               | 1.04     | 0.90     | 0.86     |
| TEP                  | 0.89     | 0.87     | 0.98     |

Table 4 TB laboratory activity in Cambodia 1993-1996

| YEAR | Total BK slides | % slide rates                     |                                       |                                      |
|------|-----------------|-----------------------------------|---------------------------------------|--------------------------------------|
|      |                 | First slide 1 (slide 1 / slide 1) | Second slide rate (slide 2 / slide 1) | Third slide rate (slide 3 / slide 1) |
| 1993 | 64,878          | no data                           | no data                               | no data                              |
| 1994 | 82,328          | 30%                               | 77%                                   | 64%                                  |
| 1995 | 121,235         | 29%                               | 87%                                   | 81%                                  |
| 1996 | 141,820         | 31%                               | 94%                                   | 92%                                  |

Quality assurance in Cambodia, 1993-1996

Table 5

| YEAR | No of slides cross-checked | 1 slides cross-checked | Sensitivity | Specificity | Agreement rate | False Positive rate | False Negative rate |
|------|----------------------------|------------------------|-------------|-------------|----------------|---------------------|---------------------|
|      |                            |                        |             |             |                |                     |                     |
| 1993 | 0                          | 0%                     |             |             |                |                     |                     |
| 1994 | 1,248                      | 15%                    | 99%         | 95%         |                |                     |                     |
| 1995 | 2,590                      | 21%                    | 98%         | 94%         |                |                     |                     |
| 1996 | 5,209                      | 37%                    | 97%         | 95%         | 96%            | 25%                 | 14%                 |

DOTS implementation and decentralization from 1966 to 1996

Table 6

| YEAR | TB UNITS with DOTS (on 122 units) num. (% tot) | Decentralization of case management % of total TB cases |          |
|------|--|---|----------|
|      |  | Province  | District |
| 1993 | 0  | 5%  | 4%       |
| 1994 | 23 (23%)                                       | 45%   | 5%       |
| 1995 | 67 (57%)                                       | 34%   | 6%       |
| 1996 | 110 (80%)                                      | 30%   | 7%       |

Table 7 IMPACT OF THE WORLD FOOD PROGRAMME SUPPORT CAMBODIA.

| Year | No. of Towns |        | CASE DETECTION (PER 100,000 h) |        |      | SUCCESS RATE (CAT I) |        |         |
|------|--------------|--------|--------------------------------|--------|------|----------------------|--------|---------|
|      | with WFP     | no WFP | with WFP                       | no WFP | r    | with WFP             | no WFP | r       |
| 1994 | 54           | 95     | 176                            | 126    | <10' | 80%                  | 69%    | 15(0.8) |
| 1995 | 72           | 46     | 168                            | 135    | <10' | 90%                  | 93%    | 15(0.3) |
| 1996 | 56           | 46     | 172                            | 150    | <10  |                      |        |         |
| 1997 | 72           |        |                                |        |      |                      |        |         |

Table 8 RESULTS OF COHORT ANALYSIS ENROLLED DURING 1994 AND FIRST THREE QUARTERS OF 95 CAMBODIA.

| CAT 1          | CASE  | CURED % | TWOVER % | DIED % | FAILURE % | DEFAULT % | TRANSFER % | TOTAL |      |        |     |    |    |       |
|----------------|-------|---------|----------|--------|-----------|-----------|------------|-------|------|--------|-----|----|----|-------|
|                |       |         |          |        |           |           |            |       | 1994 | 3/4 95 |     |    |    |       |
| 1st Quarter 94 | 91    | 51      | 56%      | 22     | 24%       | 1         | 1%         | 0     | 0%   | 15     | 16% | 2  | 2% | 91    |
| 2nd Quarter 94 | 224   | 147     | 66%      | 40     | 18%       | 7         | 3%         | 1     | 0%   | 16     | 7%  | 13 | 6% | 224   |
| 3rd Quarter 94 | 256   | 507     | 57%      | 126    | 18%       | 31        | 4%         | 17    | 2%   | 49     | 6%  | 16 | 2% | 256   |
| 4th Quarter 94 | 759   | 950     | 72%      | 103    | 14%       | 22        | 3%         | 15    | 2%   | 44     | 6%  | 25 | 3% | 759   |
| TOTAL 1994     | 1830  | 1255    | 69%      | 301    | 16%       | 61        | 3%         | 33    | 2%   | 124    | 7%  | 56 | 3% | 1830  |
| 1st Quarter 95 | 1157  | 929     | 80%      | 151    | 13%       | 25        | 2%         | 9     | 1%   | 42     | 4%  | 10 | 1% | 1157  |
| 2nd Quarter 95 | 1177  | 1044    | 89%      | 38     | 3%        | 30        | 3%         | 10    | 1%   | 39     | 3%  | 16 | 1% | 1177  |
| 3rd Quarter 95 | 1327  | 1164    | 88%      | 47     | 4%        | 23        | 2%         | 17    | 1%   | 62     | 5%  | 16 | 1% | 1329  |
| 3/4 95         | 3,661 | 3,128   | 85%      | 236    | 6%        | 78        | 2%         | 36    | 1%   | 143    | 4%  | 42 | 1% | 3,663 |
| CAT 2 Kelapoe  |       |         |          |        |           |           |            |       |      |        |     |    |    |       |
| 1994           | 123   | 75      | 61%      | 32     | 26%       | 6         | 5%         | 6     | 5%   | 4      | 3%  | 0  | 0% | 123   |
| 3/4 95         | 281   | 211     | 75%      | 36     | 13%       | 14        | 5%         | 8     | 3%   | 7      | 2%  | 5  | 2% | 281   |
| CAT 2 Other    |       |         |          |        |           |           |            |       |      |        |     |    |    |       |
| 1994           | 100   | 38      | 38%      | 36     | 36%       | 11        | 11%        | 6     | 6%   | 4      | 4%  | 5  | 5% | 100   |
| 3/4 95         | 162   | 53      | 33%      | 77     | 48%       | 9         | 6%         | 8     | 5%   | 5      | 3%  | 13 | 8% | 162   |
| CAT 3          |       |         |          |        |           |           |            |       |      |        |     |    |    |       |
| 1994           | 528   |         |          | 445    | 84%       | 39        | 7%         | 0     | 0%   | 23     | 4%  | 21 | 4% | 528   |
| 3/4 95         | 1,033 |         |          | 911    | 88%       | 40        | 4%         | 0     | 0%   | 48     | 5%  | 35 | 3% | 1,034 |

Table 9 RESULTS OF TREATMENT FROM 1981 TO 1993

| Year | % Declared cured without cohort analysis (before 1994) |
|------|--|
| 1981 | 43.5%  |
| 1982 | 20.2%  |
| 1983 | 20.8%  |
| 1984 | 25.2%  |
| 1985 | 35.0%  |
| 1986 | 45.4%  |
| 1987 | 63.0%  |
| 1988 | 56.0%  |
| 1989 | 47.3%  |
| 1990 | 46.5%  |
| 1991 | 30.7%  |
| 1992 | 45.1%  |
| 1993 | 44.7%  |

Table 10 HIV SEROPREVALENCE SURVEILLANCE IN CAMBODIA 1992-1996.

(from AIDS programme with the collaboration of Tb programme for Tb surveillance)

| Year     | CSWs HIV+  |      | Police HIV+ |     | Programs HIV+ |       | International Office for Migration, IOM HIV+ |       | TB Searched HIV+ |      |
|----------|------------|------|-------------|-----|---------------|-------|--|-------|------------------|------|
|          | No. tested | %    | No. tested  | %   | No. tested    | %     | No. tested                                   | %     | No. tested       | %    |
| 1992     | 951        | 282  | 0/0%        | 240 | 0/0%          | 155   |  |       | 0/0%             | 103  |
| 1994     |            |      |             |     |               |       | 79%  | 14    |                  |      |
| 1995     | 3051       | 128  | 66%         | 304 | 3.0%          | 160   | 11.3%  | 80    |                  |      |
| 1996     | 481        | 220  | 6%          | 258 | 5%            | 268   |  |       | 11.5%            | 192  |
| COUNTRY* |            |      |             |     |               |       |  |       |                  |      |
| 1992     |            |      |             |     |               |       | 0.66%  | 606   |                  |      |
| 1994     | 3941       | 215  |             |     |               |       | 0.7%   | 2,159 |                  |      |
| 1995     | 3791       | 1007 | 8.1%        | 284 | 2.64%         | 670   | 12%  | 2,237 |                  |      |
| 1996     | 4091       | 1068 | 5.3%        | 175 | 1.7%          | 3,329 | 10%  | 2,209 | 3.9%             | 1026 |

\* surveillance performed among 9 Provinces in 1992 and 10 Provinces in 1996. Randomized sample for TB surveillance in 1996

Table 11 TUBERCULIN AND PREVALENCE SURVEYS IN CAMBODIA 1955-1995

| TUBERCULIN SURVEYS | YEAR         | PPD TEST RT23 | BCG COVERAGE % | TESTED AGE (NON VACCINATED) | CHILDREN SIZE | POSITIVE NUMBER | ARI   | ARI annual DECREASE % 1955-1995 |
|--------------------|--------------|---------------|----------------|-----------------------------|---------------|-----------------|-------|---------------------------------|
| Phnom Penh         |              |               |                |                             |               |                 |       | 2.09%                           |
| WHIC               | 1955         | 5TU           |                | 499                         | 8-12 yrs >9mm | 183             | 36.7% | 4.3%                            |
| WHIC/JINKEF        | 1958         | 1TU           | 16.7%          | 461                         | 5-9 yrs >9mm  | 25              | 10.4% | 2.7%                            |
| INAT               | 1961         | 2TU           |                | 2,256                       | 5-9 yrs >9mm  | 277             | 12.3% | 1.7%                            |
| WHC                | 1995         | 1TU           | 25.6%          | 1,066                       | 5-9 yrs >9mm  | 71              | 6.7%  | 0.9%                            |
| WHC                | 1995         | 2TU           |                | comparing                   | 5-9 yrs       |                 |       |                                 |
| Provinces          |              |               |                |                             |               |                 |       | 2.1%                            |
| 4 Provinces (WHC)  | 1955         | 5TU           | 9.8%           | 2,283                       | 8-12 yrs >9mm | 757             | 23.2% | 3.8%                            |
| 3 provinces (WHIC) | 1968         | 1TU           |                | 1,001                       | 5-9 yrs >9mm  | 147             | 14.7% | 2.1%                            |
| 19 provinces (WHC) | 1995         | 1TU           | 49.3%          | 1,795                       | 5-9 yrs >9mm  | 98              | 5.5%  | 0.7%                            |
| Country (WHC)      | 1995         | 1TU           | 61.3%          | 1,755                       | 5-9 yrs >9mm  | 97              | 5.5%  | 0.8%                            |
| PREVALENCE STUDY   | YEAR STUDIED | POPULATION    | TB cases       | PREVALENCE                  |               |                 |       |                                 |
| Phnom Penh         | 1981-84      | 12,941        | 26             | 206                         |               |                 |       |                                 |
| Kandal             | 1981-83      | 13,569        | 35             | 258                         |               |                 |       |                                 |
| Prey Veng          | 1982-88      | 8,109         | 42             | 518                         |               |                 |       |                                 |
| Takeo              | 1983-89      | 23,374        | 140            | 593                         |               |                 |       |                                 |
| Ka Chhlong         | 1984-89      | 9,625         | 38             | 573                         |               |                 |       |                                 |
| Svay Rieng         | 1985         | 4,578         | 34             | 473                         |               |                 |       |                                 |
| Kg Spea            | 1989         | 5,524         | 16             | 301                         |               |                 |       |                                 |
| Kg Chhn            | 1989         | 5,540         | 20             | 364                         |               |                 |       |                                 |
| Siem Reap          | 1989         | 6,404         | 42             | 656                         |               |                 |       |                                 |
| TOTAL              | 1981-89      | 86,377        | 393            | 455                         |               |                 |       |                                 |
| IOM (country)      | 1995         | 2,583         | 11             | 426                         |               |                 |       |                                 |

Table 12 ESTIMATED ANNUAL ADULT AIDS AND TUBERCULOSIS CASES IN CAMBODIA 1990-2000

(from J.Chin AIDSCAP/Family Health International)

| YEAR | HIV inc. | HIV prev | HIV new | AIDS new | TB inc | TB new Total | TB/HIV-AIDS | 1 TB excess |
|------|----------|----------|---------|----------|--------|--------------|-------------|-------------|
| 1999 | 0.00%    | 0.00%    | 0       | 0        | 0.1%   | 10,000       | 0           | 0%          |
| 1990 | 0.00%    | 0.00%    | 145     | 0        | 0.1%   | 10,900       | 0           | 0%          |
| 1991 | 0.1%     | 0.1%     | 4,876   | 1        | 0.1%   | 11,881       | 1           | 0%          |
| 1992 | 0.23%    | 0.24%    | 10,754  | 28       | 0.1%   | 12,950       | 15          | 0%          |
| 1993 | 0.35%    | 0.68%    | 16,587  | 184      | 0.1%   | 14,116       | 118         | 1%          |
| 1994 | 0.44%    | 1.08%    | 21,146  | 653      | 0.1%   | 15,386       | 384         | 2%          |
| 1995 | 0.48%    | 1.50%    | 23,235  | 1,467    | 0.1%   | 16,771       | 882         | 5%          |
| 1996 | 0.48%    | 1.89%    | 24,689  | 2,639    | 0.1%   | 18,280       | 1,572       | 9%          |
| 1997 | 0.45%    | 2.21%    | 24,540  | 4,087    | 0.1%   | 19,926       | 2,586       | 12%         |
| 1998 | 0.41%    | 2.45%    | 22,329  | 5,701    | 0.1%   | 21,719       | 3,323       | 15%         |
| 1999 | 0.36%    | 2.61%    | 19,978  | 7,369    | 0.1%   | 23,674       | 4,294       | 18%         |
| 2000 | 0.30%    | 2.68%    | 17,546  | 8,991    | 0.1%   | 25,804       | 5,203       | 20%         |