

ព្រះរាជាណាចក្រកម្ពុជា
ជាតិ សាសនា ព្រះមហាក្សត្រ



KINGDOM OF CAMBODIA
NATION RELIGION KING

ក្រសួងសុខាភិបាល
Ministry of Health



របាយការណ៍ស្តីពីជំងឺរបេងឆ្នាំ ២០០៩

TUBERCULOSIS REPORT 2009

រៀបរៀងដោយ កម្មវិធីជាតិកំចាត់រោគរបេង



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I. Introduction

Cambodia is one of the 22 countries in the world with a high burden of tuberculosis. During the last 10 years, cases of TB notified under the National TB Control Program (NTP) has increased more than two folds, up to 40,199 cases of all forms in 2009. The impact of HIV/AIDS on TB in the coming years will be of great concern for the country with high burden of HIV / AIDS.

TB control has been given high priority by the Ministry of Health. Encouraged by the strong commitment of the Royal Government of the Kingdom of Cambodia with the Prime Minister, HE Samdech Hun Sen, as the Honorable Chairman of the National Tuberculosis Committee, it is hoped that a combined effort focused on socio-economic development and poverty alleviation will benefit the vast majority of the population affected by tuberculosis.

In line with the Global Plan and strategy of TB control (2006-2015), the National Tuberculosis Control Program (NTP) aims at achieving the objectives set in the National Strategic plan 2006-2010. The medium-term objectives are:

- to expand the DOTS strategy to cover all health centers.
- to attain the case detection rate of over 70%
- to maintain the high cure rate of more than 85%.

The longer term aims are to reduce the prevalence and death of TB to contribute to attaining MDG goals by 2015.

In order for the NTP to meet its objectives, participation from all parties, including health workers, concerned institutions, partners, local authorities and communities is critically required.

DOTS expansion to Health centers is believed to help improve the accessibility of the population to TB services which are provided free of charge. It has helped to attain the case detection rate of 62% in 2009. It also contributed to maintaining the cure rate of over 85%, meeting the target.

At the same time, the NTP will focus on improving the management structure, service provision, health information system (HIS), information, education and communication (IEC), research, investment, drugs, financing and partnership with other NGOs, IOs. Staff have been trained locally and also sent abroad for training in various fields in order to upgrade their skills to provide quality health care for the patients.

In 2009, with strong support from the Royal Government of Cambodia as well as the Ministry of Health, impressive achievement were obtained in the field of TB Control in Cambodia. These achievements are due to the efforts made by all stakeholders within and outside the government. This document provides the summarized activities in TB control conducted in the year 2009.

II. Epidemiology of Tuberculosis

1. TB in the world :

Currently nearly one-third of the global population, i.e. two billion people, is infected with *Mycobacterium tuberculosis* and at risk of developing the disease. Every year, nearly Nine million people develop active tuberculosis (TB), and nearly two million die.¹

More people are dying of TB today than ever before. TB is the biggest curable infectious killer of young people and adults in the world today².

More than 90 % of global TB cases and deaths occur in the developing world, where 75 % of cases are in the most economically productive age group (15-54 years). In general, an adult with TB loses on average three to four months of work time. This results in the loss of 20-30 % of annual household income and, if the patient dies of TB, an average of 15 years of income loss.

In addition to the devastating economic costs, TB imposes indirect negative consequences such as children leave school because of their parents ‘

¹ WHO, Guidelines for National Tuberculosis Programmes

² Fight AIDS, Fight TB, Fight Now: WHO

tuberculosis, and women are abandoned by their families as a result of their disease.

TB/HIV co-infection significantly increases the risk of developing TB. Hence the number of TB cases will be increased particularly for Countries with a high prevalence of both diseases. Multi-drug resistance, which is caused by poorly managed TB treatment, is a growing problem of serious concern in many countries around the world.

The main reasons for the increasing burden of TB globally are:

- poverty and the widening gap between rich and poor
- neglect of controlling the disease (inadequate case detection, diagnosis and treatment)
- collapse of the health infrastructure in countries experiencing severe economic crisis or civil unrest
- impact of the HIV pandemic
- increasing population

2. TB in Cambodia :

Cambodia has been classified by the World Health Organization (WHO) as one of the 22 high burden countries with tuberculosis in the world. In 1997, the WHO experts estimated that 64 % of Cambodian population were infected with Mycobacterium tuberculosis. In 2007, the estimated incidence rate of new smear positive pulmonary tuberculosis was 219/100,000 population and incidence rate of all forms of tuberculosis was 495/100,000 population and the death rate of tuberculosis was 89/100,000 population.

Before 1994, the result of case detection and treatment of tuberculosis were not satisfactory. For instance in 1993, the case detection rate of smear positive pulmonary tuberculosis nationwide was only about 44 % and the cure rate was 69%. So, the priority problem needed to be solved at that time was changing the treatment strategy by applying the Short Course Chemotherapy

with Direct Observation, called “ DOTS “ ; and then, the solution to the problem of low case detection.

Since 1994, the application of method for treating tuberculosis through Short Course Chemotherapy with Direct Observation (DOT), has enabled the NTP to achieve the cure rate result of more than 85 %.

3. TB/HIV:

Many people infected with HIV in developing countries developed TB as the first manifestation of AIDS. The two diseases represent a deadly combination, since they are more destructive each together than either disease alone.

- TB is harder to diagnose in HIV/AIDS patient.
- TB develops faster in HIV-infected people
- TB in HIV-positive people is almost certain to be fatal if undiagnosed or left untreated
- TB occurs earlier in the course of HIV infection than many other opportunistic infections.

Worldwide, 14 million people are co-infected with TB and HIV. 70 % of them are concentrated in Africa³.

TB is the leading killer of AIDS patients. Up to 50 % of people with HIV or AIDS develop TB.

TB can be successfully treated even if someone is HIV-infected. Treatment of TB can prolong and improve the quality of life for HIV-positive people but cannot alone prevent people from dying of AIDS.

Cambodia is also among the countries with high burden of TB and HIV/AIDS. The surveys showed an initial increase of HIV sero-prevalence among TB patients which peaked in 2003 and declined subsequently as follows:

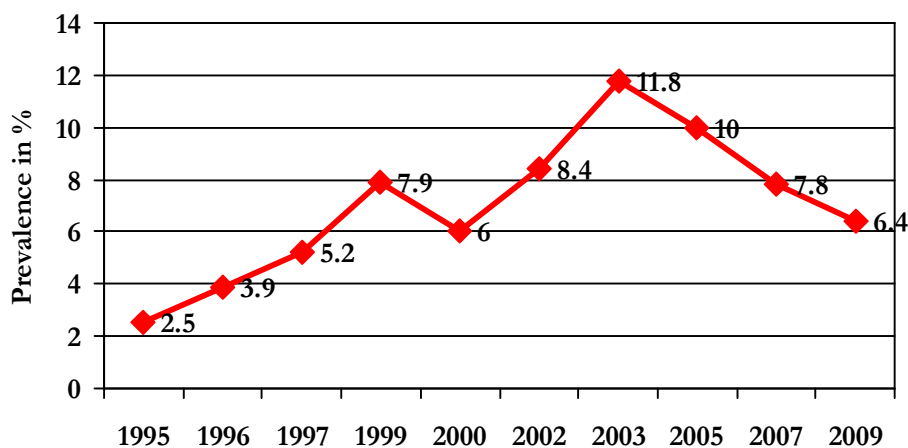
- 1995 : 2.50%
- 1996 : 3.90%

³ Fight AIDS, Fight TB, Fight Now: WHO

- 1997 : 5.20%
- 1999 : 7.90%
- 2000 : 6.70%
- 2002 : 8.40%
- 2003 : 11.8%
- 2005 : 10%
- 2007 : 7.8%
- 2009 : 6.4% (preliminary result)

The National Tuberculosis Control Programme in collaboration with JICA TB Control Project conducted the National HIV Seroprevalence Survey among TB patients in 2003 for the 1st round, in 2005 for the 2nd round, in 2007 for 3rd round and more recently with USAID support through TBCAP in 2009 for the 4th round. The result showed that 11.8 %, 10 %, 7.8%, and 6.4% of TB patients respectively were HIV positive.

Trend in HIV Sero-prevalence among TB patients



III. Policies, Strategy and Guidelines

In 2009, in addition to the number of documents that have been already developed, the National Tuberculosis Control Programme developed a number of documents such as:

- Annual Operational Plan for TB control for 2009 and 2010
- Draft strategic plan for TB control 2011-2015
- Clinical TB/HIV Operational Guideline
- PPM-DOTS guideline
- Draft on MRD-TB guideline
- Draft SOP for TB in prison

IV. Capacity Building and Human Resources Development

1. Training activities and workshop :

The National Tuberculosis Control Programme (NTP) has organized the trainings and workshops activities in 2009 as follows :

a). Training:

- 16 Training courses on TB / HIV activities.
- 15 Training courses on sputum collection and smear making
- 2 Training courses on X-ray reading
- 1 Training course on Tuberculin Skin Test (TST)
- 1 Training course on fluorescent smear microscopy
- 1 Training course on TB supervisory visits
- 3 Training courses on PPM-DOTS Health Education
- 6 Refresher training courses on DOTS strategies
- 1 Training course on INH preventive therapy for those who are living with TB patients
- 4 Training courses on ACSM for TB control
- 1 Training courses on Childhood TB and EP Tuberculosis
- 6 Basic training courses on TB control to TB staff in prison

- 1 Training course on planning and budgeting tools
- 3 Training courses on professional positive thinking
- 1 Training course on Infection Control
- 1 Training course on Kenesitherapy
- 2 Training courses on TB health education in factories

b). Workshops :

- 1 Annual TB Conference for TB control
- 9 Workshop on TB/HIV activities.
- 2 Workshop on contact investigation among people living with TB patients
- 10 Workshops on EQA TB laboratory
- 1 Workshop on TB drug Management.
- 5 Workshops on improving TB diagnosis .
- 1 Workshop on annual plan for TB control 2010
- 1 Workshop on Laboratory Plan 2010-2015
- 1 Workshop on evaluation on JICA project
- 1 Workshop on evaluation on quality of chest radiography
- 5 Workshops on PPM DOTS Activities.
- 1 Workshop on C-DOTS Activities.
- 1 Workshop on strategic planning for human resources for TB Control.
- 2 Workshops on improving TB diagnosis for HIV patients
- 1 Workshop on monitoring and evaluation of TB control in factories
- 1 Workshop on PC System.
- 1 Workshop on TB case finding among children.

- 3 Quarterly Workshop on monitoring and evaluation for TB control

* NTP also sent the TB staff to attend the international training courses, study tours and meeting/conferences in 2009 as follows:

- Philippine : 7 persons
- Korea : 2 persons
- Thailand : 1 person
- Brazil : 1 person
- Japan : 1 person
- Viet Nam : 5 persons
- Netherlands : 1 person
- Indonesia : 3 persons
- China : 12 persons
- Mongolia : 2 persons
- Switzerland : 1 person
- Mexico : 6 persons

2. Supervision :

To strengthen the TB control activities and improve the capacity of staff at peripheral level, in 2009 NTP conducted 404 TB supervisory visits throughout the country.

V. Financing

NTP formulated 5-year expenditure framework in accordance with the strategic plan with active consultation with major donors and clear indication of

funding gaps. Also, budget plan for 2009 was developed based on annual activity plan. NTP negotiated with potential partners for financing the program. These indicate the improved ability of CENAT in terms of financial mobilization for TB control activities.

In 2009, CENAT was charged additionally with new responsibility as Principal Recipients (PR) for GFATM-R7 managing the financing of 11 sub-recipients (SRs).

VI. Drugs and Lab. Reagents

National Tuberculosis Program (NTP) monitors closely the situation of drug consumption, laboratory reagents, estimate future drug requirement and laboratory reagents as well as budget estimation.

TB Drug Management (TBDM) is the one core element of the five elements of DOTS strategy because TB drug is an essential weapon for TB control. If each element does not function well, it will affect the greater part of the performance of TB Program.

In order to improve TB Drug Management, NTP in collaboration with Department of Drug and Food, Central Medical Store (CMS) of Ministry of Health (MoH), and other partners including Japan International Cooperation Agency (JICA) have conducted the following activities:

- NTP monitors closely the stock situation, distribution and the use of TB drug through database system and conducts TBDM surveys.

- In the year 2009, NTP procured TB drugs which are financially supported by Global Fund to fight HIV/AIDS, TB and Malaria, Round 5, for 3rd batch and received TB drug for children from GDF/ World Health Organization.

- Discussed and arranged the need of TB drugs as well as facilitating and following up TB drugs arrival under the support of TB GFATM round 5 for 3rd batch.

- In 2009, NTP was supplied with TB drugs by GFATM round 5 for 3rd batch consisting of 6,301,344 tablets of Rifampicin/Isoniazid/Pyrazinamide /Ethambutol (150/75/400/275 mg), 14,246,400 tablets of Rifampicin/Isoniazid

(150/75mg), 487,200 tablets of Ethambutol (400mg), 69,300 vials of Streptomycin (750mg) and 69 300 vials of water for injection. In addition, NTP also received TB children drugs from Global Drug Facility consisting of 800,940 tablets of RHZ (60/30/150mg), 1,464,966 tablets of RH (60/30mg) and 205,000 tablets of Ethambutol (100mg).

- NTP facilitates additional drug request for some ODs, as needed.

-In every quarterly workshop of NTP, TBDM is the one topic which has always been presented especially focusing on distribution and TB drug request.

-NTP always sends its officers to attend regular drug management meetings organized by MOH to report NTP TBDM activities and obtain information on the current national drug management issues.

- In the middle of 2009, NTP conducted the Assessment Survey of TB Drug Management in 3 operational districts of 3 provinces through is the last support of JICA/CENAT project to monitor quality of DOTS implementation and to improve TB drug distribution and TB drug use practices. The result of TB Drug Management Survey in the year was better than the previous years and was presented in the national workshop on TB drug management.

VII. Service provision

The diagnosis and treatment of tuberculosis are free of charge in all TB services throughout the country. Currently, there are 1070 health facilities providing DOTS.

1. Case Detection Activity :

TB case detection nationwide in 2009 are as follows:

Case Detection in 2009	Number of TB cases
New smear positive pulmonary TB	17,863
Relapse	432

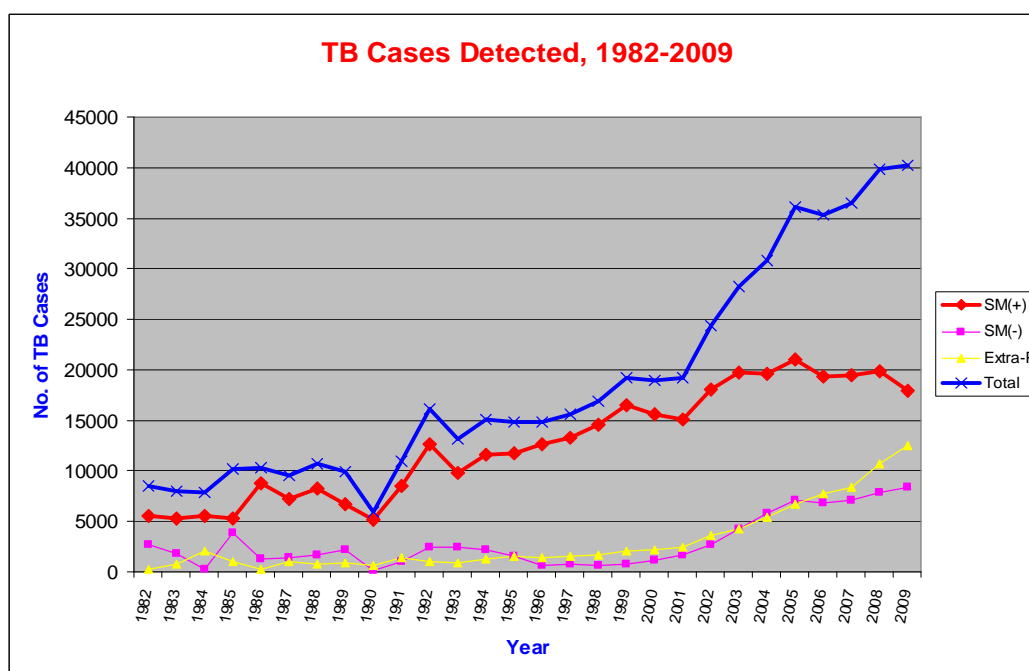
Failure cases	57
Return After Default	12
New smear negative pulmonary TB	8378
New extra pulmonary TB	12,529
Other Cases	928
Total (all form of Tuberculosis)	40,199

According to the above TB case notification, the case detection rate of new smear positive pulmonary TB in 2009 was 62 %.

The table below shows the age and sex distribution of the new smear positive pulmonary TB case detected in 2009.

Age	0-14	15-24	25-34	35-44	45-54	55-64	> 64	Total	%
M	37	746	1522	1884	2117	1543	1548	9397	53%
F	45	801	1252	1461	1894	1637	1376	8466	47%
Total	82	1547	2774	3345	4011	3180	2924	17863	100%
%	1%	8%	16%	19%	22%	18%	16%	100%	

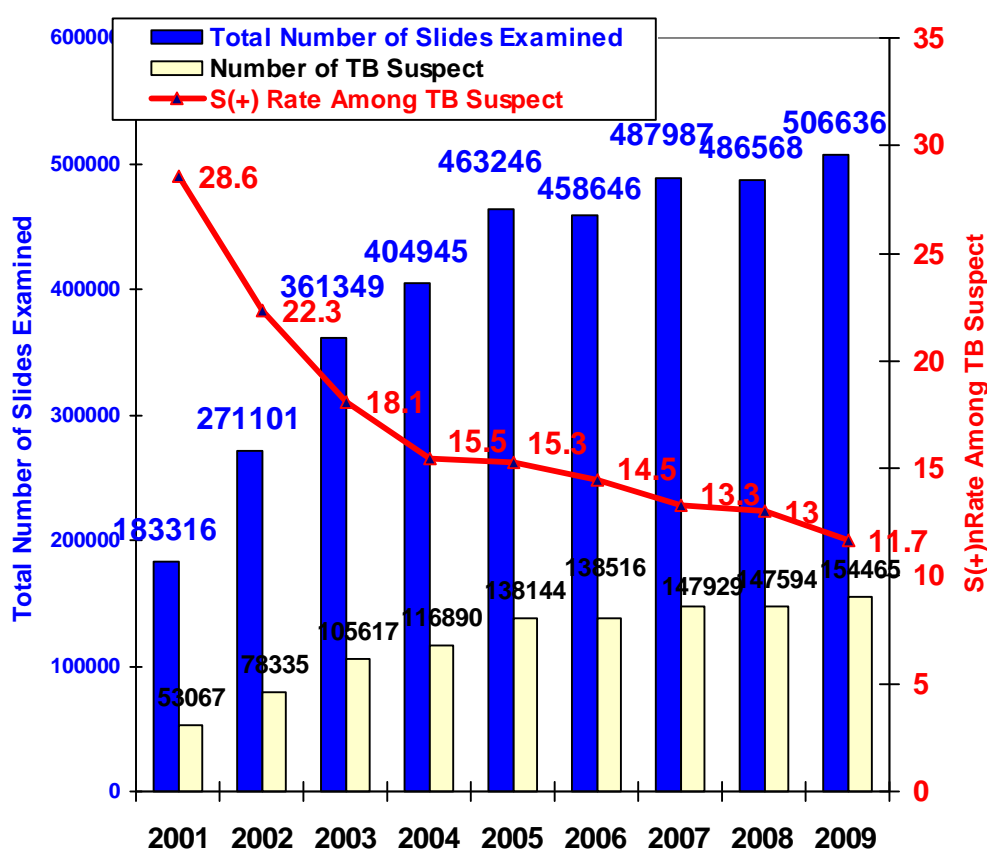
TB Cases Notification, 1982-2009



2. Diagnosis by bacteriological examination:

The total number of slides on which the National Tuberculosis Program performed smear examination in 2009 was 506,636 (detection and control) of which 453,445 slides were for case detection. The positive rate among slides examined for case detection is 11.7%.

To strengthen the quality of sputum examination, NTP cross check certain member of slides as a part of the laboratory quality assurance activities. Results showed that false positive rate was 3.2%, false negative 2.2%, and agreement rate 97.7% in 2009.



3. Sputum Conversion rate at month 2:

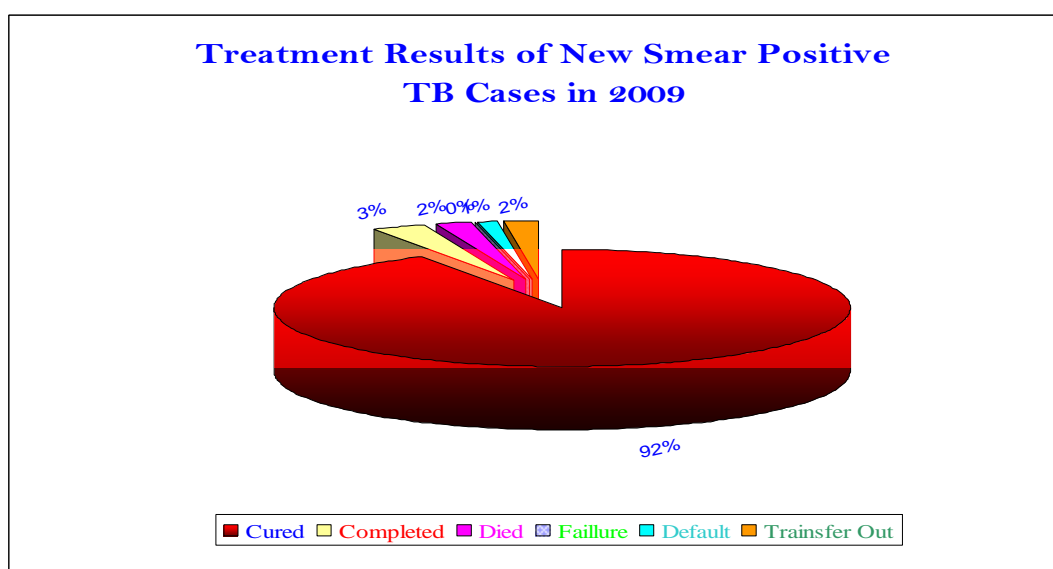
The Conversion rate at month 2 from sputum positive to negative is 94% in 2009.

4. Treatment Results :

Due to the existence of good recording and reporting system, the National Tuberculosis Control Program can evaluate the treatment results through Cohort Analysis for TB patients registered under treatment in previous 12 months (2008).

For 19,811 new smear-positive TB patients that received Cat-1 (2RHEZ/4RH) treatment regimen, the treatment results in 2009 were as follows (see table2 in the annex for the details by province).

- Cured	:	92 %
- Treatment completed	:	3.0%
- Died	:	2.0 %
- Failure	:	0 %
- Defaulted	:	1.0 %
- Transferred out	:	2.0 %



5. DOTS provided by CENAT in Phnom Penh :

CENAT provided DOTS to 796 TB patients in Phnom Penh in 2009. Of those, 358 were Home Care DOT, 84 Ambulatory DOT and 354 Hospitalized DOT. Moreover, CENAT diagnosed 23 MDR-TB and all of them received treatment from MDR-TB service.

6. Other Activities :

a-TB active cases finding among adults :

Active case finding was conducted between September and December 2009 in 27 health centers, 8 operational health district, in 8 provinces. There were 4,344 adults population from 585 villages screened under this active cases finding.

As a result, 519 active case of pulmonary TB were found (115 smear positive and 404 smear negative) and 38 extra-pulmonary TB. In summary, a total of 557 active cases of TB were identified and put on treatment.

b-TB active cases finding among children :

In 2009, National TB Control Program conducted active case finding of Tuberculosis among children in 4 provinces (Takeo, Kampot, Kg Speur, and Prey Veng provinces).

In summary, 2,075 children were examined and tested by tuberculin skin test. Of those 2,075 children, 356 children were diagnosed as active TB cases and put on treatment.

This achievement was due to close collaboration between health worker at provinces, district and health centers together with VHSG.

VIII. DOTS Expansion

To obtain the objective of 70 % case detection rate of new smear-positive pulmonary TB, DOTS expansion to HCs level is one of the main activities of the program.

1).The steps in DOTS Expansion are the followings :

1- Pre-Assessment Visit (Situational Analysis)

- 2- Sensitizing Workshop for all stake holders
- 3- Training
- 4- Workshop before implementation
- 5- Supervision
- 6- Follow-up Workshop
- 7- Evaluation Workshop on DOTS implementation.
- 8- Monitoring and evaluation

2). Pilot Phase of DOTS Expansion:
in September 1999, 9 health centers were piloted in Ambulatory DOT.

3). Phase of Expanding DOTS to Health Centers:

- By 2000, 59 health centers were expanded in DOTS.
 - By 2001, 268 health centers were expanded in DOTS.
 - By 2002, 392 health centers were expanded in DOTS.
 - By 2003, 704 health centers were expanded in DOTS.
 - By the end of 2004, the National TB Control Programme expanded DOTS to all health centers nationwide.
-
- In summary, in 2009, 1070 health facilities provided TB treatment with DOT nation-wide.

IX. Community DOTS

1. The Overall Goal of Community DOT implementation

The Overall Goal of Community DOTS implementation is to improve case finding through referral of TB suspects by communities, to provide TB drugs to patients who are unable to take TB drug everyday at Health Center (and only less severe patients) to ensure that TB patients take TB drugs correctly,

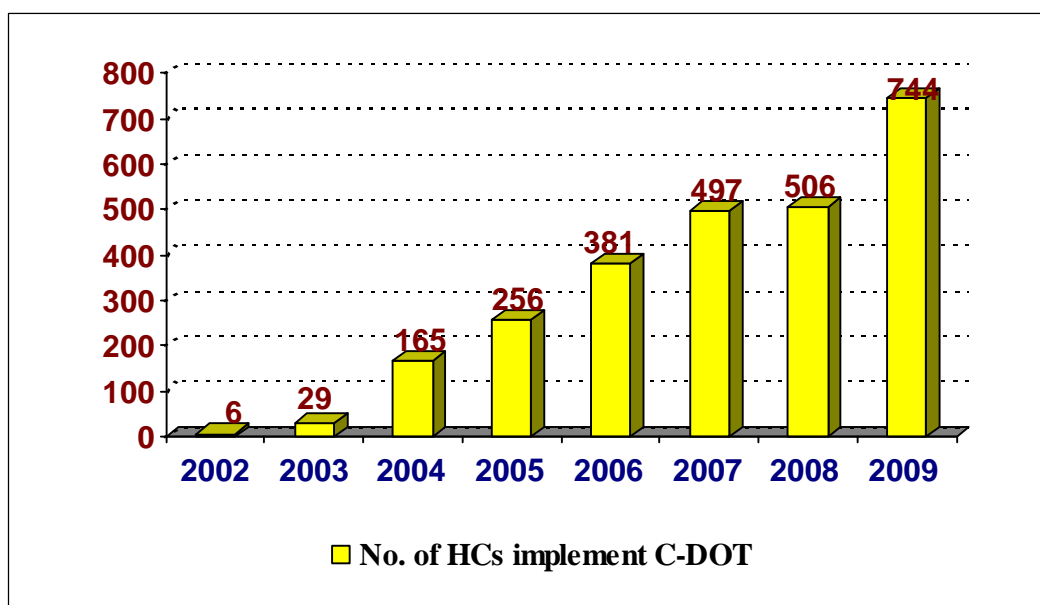
completely, and to support the implementation of the new 6 month treatment regimen, 4 FDCs especially in the continuous phase etc.

2. Background of Community DOTS

In 2002, in cooperation with CENAT, three ODs began piloting a Community DOTS (C-DOTS) programme – Bakan OD (Pursat Province), O’Chrouv and Preah Net Preah ODs (Banteay Meanchey Province), which were supported by CARE. In 2003, further pilot projects were established in Angkor Chey OD (Kampot province) under support from RACHA, in Svay Rieng and Chipou ODs (Svay Rieng Province) under support from CHC, and Mongkol Borei OD (Banteay Meanchey province) under support from CARE. In 2004, there were further pilot projects, in Kratie OD, Kratie Province (in collaboration with PFHD), Cheung Prey, Memot, Dambe-Ponheakrek ODs in Kampong Cham Province (in collaboration with SCA), Sangke and Thmarkol ODs in Battambang Province (in collaboration with RHAC) and Kampong Tralach OD, Kampot Province (in collaboration with CHC). In 2004, community DOTS were started in Kratie, Battambang and Kg.Cham by PFHAD, RHAC and SCA respectively.

In 2009, the total Health Centers implementing Community DOTS Increased to 744 HCs as shown in the chart below.

3- Expansion of CDOTS Health Center



- By 2002, 6 health centers were started with C-DOTS
- By 2003, 23 health centers were expanded with C-DOTS.
- By 2004, 136 health centers were expanded with C-DOTS.
- By 2005, 91 health centers were expanded with C-DOTS.
- By 2006, 125 health centers were expanded with C-DOTS.
- By 2007, 116 health centers were expanded with C-DOTS.
- By 2008, 8 health centers were expanded with C-DOTS.

In summary, 744 HCs cumulatively have been implementing Community DOT (C-DOT) in 68 ODs by the end of 2009.

4. Achievement of CENAT related to CDOTS

- **GUIDELINES** on **COMMUNITY DOTS IMPLEMENTATION** have been distributed.
- **GUIDELINES** for supporting TB treatment “DOTS Supporter” have been distributed.

5- Contribution of Community DOTS implementation

In addition to the availability of good quality of DOTS services at public health facilities (1070), community DOTS contributes to improving access to information (place where to receive TB diagnosis and treatment), increasing awareness of tuberculosis and its signs and symptoms, decreasing levels of stigma in the communities, and maintaining good compliance to treatment leading to excellent treatment outcome more than 85% countrywide.

6- Health Centers implement C- DOT in 2009 support by NGOs

In 2009, there were 13 implementers operating C-DOTS in 744 HCs as shown in the table below:

Name of C-DOTS implementers	No of HC
CATA	6
CHC	122
CRS	24
FHI	52
HEAD	55
HU	5
P-FHAD	82

PK	10
RHAC	193
RACHA	122
SCA	60
SHCH	5
VORORT	8
Total	744

7- Constraints and Challenges

- Limited Quality of Community DOTS: HC staff's capacity is still limited to arrange CDOT, to do supervisory visits to the communities, to provide health education to patients and DOT Supporters, and to perform complete and accurate recording and reporting relating to C-DOTS.
- Movement of population: TB patients or sometime DOT watcher move seasonally to earn their living, without communicating with HC staff.
- Motivation of the HC's staff and OD TB supervisors is limited.
- The co-infection of TB / HIV.

X. Collaborative TB/HIV activities:

1. Training:

In collaboration with National Center for HIV/AIDS, Dermatology and STD (NCHADS), National Center for TB and Leprosy Control conducted TB/HIV training to 6 Operational Districts more in 2009. Total number of trained TB/HIV ODs is 74 as follow:

- 2004: 9 ODs in 4 provinces has piloted the TB/HIV collaborative activities with support from FHI, CDC, WHO and JICA
- 2005: 10 ODs, Smach Meanchey, Seam Reap, Sotnikum, Sampov Meas, Daunkeo, Svay Rieng, Kampong Cham-Kampong Siem, Neak Loeung, Kampong Trach, and Takmao ODs.

- 2006: 9 ODs, Kampong Chhnang, Kampong Speu, Kampot, Prey Veng, Kampong Thom, Kirivong, Memot, Tbaung Khmom and Cheung Prey ODs.
- 2007: 24 ODs, Angroka, Prey Chhor, Srey Santhor, Ponhea Krek, Chamkaleu, Chipou, Romeas Hek, Sre Ambil, Kralanh, Koh Thom, Kien Svay, Kampong Trabek, Messang, Baray Santok, Kmpong Tralach, Boribo, Kratie, Chhlong, Stung Treng, Pailin, Thmorkol, Sampov Loun, and Sangke ODs.
- 2008: 16 ODs, Preah Net Preah, Kang Pisey, Staung, Sen Monorom (Modulkiry), Banlong (Ratanakiry), Angkorchey, Bakan, Preah Sdach, Pear Raing, Angsnoul, Mouk Kampoul, Oraing Ov, Krauchma, Prey Kabas and Bati ODs.
- 2009, 6 ODs, Angkor Chum, Saang, Kamchay Mear, Chhouk, Tbeng Mean Chey (Preah Vihear), and Kep ODs.

2. Clinical TB/HIV guideline development and training

In good collaboration with developing partners, FHI, US-CDC, MSF, CHC, WHO, JICA, URC,HOPE, and other partners, CENAT and NCHADS have developed TB/HIV clinical management guidelines and training curriculum for medical doctors, medical assistants who are currently working at TB ward at referral hospital, national pediatric hospital and NGOs. The clinical TB/HIV clinical management guidelines was approved in 2009.

In 2008, the 5 day-training course of TB/HIV clinical management were conducted for participants from Banteay Meanchey, Battambang, Pailin, Pursat, Kg Chhnang, Kg Cham, Kratie, CENAT, National Pediatric Hospital, Kossomak Hospital, Chhouk Sar (NGO clinic where TB screening and ART are introduced), Takeo and Phnom Penh. And by the end of 2009, the cumulative number of batches being trained is of 8 batches (221 medical health staff) which were trained on the TB/HIV clinical management.

The 5-day training covers:

- a. communication skills for patients and health care providers

- b. Epidemiology and pathogenesis of TB/HIV
- c. Pulmonary TB
- d. Extra-pulmonary TB
- e. TB/HIV prevention
- f. Treatment strategy
- g. Drug interaction (TB drugs and ARV drugs)
- h. Diagnostic procedure
- i. X-ray reading for complicated cases
- j. Drug side effect
- k. Childhood TB/HIV
- l. MDR TB in HIV patients
- m. Special circumstances
- n. TB Immune Reconstitution Inflammatory Syndrome (IRIS)

In order to evaluate the participants knowledge improvement, the pre-test and post test are introduced.

3. Revised National Framework for TB/HIV collaboration

A revised framework to address TB/HIV co-infection in the Western Pacific Region was officially released in 2008. During National Workshop on TB/HIV collaborative activities, this WHO revised framework was presented and the recommendation for modification for the existing Cambodia TB/HIV framework was made in order to adapt the need of Cambodia context and to be relevant to current situation. Technical Working Group for TB/HIV has drafted the revised framework for TB/HIV collaboration and will get approved in 2010.

The content of the framework covers

- a. Introduction and background for TB/HIV collaboration,
- b. HIV screening and Diagnosis among TB patients
- c. 3Is (Intensified TB case finding among PLHA, INH Preventive Therapy, and Infection Control)
- d. Main recommendation on treatment of TB/HIV co-infection (including CPT)

- e. TB/HIV co-infection in special groups: Children and closed setting and IDU
- f. Coordination, roles, and responsibilities of HIV and TB programs at different levels (including national, provincial, OD, facility and community level)
- g. Supplies and logistics management
- h. Monitoring and Evaluation
- i. Annexes

Reprinted and Developed new IEC materials for TB/HIV activity

TB/HIV leaflets were developed in 2006, and in 2009 JICA reprinted and developed the flipchart and the poster about TB/HIV for use in the whole country.

- 4. National TB/HIV Workshop :** The two national programs in good collaboration with the Development Partners, conducted the third National Workshop on Collaborative TB/HIV activities from 23th -24th November 2009. It is a forum where the stakeholders, partners and health workers working for TB control and HIV/AIDS control, meet and discuss how to improve the TB/HIV collaboration by looking at referral of TB patients to VCCT for HIV testing, referral of PLHA for TB screening, and recording and reporting. The main objectives of the conference were as follow:
- to present the new revised TB/HIV framework including 3Is: Intensified TB case finding, INH preventive Therapy, Infection Control
 - to introduce the roadmap for implementation of IPT and IC
 - to strengthen the Recording and reporting for TB/HIV activities:
 1. TB screening/IPT among PHA from NCHADS
 2. HIV screening among TB patients from CENAT
 3. Infection Control from both sites
 4. Presentation of current TB/HIV activities in selected provinces
 - to present the preliminary result of HIV sero-prevalence among TB patients, 2009

-to introduce the revised TB monthly and quarterly recording and reporting

Participants included PHD directors, OD directors, Provincial TB Supervisors, PAOs, OD TB supervisor and NGOs and partners working in the field of TB/HIV with the total number of around 316.

Participants were divided into 6 groups based on geographic, epidemiological situation and their experiences. These groups held discussions on the following topics:

- 1/- Intensified TB case finding among PLHIV for 2 different groups
- 2/- INH Preventive therapy for 1 group
- 3/- Screening HIV among TB patients for 1 group
- 4/- Infection Control for 1 group
- 5/- The coordination and harmonization of TB/HIV activities at the field levels for 1 group

5. TB/HIV Data :

HIV / AIDS Among TB Patients 2009									
Quarter	Number of TB cases registered for treatment (including HIV+)	Number of TB Cases Registered for treatment (excluding HIV+)	Number of TB Cases Referred to VCT for HIV testing	Number of TB Cases tested for HIV at VCT	HIV+	HIV -	CPT	OI/HBC	ARV
1	10,033	8,530	5,774	5,489	119	5,370	256	228	143
2	9,448	8,870	6,043	5,678	70	5,608	240	217	100
3	10,150	9,475	6,728	6,582	117	6,465	296	261	138
4	10,568	10,123	7,573	7,296	90	7,206	289	278	145
Total	40,199	36,998	26,118	25,045	369	24,649	1,081	984	526

Based on the above table, 70.59% (26,118/36,998) of TB patients with unknown HIV status were referred for HIV testing, out of them around 95.89%

(25,045/26,118) tested for HIV at VCCT. The positive rate of HIV in unknown TB patients who were referred and tested at VCCT is around 1.47% (369/25,045).

Since National TB control program receives budgetary support (from TBCAP, GFATM, CHC, JICA and other NGOs) for referring TB patients or referring TB patient blood to VCCT for HIV testing, number of TB patients tested for HIV is increasing from 54% in 2008 to 70.59% in 2009. Cotrimoxazole preventive therapy is given to all HIV positive TB patients and also anti-retroviral treatment during TB treatment is provided to all eligible HIV positive TB patients who meet the eligibility criteria.

TB Among PLHA 2009								
Quarter	Number of HIV + clients registered at VCCT	Number of HIV+ clients at VCCT referred to OI/ART service for TB screening	Number of HIV+ clients screened TB at OI/ART	BK+	BK-	EPTB	Total	Number of HIV+ received IPT
1	2,886	773	1,190	125	194	134	453	11
2	1,649	694	1,184	68	137	136	341	3
3	1,186	617	1,060	102	153	155	410	8
4	1,350	855	1,233	67	115	153	335	21
Total	7,071	2,939	4,667	362	599	578	1,539	43

XI. Multi drug resistant TB (MDR-TB)

NTP collaborates with its partners, especially Cambodian Health Committee (CHC), Médecin Sans Frontière France (MSF/F), CDC/GAP, to provide services for MDR diagnosis and treatment, and in development of MDR TB guideline.

By the end of 2009, there are 8 MDR-TB treatment sites with 45 isolations rooms (see table below).

N ^o	Treatment sites	Number of isolation rooms
1	CENAT	7
2	Mittapheap Khmer-Soviet Hospital	20
3	Battambang	6
4	Takeo	4
5	Siemreap	2
6	Svay Rieng	2
7	Koh Kong	2
8	Kampong Cham	2
	Total: 8 treatment sites	45 isolation rooms

1. Case finding strategies:

The following patients are considered as MDR-TB suspects and evaluated for MDR-TB:

- 1- All smear-positive pulmonary tuberculosis treated with category II treatment regimen.
- 2- New smear-positive pulmonary tuberculosis living in close contact with known MDR-TB case.
- 3- Non converter at month 3 for smear-positive pulmonary tuberculosis treated with category I treatment regimen.

2. Diagnosis:

All MDR-TB suspects are requested to submit 3 sputum samples which are sent to the laboratory to perform:

- 1- Smear microscopy
- 2- Culture
- 3- Identification
- 4- Drug susceptibility testing.

3. Treatment:

All confirmed MDR-TB cases received the standardized category IV treatment regimen as follow:

6 Z E* Km (or Cm) Lfx (or Mfx) Eto Cs (or PAS) /
18 Z E* Lfx (or Mfx) Eto Cs (or PAS)

* If still susceptible by drug susceptibility testing.

4. Achievement:

In 2009, NTP screened 329 MDR-TB suspects. Among them, 39 cases were MDR-TB. (See below)

Screened	329 suspects
- MTB	113 cases
o MDR-TB	39 cases
o PDR/Mono	17 cases
o Susceptible	50 cases
o Pending	07 cases
- NTM	39 cases
o MAC	04 cases
o M. scrofulaceum	02 cases
o M. intracellulareae	02 cases
o M. interjectum	02 cases
o M. abcesus	01 case
o Pending	28 cases
- Sterile	128 cases
- Contaminated	06 cases
- Pending	43 cases.

From 2006 till the end of 2009, 114 patients in total have been enrolled for treatment and follow-up (see below):

Total patients: 114

- DR-TB 89 cases:
 - o XDR-TB 01 case
 - o MDR-TB 86 cases
 - o Mono/PDR 02 cases

- NTM 25 cases.

5. Challenges:

- Staff's capacity is still limited in MDR-TB management
- Number of Health staff in MDR-TB service is not enough
- Incentives for H staff working with MDR-TB patients is not appropriate
- Isolation rooms is not enough (inadequate isolation room)
- Few patients refuse to accept treatment
- Some patients refuse to receive treatment in hospital
- Some patient drop out their treatment
- Management on side-effect for MDR-TB patients is still limited
- Transportation means used to trace defaulter and supervise is not appropriate

XII. Public-Private Mix DOTS (PPM-DOTS)

Public-Private Mix DOTS is an intervention of DOTS Expansion of the National Tuberculosis Program. Since 2005 the National Tuberculosis Program in collaboration with JICA, USAID, URC, PATH and other institutions such as Cambodia Pharmacy Association, Cambodia Medical association, has been establishing the PPM-DOTS model in which private sectors involved are individual private physicians, private hospitals, pharmacists, drug sellers and private lab technicians. By the end of 2009, PPM-DOTS activities have been implemented in 38 ODs in 10 provinces namely Phnom Penh, Battambang, Sihanuk ville, Kampong Cham, Siem Reap, Pursat, Takeo, Kampong Speu, and Kandal.

Private providers, in implementing this PPM-DOTS, have the main roles in identifying TB suspects, guide /explain about TB, and refer TB suspects with referral slips to the government HCs or RH for diagnosis and treatment.

The PPM-DOTS has contributed to TB Control as follows :

- enhance the quality of TB diagnosis and treatment as well as patient support providing the knowledge and skills through workshops, trainings which reduce the malpractice and misunderstanding and also limits the unnecessary and often costly treatments.
- increase the case detection rate and reduce the delay in diagnosing TB through private practitioner participation in referring timely all TB suspects for diagnosis and treatment at public health TB network. These prevent emergence of multi-drug resistant TB.
- improve the equitable access to high quality of DOTS by involving private practitioners from whom the poor vulnerable people seek care.
- protect the poor and vulnerable people from inappropriate expense by sending them to public facilities for diagnosis and receive free of charge treatment.
- contribute towards completeness of epidemiological surveillance on TB when both private and public sectors who diagnose and treat TB follow proper TB recording and reporting system of the National Tuberculosis Program
- improve the management capacity of both the public and the private sectors and there by contribute to health system strengthening.

There are some challenges despite the PPM-DOTS has been in progress,:

- number of drop out of referring TB suspects still high
- limitation of resources in data collection from private and public
- limitation of resources in supervision
- the current diagnosis is a little bit late for the patient
- motivation to service providers in both sectors.

- limitation of confidence on public facilities
- small scale of PPM-DOTS implementation

In summary, the achievement related to case finding and treatment of tuberculosis in 2009 under PPM-DOTS activities are shown in the table below:

Year	Province	OD	No. of Private implementing PPM-DOTS	No. of TB suspects referred from private	No. of TB suspects received by public	No. of Smear Positive TB Cases	Total TB Cases Treated
2005	2	3	287	314	242	29	46
2006	8	15	755	1989	1154	130	244
2007	11	38	980	5562	2763	379	533
2008	11	38	1690	4212	1882	220	301
2009	10	38	1735	9781	5540	564	769

XIII. IEC and Advocacy

In 2009, the activities and achievements related to IEC and Advocacy conducted by NTP are as follows:

-Capacity building for TB staff:

.Training on Professional performance and Positive Thinking: 12 courses in 11 ODs.

.Training on ACSM strategies tuberculosis 6 courses provided to PHD and OD level that is Phnom Penh,Kratie,Takeo,Battambang, Bateay Mean Chey,Siem Reap,Pursat,Kandal,Kampong Speu, Preah Sihanuk,Kampong Cham and NGOs partners working on TB.

This course initiation and collaborate between CENAT and PATH with formal support from USAID.

-Quarterly workshop on review activities IEC all 24 provinces

. was jointly organized by

-Produce IEC materials and disseminate messages to the general population through various means such as radio, TV, newspapers, posters and leaflets. It has also cooperated with other NGOs such as WHO, USAID, FHI, PATH and JICA in providing technical skill, producing and disseminating the IEC materials to population.

In addition, the program provided updated information on TB situation to MoH and other organizations so as to make them aware of the TB situation as well as the program activities in Cambodia and sought for support to the program. Similarly, for advocacy purpose, NTP promotes the World TB Day from central to peripheral level throughout the country.

XIV. Information System

NTP has developed the standardized recording and reporting system for the program monitoring and evaluation. Through this system, the program can analyze and evaluate the TB situation in Cambodia. TB Bulletin, Quarterly TB Report and Annual TB Magazine are regularly published and disseminated to all related agencies.

XV. Research

The National Tuberculosis Program (NTP) in collaboration with JICA TB Control Project with financial from WHO/TBCAP and Global Fund Round 5, have conducted the 4th round of National HIV sero-prevalence Survey among TB patients in July 2009. The preliminary results showed that the prevalence rate of HIV among TB patients nationwide is 6.4 %.

XVI. Partnership

Mechanism of coordination with other partners in TB control was established with the set-up of a committee called Inter-agency Coordination Committee for TB Control (ICC) in 2001. This committee is now called the

Sub-Technical Working Group (Sub-TWG) for TB Control. The main terms of reference of the committee are to technically advice on the program management and to assist the program in coordination as well as resources mobilization. So far the ICC has been functioning very well with especially its regular and ad hoc meeting.

NTP also collaborate with organizations, and research institutes abroad. Through this mechanism, we can identify areas of cooperation and funding for the program.

The National Program has also cooperated with the World Food Program through this, the World Food Program provided the support to the TB patients nationwide.

In addition, the National TB Control Programme (NTP) has a number of partners/organizations involving in the fight against tuberculosis. Those partners are listed as below:

1. World Health Organization (WHO)
2. United Sates Agency for International Development (USAID)
3. United Sates Centers for Disease Control and Prevention (US CDC)
4. Japan International Cooperation Agency (JICA)
5. Research Institute of Tuberculosis, Japan (RIT)
6. TBCAP
7. World Food Programme (WFP)
8. Medecin Sans Frontier-French (MSF-F)
9. Medecin Sans Frontier-Belgique (MSF-B)
10. Pasteur Institute
11. Cambodia Anti-tuberculosis Association (CATA)
12. Cambodia Health Committee (CHC)

13. Catholic Relief Service (CRS)
14. Family Health International (FHI)
15. Health Alliance Development (HEAD)
16. Health Unlimited (HU)
17. Partner for Health and Development (P-FHAD)
18. Ponleu Komar (PK)
19. Reproductive Health Association of Cambodia (RHAC)
20. Reproductive and Child Health Alliance (RACHA)
21. Save the Children Australia (SCA)
22. Sihanouk Hospital Center of HOPE (SHCH)
23. VOR ORT

XVII. Annexes

Cure rate by Provinces , year 2009

Table 1

N°	Province	Cure Rate
1	<i>Kandal</i>	97%
2	<i>Svay Rieng</i>	95%
3	<i>Phom Penh</i>	90%
4	<i>Pursat</i>	94%
5	<i>Battambang</i>	89%
6	<i>Pailin</i>	76%
7	<i>BMC</i>	90%
8	<i>Siem Reap</i>	98%
9	<i>Oddar MC</i>	88%
10	<i>Kg Thom</i>	96%
11	<i>Takeo</i>	91%
12	<i>Kg Speu</i>	90%
13	<i>Kampot</i>	97%
14	<i>Kep</i>	85%
15	<i>Kg Som</i>	86%
16	<i>Koh Kong</i>	85%
17	<i>Prey Veng</i>	95%
18	<i>Kg Chhnang</i>	93%
19	<i>Kratie</i>	87%
20	<i>Kg Cham</i>	91%
21	<i>Stung Treng</i>	92%
22	<i>Preah Vihear</i>	91%
23	<i>Modulkiri</i>	65%
24	<i>Rattanakiri</i>	77%
	Total	92%

ANTI-TUBERCULOSIS ACTIVITIES BY PROVINCES, 2009 (NTP)

Table 2

PROVINCES	CASES FINDING ACTIVITIES													DETECTION RATE				
	NC									BK+(%)	(%)	(%)	(%)	New S(+)	S(+)	Smear(-)	EP/	TOTAL
	BK+	Relap	Fail	RAD	ReTt	BK-	EP	OTER	Total	New	ReTt	BK-	EP	100,000 habitants				
KANDAL, 8 (OD)	1,468	29	1	0	30	684	1,265	29	3,476	42%	1%	20%	36%	116	118	54	100	275
SVAY RIENG, 3 (OD)	919	30	0	0	30	773	764	212	2,698	34%	1%	29%	28%	190	197	160	158	559
PHNOM PENH 4 OD and National Hospital	1,035	68	31	6	105	817	1,220	119	3,296	31%	3%	25%	37%	78	83	62	92	248
PURSAT, 2 (OD)	559	24	0	0	24	226	485	36	1,330	42%	2%	17%	36%	141	147	57	122	335
BATTAMBANG, 5 (OD)	824	22	5	0	27	425	570	35	1,881	44%	1%	23%	30%	80	83	41	56	183
PAILIN, 1 (OD)	72	2	0	0	2	27	139	8	248	29%	1%	11%	56%	102	105	38	197	352
BANTEAY MEANC. 4 (OD)	956	17	0	0	17	686	434	100	2,193	44%	1%	31%	20%	141	144	101	64	324
SIEM REAP, 4 (OD)	1,480	29	5	0	34	1,022	900	56	3,492	42%	1%	29%	26%	165	168	114	100	390
ODORMEANCHEY,1 (OD)	328	3	0	0	3	65	84	13	493	67%	1%	13%	17%	177	178	35	45	265
KOMPONG THOM, 3 (OD)	1,076	10	0	0	10	239	206	13	1,544	70%	1%	15%	13%	170	172	38	33	245
TAKEO, 5 (OD)	1,441	26	0	0	26	661	803	93	3,024	48%	1%	22%	27%	171	174	78	95	358
KOMPONG SPEU, 3 (OD)	1,196	34	2	0	36	285	491	28	2,036	59%	2%	14%	24%	167	172	40	68	284
KAMPOT, 4 (OD)	801	27	0	0	27	230	405	61	1,524	53%	2%	15%	27%	137	141	39	69	260
KEP, 1 (OD)	31	0	0	0	0	9	28	0	68	46%	0%	13%	41%	87	87	25	78	190
KOMPONG SOM, 1 (OD)	161	1	0	0	1	115	160	7	444	36%	0%	26%	36%	73	73	52	72	201
KOH KONG, 2 (OD)	104	0	0	1	1	30	42	6	183	57%	1%	16%	23%	89	89	26	36	156
PREY VENG, 7 (OD)	1,819	51	1	0	52	872	2,176	47	4,966	37%	1%	18%	44%	192	197	92	230	524
KOMPONG CHHNANG, 3 (OD)	784	19	0	1	20	126	259	2	1,191	66%	2%	11%	22%	166	170	27	55	252
KRATIE, 2 (OD)	247	3	0	0	3	82	171	1	504	49%	1%	16%	34%	77	78	26	54	158
KOMPONG CHAM, 10 (OD)	2,100	34	8	4	46	920	1,748	59	4,873	43%	1%	19%	36%	125	127	55	104	290
STUNG TRENG, 1 (OD)	163	0	0	0	0	12	81	0	256	64%	0%	5%	32%	146	146	11	73	229
PREAH VIHEAR, 1 (OD)	182	1	1	0	2	49	65	1	299	61%	1%	16%	22%	106	107	29	38	175
MODULKIRI,1 (OD)	21	0	0	0	0	12	15	0	48	44%	0%	25%	31%	34	34	20	25	79
RATANAKIRI, 1 (OD)	96	2	3	0	5	11	18	2	132	73%	4%	8%	14%	64	65	7	12	88
24 PROVINCES	17,863	432	57	12	501	8,378	12,529	928	40,199	44%	1%	21%	31%	133	137	63	94	300

ANTI-TUBERCULOSIS ACTIVITIES BY PROVINCES, 2009 (NTP)

Table 3

PROVINCES	NEW CASE ACTIVITIES OF BK+ BY AGE																
	0-14Y		15-24Y		25-34Y		35-44Y		45-54Y		55-64Y		>=65Y		TOTAL		TOTAL
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
KANDAL, 8 (OD)	1	0	57	80	111	107	138	105	153	155	123	146	142	150	725	743	1,468
SVAY RIENG, 3 (OD)	0	1	44	50	62	64	80	93	103	137	69	86	60	70	418	501	919
NATIONAL HOSPITAL	1	1	48	22	61	32	68	24	60	21	30	17	28	13	296	130	426
PHNOM PENH, 4 (OD)	0	0	40	53	118	58	65	36	72	31	38	29	27	42	360	249	609
PURSAT, 2 (OD)	2	1	16	30	40	44	57	46	70	53	52	69	40	39	277	282	559
BATTAMBANG, 5 (OD)	2	5	34	37	62	51	116	47	112	67	83	65	87	56	496	328	824
PAILIN, 1(OD)	0	0	6	6	5	7	13	5	9	4	10	2	1	4	44	28	72
BANTEAY MEANCHHEY. 4 (OD)	4	3	43	40	92	47	106	66	155	101	99	82	69	49	568	388	956
SIEM REAP, 4 (OD)	2	0	67	56	140	99	163	140	218	166	128	128	97	76	815	665	1,480
ODORMEANCHEY 1 (OD)	0	0	16	14	41	18	31	40	52	39	26	32	11	8	177	151	328
KOMPONG THOM, 3 (OD)	2	2	52	62	100	93	104	95	123	103	73	100	93	74	547	529	1,076
TAKEO, 5 (OD)	2	0	55	38	108	88	134	111	129	132	165	163	150	166	743	698	1,441
KOMPONG SPEU, 3 (OD)	0	3	41	71	86	90	121	118	112	119	95	123	118	99	573	623	1,196
KAMPOT, 4 (OD)	2	1	27	26	47	49	76	53	121	122	63	58	80	76	416	385	801
KEP, 1 (OD)	0	0	1	1	2	3	3	3	4	1	4	5	3	1	17	14	31
KOMPONG SOM, 1 (OD)	1	0	7	6	21	6	12	6	44	32	7	5	10	4	102	59	161
KOH KONG, 2 (OD)	2	0	6	5	10	11	16	5	20	3	4	8	9	5	67	37	104
PREY VENG, 7 (OD)	6	6	57	55	123	134	174	178	164	258	149	197	157	161	830	989	1,819
KOMPONG CHHNANG, 3 (OD)	1	0	26	32	47	64	78	55	83	84	72	84	75	83	382	402	784
KRATIE, 2 (OD)	1	2	6	7	22	16	32	16	23	20	31	14	35	22	150	97	247
KOMPONG CHAM, 10 (OD)	6	18	84	95	182	143	235	180	228	215	169	188	213	144	1117	983	2,100
STUNG TRENG, 1 (OD)	0	0	6	6	15	13	24	11	13	12	17	15	19	12	94	69	163
PREAH VIHEAR, 1 (OD)	1	1	5	6	19	12	19	14	24	16	19	17	15	14	102	80	182
MODULKIRI,1(OD)	0	0	0	0	0	0	4	1	6	1	7	0	2	0	19	2	21
RATANAKIRI, 1 (OD)	1	1	2	3	8	3	15	13	19	2	10	4	7	8	62	34	96
24 PROVINCES	37	45	746	801	1,522	1,252	1,884	1,461	2,117	1,894	1,543	1,637	1,548	1,376	9,397	8,466	17,863

Table 4

TB Cases Notified by Operational District in 2009

<i>Operational District (OD)</i> of Province	AFB pos			AFB neg		EP	OTHER	TOTAL	
	New	Re	Fail.	RAD	ReTt				
KANDAL :									
TAKMOV (OD)	212	4	1	0	5	312	262	4	795
SAANG(OD)	257	10	0	0	10	27	70	5	369
KOH THOM(OD)	215	2	0	0	2	183	25	6	431
KIEN SVAY(OD)	239	3	0	0	3	70	432	4	748
KHSACH KANDAL(OD)	95	2	0	0	2	21	213	1	332
MOUK KAMPOL(OD)	73	3	0	0	3	28	175	4	283
PONHEA LEU(OD)	127	3	0	0	3	26	42	0	198
ANG SNOUL(OD)	250	2	0	0	2	17	46	5	320
subtotal	1,468	29	1	0	30	684	1,265	29	3,476
SVAY RIENG									
SVAY RIENG (OD)	550	26	0	0	26	392	463	145	1,576
ROMEAS HEK(OD)	152	1	0	0	1	159	120	36	468
CHIPOU (OD)	217	3	0	0	3	222	181	31	654
subtotal	919	30	0	0	30	773	764	212	2,698
NATIONAL HOSPITAL									
CENAT	289	31	24	6	61	194	378	66	988
IOM	19	0	0	0	0	0	0	0	19
MDM	4	0	3	0	3	12	21	0	40
HOPE HOSPITAL	47	7	3	0	10	48	96	24	225
NORODOM SIAHNOUK	56	7	0	0	7	59	111	8	241
PREAH KET MELEAH	9	0	0	0	0	21	99	0	129
NATIONAL PEDIATRIQUE	2	0	0	0	0	94	80	0	176
subtotal	426	45	30	6	81	428	785	98	1,818
PHNOM PENH									
CENTER (OD)	73	0	0	0	0	48	57	1	179
NORTH(OD)	151	8	0	0	8	98	84	5	346
SOUTH(OD)	186	8	0	0	8	187	200	13	594
WEST(OD)	199	7	1	0	8	56	94	2	359
subtotal	609	23	1	0	24	389	435	21	1,478
PURSAT									
SAMPOVMEAS (OD)	398	22	0	0	22	153	343	16	932
BAKAN (OD)	161	2	0	0	2	73	142	20	398
subtotal	559	24	0	0	24	226	485	36	1,330
BATTAMBANG									
BATTAMBANG (OD)	265	8	1	0	9	120	239	17	650
THMAR KOUL (OD)	156	3	0	0	3	86	73	3	321
MAUNG RUSSEY (OD)	163	5	3	0	8	80	191	13	455
SAMPOEV LONE (OD)	130	5	0	0	5	89	27	2	253
SANG KE (OD)	110	1	1	0	2	50	40	0	202
subtotal	824	22	5	0	27	425	570	35	1,881
PAILIN CITY									
PAILIN (OD)	72	2	0	0	2	27	139	8	248

Table 4 (continued)

TB Cases Notified by Operational District in 2009

<i>Operational District (OD)</i> of Province	AFB pos			AFB neg		EP	OTHER	TOTAL	
	New	Re	Fail.	RAD	ReTt				
BANTEAY MEANCHEY:									
MONGKOL BOREI (OD)	253	5	0	0	5	256	240	38	792
PREANEATPREAS (OD)	217	2	0	0	2	182	78	43	522
OCHROV (OD)	280	5	0	0	5	180	77	15	557
TMORPOUK(OD)	206	5	0	0	5	68	39	4	322
subtotal	956	17	0	0	17	686	434	100	2,193
SIEM REAP									
SIEM REAP (OD)	504	8	3	0	11	266	329	17	1,127
SOTNIKUM(OD)	432	10	2	0	12	141	110	15	710
ANGKOR CHUM	306	4	0	0	4	371	200	17	898
KRALANH (OD)	238	7	0	0	7	244	261	7	757
subtotal	1,480	29	5	0	34	1,022	900	56	3,492
ODOR MEANCHEY									
SAMRONG (OD)	328	3	0	0	3	65	84	13	493
KOMPONG THOM									
KG THOM (OD)	447	5	0	0	5	168	116	6	742
BARAY (OD)	411	4	0	0	4	36	54	2	507
STUNG(OD)	218	1	0	0	1	35	36	5	295
subtotal	1,076	10	0	0	10	239	206	13	1,544
TAKEO									
DAUNKEOV (OD)	367	0	0	0	0	115	285	0	767
BATI (OD)	242	7	0	0	7	152	81	36	518
PREY KABAS (OD)	493	4	0	0	4	216	216	44	973
ANGROKA (OD)	108	6	0	0	6	146	85	9	354
KIRIVONG (OD)	231	9	0	0	9	32	136	4	412
subtotal	1,441	26	0	0	26	661	803	93	3,024
KOMPONG SPEU									
KOMPONG SPEU (OD)	638	26	2	0	28	72	246	8	992
KARNG PISEY(OD)	377	7	0	0	7	139	121	17	661
LOUDONG(OD)	181	1	0	0	1	74	124	3	383
subtotal	1,196	34	2	0	36	285	491	28	2,036
KAMPOT									
KAMPOT (OD)	215	2	0	0	2	40	81	0	338
ANGKOR CHEY(OD)	175	6	0	0	6	60	56	5	302
KOMPONG TRACH(OD)	198	9	0	0	9	54	89	5	355
CHHOUK(OD)	213	10	0	0	10	76	179	51	529
subtotal	801	27	0	0	27	230	405	61	1,524
KEP									
KRONG KEP (OD)	31	0	0	0	0	9	28	0	68
KOMPONG SOM									
PREASIHANOUK(OD)	161	1	0	0	1	115	160	7	444

Table 4 (continued)

TB Cases Notified by Operational District in 2009

<i>Operational District (OD)</i> of Province	AFB pos			AFB neg		EP	OTHER	TOTAL	
	New	Re	Fail.	RAD	ReTt				
KOH KONG									
SMUCH MEANCHEY(OD)	65	0	0	0	0	21	30	0	116
SRE AMBIL(OD)	39	0	0	1	1	9	12	6	67
subtotal	104	0	0	1	1	30	42	6	183
PREY VENG									
PREY VENG (OD)	422	25	0	0	25	148	265	4	864
KAMCHEY MEAR(OD)	193	4	0	0	4	102	238	0	537
PEARING(OD)	239	4	1	0	5	220	207	16	687
KG TRABECK(OD)	138	0	0	0	0	46	33	3	220
subtotal	1,480	29	5	0	34	1,022	900	56	3,492
KOMPONG CHHNANG									
KG. CHHNANG (OD)	346	12	0	1	13	20	92	2	473
KG TRALACH (OD)	264	7	0	0	7	75	70	0	416
Bar Bo (OD)	174	0	0	0	0	31	97	0	302
subtotal	784	19	0	1	20	126	259	2	1,191
KRATIE									
KRATIE (OD)	179	3	0	0	3	67	139	0	388
CHHLAUNG(OD)	68	0	0	0	0	15	32	1	116
subtotal	247	3	0	0	3	82	171	1	504
KOMPONG CHAM									
KG CHAM (OD)	278	6	4	3	13	109	179	22	601
KRAUCH CHMAR (OD)	116	1	0	0	1	46	49	1	213
TBONG KHMUM(OD)	186	2	0	1	3	112	104	0	405
CHOEUNG PREY(OD)	342	7	0	0	7	313	714	18	1,394
SREY SANTHOR(OD)	168	4	2	0	6	81	39	9	303
CHAMCAR LEU(OD)	419	0	0	0	0	38	246	0	703
PREY CHHOR (OD)	158	2	0	0	2	26	74	2	262
PONHEA KREK(OD)	201	6	2	0	8	123	201	1	534
ORAING OV(OD)	118	5	0	0	5	52	100	2	277
MEMOT(OD)	114	1	0	0	1	20	42	4	181
subtotal	2,100	34	8	4	46	920	1,748	59	4,873
STUNG TRENG									
STUNG TRENG (OD)	163	0	0	0	0	12	81	0	256
PREAH VIHEAR									
TBENG MEAN CHEY(OD)	182	1	1	0	2	49	65	1	299
MONDOLKIRI									
SEN MONORUM(OD)	21	0	0	0	0	12	15	0	48
RATTANAKIRI									
BANLUNG (OD)	96	2	3	0	5	11	18	2	132
TOTAL	17,863	432	57	12	501	8,378	12,529	928	40,199

Table 5

Treatment Outcomes of New Smear Positive TB Cases by Operational District in 2009

<i>Operational District (OD) of Province</i>	patients	Cure	%	Complete	%	Death	%	Failure	%	default	%	Trans	%
KANDAL :													
TAKMOV (OD)	230	223	97%	0	0%	3	1%	0	0%	0	0%	4	2%
SAANG(OD)	345	342	99%	0	0%	1	0%	0	0%	2	1%	0	0%
KOH THOM(OD)	243	237	98%	0	0%	3	1%	0	0%	1	0%	2	1%
KIEN SVAY(OD)	338	325	96%	4	1%	7	2%	0	0%	1	0%	1	0%
KHSACH KANDAL(OD)	105	98	93%	6	6%	1	1%	0	0%	0	0%	0	0%
MOUK KAMPOL(OD)	96	85	89%	4	4%	4	4%	0	0%	0	0%	3	3%
PONHEA LEU(OD)	119	113	95%	1	1%	2	2%	0	0%	2	2%	1	1%
ANG SNOUL(OD)	293	290	99%	0	0%	2	1%	0	0%	1	0%	0	0%
subtotal	1,769	1,713	97%	15	1%	23	1%	0	0%	7	0%	11	1%
SVAY RIENG													
SVAY RIENG (OD)	653	617	94%	3	0%	20	3%	0	0%	6	1%	7	1%
ROMEAS HEK(OD)	177	168	95%	0	0%	7	4%	0	0%	0	0%	2	1%
CHIPOU (OD)	276	268	97%	2	1%	5	2%	0	0%	0	0%	1	0%
subtotal	1,106	1,053	95%	5	0%	32	3%	0	0%	6	1%	10	1%
NATIONAL HOSPITAL													
CENAT	259	197	76%	2	1%	9	3%	2	1%	16	6%	33	13%
HOPE HOSPITAL	48	32	67%	0	0%	3	6%	1	2%	8	17%	4	8%
IOM	64	59	92%	0	0%	0	0%	0	0%	4	6%	1	2%
NORODOM SIAHNOUK	96	35	36%	39	41%	6	6%	0	0%	5	5%	11	11%
PREAH KET MELEAH	21	21	100%	0	0%	0	0%	0	0%	0	0%	0	0%
NATIONA PEDIATRIQUE	2	2	100%	0	0%	0	0%	0	0%	0	0%	0	0%
subtotal	490	346	71%	41	8%	18	4%	3	1%	33	7%	49	10%
PHNOM PENH													
CENTER (OD)	51	42	82%	1	2%	0	0%	1	2%	3	6%	4	8%
NORTH(OD)	127	122	96%	0	0%	4	3%	0	0%	0	0%	1	1%
SOUTH(OD)	136	114	84%	7	5%	3	2%	0	0%	3	2%	9	7%
WEST(OD)	234	214	91%	12	5%	0	0%	0	0%	3	1%	5	2%
subtotal	548	492	90%	20	4%	7	1%	1	0%	9	2%	19	3%
PURSAT													
SAMPOVMEAS (OD)	400	376	94%	6	2%	11	3%	0	0%	2	1%	5	1%
BAKAN (OD)	218	204	94%	2	1%	8	4%	0	0%	3	1%	1	0%
subtotal	618	580	94%	8	1%	19	3%	0	0%	5	1%	6	1%
BATTAMBANG													
BATTAMBANG (OD)	298	260	87%	17	6%	7	2%	0	0%	7	2%	7	2%
THMAR KOUL (OD)	199	184	92%	0	0%	10	5%	1	1%	2	1%	2	1%
MAUNG RUSSEY (OD)	180	166	92%	3	2%	6	3%	0	0%	3	2%	2	1%
SANG KE (OD)	150	135	90%	2	1%	8	5%	1	1%	1	1%	3	2%
SAMPOVLOUN (OD)	133	113	85%	5	4%	1	1%	0	0%	3	2%	11	8%
subtotal	960	858	89%	27	3%	32	3%	2	0%	16	2%	25	3%
PAILIN CITY													
PAILIN (OD)	55	42	76%	3	5%	1	2%	0	0%	6	11%	3	5%

Table 5 (continued)

Treatment Outcomes of New Smear Positive TB Cases by Operational District in 2009

Operational District (OD) of Province	patients	Cure	%	Complete	%	Death	%	Failure	%	default	%	Trans	%
BANTEAY MEANCHEY													
MONGKOL BOREI (OD)	268	238	89%	2	1%	8	3%	1	0%	4	1%	15	6%
PREANEATPREAS (OD)	232	223	96%	5	2%	4	2%	0	0%	0	0%	0	0%
OCHROV (OD)	231	202	87%	3	1%	8	3%	1	0%	5	2%	12	5%
TMORPOUK(OD)	195	166	85%	9	5%	12	6%	0	0%	5	3%	3	2%
subtotal	926	829	90%	19	2%	32	3%	2	0%	14	2%	30	3%
SIEM REAP													
SIEM REAP (OD)	463	375	81%	4	1%	19	4%	0	0%	7	2%	58	13%
ANGKOR CHUM	339	313	92%	9	3%	13	4%	0	0%	2	1%	2	1%
SOTNIKUM(OD)	381	341	90%	20	5%	11	3%	1	0%	4	1%	4	1%
KRALANH (OD)	275	263	96%	1	0%	10	4%	0	0%	1	0%	0	0%
subtotal	1,458	1,292	89%	34	2%	53	4%	1	0%	14	1%	64	4%
ODOR MEANCHEY													
SAMRONG (OD)	304	269	88%	29	10%	3	1%	0	0%	0	0%	3	1%
KOMPONG THOM													
KG THOM (OD)	528	513	97%	0	0%	11	2%	0	0%	1	0%	3	1%
BARAY (OD)	529	503	95%	11	2%	12	2%	0	0%	2	0%	1	0%
STUNG(OD)	249	244	98%	3	1%	2	1%	0	0%	0	0%	0	0%
subtotal	1,306	1,260	96%	14	1%	25	2%	0	0%	3	0%	4	0%
TAKEO													
DAUNKEOV (OD)	462	393	85%	17	4%	24	5%	0	0%	1	0%	27	6%
BATI (OD)	238	209	88%	25	11%	0	0%	1	0%	1	0%	2	1%
PREY KABAS (OD)	515	497	97%	0	0%	6	1%	0	0%	2	0%	10	2%
ANGROKA (OD)	127	119	94%	0	0%	3	2%	2	2%	1	1%	2	2%
KIRIVONG (OD)	277	252	91%	8	3%	10	4%	3	1%	3	1%	1	0%
subtotal	1,619	1,470	91%	50	3%	43	3%	6	0%	8	0%	42	3%
KOMPONG SPEU													
KOMPONG SPEU (OD)	728	658	90%	17	2%	15	2%	0	0%	11	2%	27	4%
KARNG PISEY(OD)	400	360	90%	19	5%	13	3%	0	0%	5	1%	3	1%
LOUDONG(OD)	191	168	88%	14	7%	4	2%	0	0%	1	1%	4	2%
subtotal	1,319	1,186	90%	50	4%	32	2%	0	0%	17	1%	34	3%
KAMPOT													
KAMPOT (OD)	240	233	1	0	0	5	0	0	0	0	0	2	0
ANGKOR CHEY(OD)	212	204	96%	0	0%	5	2%	0	0%	1	0%	2	1%
KOMPONG TRACH(OD)	206	204	99%	0	0%	2	1%	0	0%	0	0%	0	0%
CHHOUK(OD)	279	271	97%	0	0%	6	2%	0	0%	1	0%	1	0%
subtotal	937	912	97%	0	0%	18	2%	0	0%	2	0%	5	1%
KEP													
KRONG KEP (OD)	26	22	85%	3	12%	0	0%	0	0%	0	0%	1	4%
KOMPONG SOM													
PREASIHANOUK(OD)	178	153	86%	8	4%	10	6%	1	1%	3	2%	3	2%

Table 5 (continued)

Treatment Outcomes of New Smear Positive TB Cases by Operational District in 2009

Operational District (OD) of Province	patients	Cure	%	Complete	%	Death	%	Failure	%	default	%	Trans	%
KOH KONG													
SMUCH MEANCHEY(OD)	58	48	83%	0	0%	1	2%	1	2%	5	9%	3	5%
SRE AMBIL(OD)	45	40	89%	2	4%	0	0%	0	0%	3	7%	0	0%
subtotal	103	88	85%	2	2%	1	1%	1	1%	8	8%	3	3%
PREY VENG													
PREY VENG (OD)	531	506	95%	8	2%	14	3%	0	0%	0	0%	3	1%
KAMCHEY MEAR(OD)	308	298	97%	6	2%	2	1%	0	0%	1	0%	1	0%
PEARING(OD)	360	347	96%	4	1%	5	1%	0	0%	3	1%	1	0%
KG TRABECK(OD)	196	184	94%	9	5%	3	2%	0	0%	0	0%	0	0%
MESANG(OD)	284	272	96%	4	1%	7	2%	0	0%	0	0%	1	0%
PREAH SDACH(OD)	248	244	98%	4	2%	0	0%	0	0%	0	0%	0	0%
NEAK LOEUNG (OD)	433	395	91%	30	7%	3	1%	0	0%	0	0%	5	1%
subtotal	2,360	2,246	95%	65	3%	34	1%	0	0%	4	0%	11	0%
KOMPONG CHHNANG													
KG. CHHNANG (OD)	391	349	89%	15	4%	20	5%	0	0%	2	1%	5	1%
BARBO (OD)	200	195	98%	0	0%	4	2%	0	0%	0	0%	1	1%
KG TRALACH (OD)	222	215	97%	1	0%	4	2%	1	0%	0	0%	1	0%
subtotal	813	759	93%	16	0	28	0	1	0	2	0	7	0
KRATIE													
KRATIE (OD)	215	187	87%	17	8%	4	2%	0	0%	4	2%	3	1%
CHHLAUNG(OD)	107	92	86%	4	4%	4	4%	1	1%	3	3%	3	3%
subtotal	322	279	87%	21	7%	8	2%	1	0%	7	2%	6	2%
KOMPONG CHAM													
KG CHAM (OD)	245	205	84%	16	7%	13	5%	0	0%	4	2%	7	3%
KRAUCH CHMAR (OD)	90	85	94%	1	1%	4	4%	0	0%	0	0%	0	0%
TBONG KHMUM(OD)	142	90	63%	36	25%	2	1%	0	0%	5	4%	9	6%
CHOEUNG PREY(OD)	394	376	95%	0	0%	12	3%	0	0%	5	1%	1	0%
SREY SANTHOR(OD)	204	194	95%	4	2%	2	1%	0	0%	3	1%	1	0%
CHAMCAR LEU(OD)	539	525	97%	11	2%	2	0%	0	0%	1	0%	0	0%
PREY CHHOR (OD)	142	138	97%	0	0%	4	3%	0	0%	0	0%	0	0%
PONHEA KREK(OD)	168	156	93%	4	2%	3	2%	2	1%	1	1%	2	1%
ORAING OV(OD)	123	103	84%	15	12%	2	2%	0	0%	3	2%	0	0%
MEMOT(OD)	109	100	84%	1	0%	1	5%	0	1%	3	4%	4	6%
subtotal	2,156	1,972	91%	88	4%	45	2%	2	0%	25	1%	24	1%
STUNG TRENG													
STUNG TRENG (OD)	145	133	92%	1	1%	6	4%	1	1%	1	1%	3	2%
PREAH VIHEAR													
TBENG MEAN CHEY(OD)	205	187	91%	12	6%	5	2%	0	0%	0	0%	1	0%
MONDOLKIRI													
SEN MONORUM(OD)	17	11	65%	5	29%	1	6%	0	0%	0	0%	0	0%
RATTANAKIRI													
BANLUNG (OD)	71	55	77%	9	13%	3	4%	1	1%	1	1%	2	3%
TOTAL	19,811	18,207	92%	545	3%	479	2%	23	0%	191	1%	366	2%

XVII. Acknowledgement

Impressive achievements obtained by the National TB Program, regarding especially maintaining the high cure rate of tuberculosis of more than 85 %, 100 % DOTS coverage as planned, and the case detection rate of new smear positive has been reached 62% in 2009, have been associated with the support from the Royal Government of Cambodia as well as the Ministry of Health who have given high priority to TB Control. These achievements have also related to active participation of all health workers throughout the country together with the support and collaboration from various other partners including local authorities, community and financial and technical partners encompassing International and Non Governmental Organizations.

The National Tuberculosis Control Program would like to express deep thanks to:

- The Royal Government of Cambodia and the Ministry of Health for all the supports,
- All health workers in particular TB related people across the country for their active participation,
- International and Non Governmental Organizations for technical and financial assistance to the TB program,
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