

Mobilization Plan to Reduce Tuberculosis by Half in Ten Years

Approved by the Executive Yuan on July 7, 2006, under Yuan-Tai-Wei No
0950031290.

Department of Health, Executive Yuan, R.O.C. (Taiwan)
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Department of Health, Executive Yuan, R.O.C.(Taiwan)
Address:No.100, Aiguo E. Rd., Jhongjheng District, Taipei City 10092, Taiwan
(R.O.C.)
Tel: 886-2-2321-0151
Web Site:<http://www.doh.gov.tw/EN/Webpage/index.aspx>

Center for Disease Control, R.O.C. (Taiwan)
Address: No.6, Linshen S. Rd., Taipei, Taiwan 10050, R.O.C.
Tel: 886-2-2395-9825.
Web Site: <http://www.cdc.gov.tw/en/index.asp>

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Chapter 1. General Principles

1. Origin of the Plan

Tuberculosis has always been a serious communicable disease in Taiwan. At a time when the per capita GNP has reached a level of US\$ 13,000, some 15,000 new cases of tuberculosis are detected each year. The severity of the infection is greater than the sum of all communicable diseases combined.

Tuberculosis not only endangers the health of the population and wears out social productivity, it also seriously affects national competitiveness and international image. Taiwan has promoted tuberculosis control for more than a half century. Through the years-long contributions of the tuberculosis workers, a large part of the disease has been brought under control. However, there still exists a gap of some ten years as compared to the development in the advanced countries. There are still rooms for improvement, and we must proceed with determination.

Taiwan is a small island with a large population of high density and mobility. The rapid development of the society has resulted in estranged interpersonal relationship, and in the universal distribution of medical care resources allowing people to seek medical care at will. The detection and management of cases under such circumstances are more difficult than that of the agricultural society. In the recent years, tuberculosis seems to re-emerge. Tuberculosis control in Taiwan has, due to factors such as the increasing number of tourists, importation of alien labor, more frequent international exchanges, and more cases of AIDS complicated with tuberculosis, faced high challenges, and more positive and active intervention measures will have to be taken to breakthrough the bottlenecks of control programs to protect the health of the people.

In 1994, the Executive Yuan approved the Intensive Control of Tuberculosis five-year plan. In 1999, the Executive Yuan again approved the implementation of the Second-Phase Intensive Control of Tuberculosis five-year plan for a period until 2003. In 2004, the Executive Yuan again approved the implementation of the Third-Phase Intensive Control of Tuberculosis five-year plan. This Mobilization Plan to Reduce Tuberculosis by Half in Ten Years is formulated by considering the current status of tuberculosis infection, assessing the effects of the past efforts, and realizing that there are each year more than nine million infections and two million deaths of tuberculosis throughout the world, to link with the international community by coordinating with the Global Plan to Stop TB 2006-2015 advocated by the world renowned Stop TB Partnership group.

2. Legal Basis

The Communicable Disease Control Act amended and announced on January 20, 2004, under Hua-Tsung-Yi-Yi Order No. 09300010081.

3. Monitoring of Future Environment

1) Current Status and Trend of Tuberculosis Infection Worldwide

Tuberculosis is a droplet-transmitted communicable disease caused by *Mycobacterium*

tuberculosis. For short of effective medicines to cure in the past, a half of the patients would die, and a quarter would become chronic sources of infection; the disease was considered incurable. Since 1944, medicines for tuberculosis have appeared one by one, and the control of tuberculosis in all countries has made significant progress. However, since the 1980s, for reasons such as inadequate control programs, the emerging of multi-drug resistance of tuberculosis, the spread of AIDS, and the rapid movement of the world population, the world is facing the re-emergence of tuberculosis. The World Health Organization (WHO), realizing the increasing seriousness of tuberculosis infection, announced in 1993 tuberculosis as a “global emergency risk”, urging countries to focus more on the prevention and control of tuberculosis to strictly counterattack the infection.

At present, tuberculosis is the communicable disease that causes many deaths throughout the world by a single pathogenic agent. By the WHO statistics, globally, one person is newly infected by tuberculosis every second; and each year, around 1% of the world population is infected; giving a total of some 2 billion infected people worldwide, accounting for one-third of the world population. Of those infected, there are 10% chances of developing tuberculosis throughout their life. Each year, there are some 9 million new patients, and the total number of patients at present is 16.20 million. The number of tuberculosis patients accounts for 2.5% of all patients worldwide. By the number of patients, the South-east Asia is the most serious area of all, adding each year some 3 million new patients. Globally, some 3 million people die of tuberculosis each year, and the number of tuberculosis deaths accounts for 26% of all “preventable deaths.”

In developing countries, the threat of tuberculosis is more serious. The number of tuberculosis patients in developing countries accounts for 95% of all tuberculosis patients worldwide; and the number of tuberculosis deaths accounts for 99% of all tuberculosis deaths. Tuberculosis has highly exhausted social and economic vitality. In developing countries, 75% of tuberculosis patients are in the productive age groups of 15 to 54 years; they have lost on average three to four months working time each year because of the infection; and the annual family income has decreased by 20-30%. A tuberculosis death will on average result in 15 years of income loss. Tuberculosis has also induced a chain of social problems. In India each year, some 300,000 children are deprived of education because their parents are tuberculosis-infected; and some 100,000 women are, for being infected with tuberculosis, abandoned by their families.

The WHO estimate is that in the year 2000, there were 9.74 million new tuberculosis patients throughout the world (giving an incidence of 144 persons per 100,000 population). In that year, member states altogether reported 3.67 million new cases (giving an incidence of 61 per 100,000), at a detection rate of 42%. The number of new sputum-positive cases was estimated to be 3.84 million (incidence of 63 per 100,000); while the number reported by the member states was 1.53 million (incidence of 25 per 100,000), at a detection rate of 40%.

The number of newly detected tuberculosis cases is still on the rise. It is estimated that by the year 2005, the number will exceed 10 million. If the infection is not effectively controlled, the estimate is that in the period between 2000 and 2020, some one billion people will be newly infected with tuberculosis; 200 million of them will develop tuberculosis; and 35 million of them will have died.

2) Current Status and Trend of Tuberculosis Infection in Taiwan

(1) Incidence

In 2004, a total of 24,161 cases of tuberculosis had been reported; of them, 16,784 were confirmed new tuberculosis cases through diagnosis, giving an incidence of 74.11 per 100,000

population. In the 38 reportable communicable diseases, tuberculosis cases accounted for 70%, the largest number of patients in all reportable communicable diseases thus far. On average, a case is detected every 36 minutes. In the period between January 1 and December 31, 2005, the number of tuberculosis cases under management throughout the country was 16,227.

Though registration of tuberculosis patients began in 1957, registration then was required only of sputum-positive open cases. Later, the registration was extended, and in 1991, all active tuberculosis cases were required to be reported and registered, though the reporting by medical care institutions was inadequate, and the number of new cases registered failed to reflect the actual situation. In July 1997, the Bureau of National Health Insurance implemented a policy of “no reporting, no payment” against tuberculosis; and in 2001, the Center for Disease Control of the Department of Health (CDC) initiated a “death checking” of reported tuberculosis death cases, the reporting by medical care institutions had suddenly increased, and the discrepancy between the epidemic statistics and the actual situation had gradually been narrowed down.

In 2004, of the 16,784 new tuberculosis cases, 90% were pulmonary tuberculosis. By sex, male tuberculosis patients were 2.6 times more than that of the females; and the incidence was 2.2 times higher. By age, incidence of tuberculosis increased significantly by age. Of the newly detected cases, 50.3% were the elderly 65 years and above.

By county and city, more cases concentrated in cities. In 2004, the number of newly detected cases in four major cities and counties accounted for 37.23% of all cases in the Taiwan Area; 2,323 cases in Taipei County (13.85%), 1,435 in Taipei City (8.55%), 1,286 in Kaohsiung City (7.66%), and 1,216 in Kaohsiung County (7.24%). Incidence is higher in the eastern part of Taiwan than in the western part; higher in the southern area than in the northern area. In 2004, Hualien County had the highest incidence of 160.79 per 100,000; incidence in Taitung and Pingtung counties all exceeded 100 per 100,000. Incidence in mountain areas was 270.20 per 100,000; which was 3.8 times higher than the 72.35 per 100,000 incidence of other areas.

(2) Infection Rate

Practically all infants and children in the Taiwan Area have been vaccinated BCG, it is not possible to understand the exact rate of tuberculosis infection. The first-graders of primary school who have not yet been vaccinated BCG are therefore skin-tested with tuberculin; and infection rate is estimated by their positive reaction. The immunization coverage of BCG in the recent years has been as high as 98%, the size of samples for testing has become smaller by year and is not representative; the estimation of infection rate has become more difficult.

Survey in 2004 showed that of the 2,593 schoolchildren without BCG scars (1.06% of scar-less rate, or a coverage rate of 98%), the tuberculin skin test positive rate was 7.02%; the infection rate was estimated to be 1.11% (PPD RT23 2TU).

(3) Mortality Rate

Mortality rate of tuberculosis in 2004 in the Taiwan Area was 4.23 per 100,000, or 957 deaths, accounting for 0.72% of all deaths, and was the 13th of the causes of death. In the past years, tuberculosis mortality had declined by 98.6% in the 56 years between 1947 and 2004; it had declined by 53.2% in the 13 years between 1991 and 2004. The number of deaths accounted for more than 80% of deaths of all reportable communicable diseases.

In all tuberculosis deaths in 2004, 92.7% were deaths from pulmonary tuberculosis; the rest 7.3% were deaths from tuberculosis of organs other than lungs. By sex, males had 3.4 times

more tuberculosis deaths than females; and 3.3 times higher mortality rate. The trend is that, tuberculosis deaths in males are becoming higher than that of the females (see Figure on Trend). By age, tuberculosis mortality increases by age. Of the 957 deaths, 79% were the elderly of 65 and above, indicating that tuberculosis deaths in the Taiwan Area concentrate primarily in the elderly population.

By counties and cities, tuberculosis mortality is parallel to incidence, higher in the eastern part than in the western part; higher in the southern area than in the northern area; and lower in cities. In 1994, Taitung County had the highest mortality rate of 11.04 per 100,000; Pingtung and Hualien counties came the next. In mountain areas, the mortality was 25.02 per 100,000; six times higher than that in other areas (4.04 per 100,000).

Internationally, Taiwan detects about 15,000 new tuberculosis cases each year, and the number of deaths is around 1,300. Taiwan has an incidence 13 times higher than that of the US (66.67/5.1); and 2.7 times higher than that of Japan (66.67/24.8). Reduction in the incidence of tuberculosis is a priority in the control of tuberculosis in Taiwan.

4. Current Status, Problems and Challenges

In the past, control measures were taken only after the tuberculosis cases were reported and diagnosis confirmed by physicians. It took as long as on average 44 days from case reporting to registration for management by disease control units. To activate earlier the disease control mechanism, the CDC promoted a policy to report all suspects; and once reported, to register them for management. Together with monthly quality monitoring, time required for reporting had been reduced from 44 days in the past to only two; and unusual rate in reporting time had been reduced from 10% in 2002 to less than 1% in July 2005.

To stress the importance of sputum-testing, a testing on contract network has been established throughout the island. Through routine monthly quality monitoring measures, the initial sputum-testing of cases has reached more than 95%.

To strengthen case management, the CDC prepares each month a lost-to-contact list by county and city for the reference of counties and cities in improving their performance. Through the efforts of primary care workers, the lost-to-contact rates have seen significant improvement in the recent years. The 12-month lost-to-contact rate of cases in 2004, when compared with that of the same period in 2002, had declined from 25.5% to 11.2% (by 56.3%); the 18-month lost-to-contact rate in 2004, when compared with that of the same period in 2002, had declined from 6.9% to 3.8% (by 45.3%). The age-specific standardized cure rates in the second-phase five-year plan (1999-2003) and the third-phase five-year plan (2004-2005) though were as high as 84.66% and 91.6% respectively, for being a chronic communicable disease distinctly different from other communicable diseases, the control of tuberculosis is unlikely to see instant results. Although 90% of the cases have been cured, the 10% open cases that are not detected and not cured either, may possibly cancel out all efforts of medical and public health intervention. The new cases detected each year and the cases placed under management each year are the same; and this is the dilemma in Taiwan's tuberculosis control. To link with the international community, and in coordination with the Global Plan to Stop TB 2006-2015 advocated by the world-renowned Stop TB Partnership group to check and to start turning around the growth of tuberculosis incidence by 2015, Taiwan is determined to take more active and effective measures to control tuberculosis.

1) Long incubation period makes confirmation diagnosis difficult.

(1) In the past, more than 70% of tuberculosis patients were detected and cared by

tuberculosis responsibility medical care institutions. Since the inception of the National Health Insurance, more medical care resources have become available and accessible, tuberculosis patients visit general medical care institutions for treatment. The higher accessibility to medical care certainly is helpful to the early detection of diseases and makes medical care more convenient. However, in the interim, there are bound to have problems such as the uneven quality of medical care institutions, a higher rate of changes in diagnosis, care of difficult cases and their referral, nosocomial infection, development of professional manpower, and coordination between the medical care systems and the public health systems.

(2) Symptoms of the primary infection are atypical; symptoms such as fever, coughing and loss of weight are not distinct; and tuberculosis bacilli may not be detected in sputum, erroneous diagnosis is likely, which has some impact on the management of patients.

2) Longer process of treatment makes patients overlook physician's order.

(1) The process of treatment is long, one course takes about six months; different kinds of medicines are taken together at the same time, and there may be side reactions. During the course, the confidence and will-power of the patient are likely to affect the effectiveness of cure.

(2) For a long process of treatment, many factors that involve the patient, such as the psychology, physiology, family, friends, the society, and the employment are closely related to the management of patient. Inadequate handling of one link is likely to have impact on the success or failure of management. In particular, in the Taiwan society, tuberculosis is stereotyped as a disease of shame, and patients are often unfairly isolated, rejected, deprived of education and employment. All these make disease control more difficult.

3) Multi drug-resistance is a problem.

The multi drug-resistance in the primary tuberculosis cases has increased from 0.2% in the 1990s to current 2.1%, ten-fold increase in ten years. If the problem is not improved soon, effective medicines for tuberculosis will become less available, and the cure of tuberculosis will become more difficult. This is a severe challenge faced by Taiwan and the world as well in the control of tuberculosis.

4) Problems associated with sputum-testing in laboratories

(1) Surveys show that about 29% of the district and above hospitals in Taiwan have not done by themselves or commissioned out swab testing of sputum.

(2) Many laboratories, after swabbing, are unable to conduct follow-up testing of culturing, assessment and drug-resistance testing.

(3) The quality of swab is inadequate.

5) Primary care manpower is insufficient.

(1) Insufficiency of manpower is also a problem. Care and management of patients require professional manpower of certain backgrounds. At present, patients are managed by public health nurses of health stations. The purpose of the DOTS (directly observed treatment, short-course) is to make patients take medicines regularly under concern and supervision. Public health nurses of health stations are often overloaded with work of all kinds, they, under most circumstances, will telephone patients to urge them to take medicine on time. Not all patients are cooperative and follow the urge. The management of patients is therefore difficult; it is a heavy burden and also a challenge of the primary care workers.

(2) Some specific features of tuberculosis cases also pose certain challenge. A larger portion

of the tuberculosis cases are vagrants without regular residence, indigenous people, or the poor living alone. Their management often requires more time and efforts.

6) Problems associated with the elderly and residents of the mountain areas.

Both the mortality and incidence of tuberculosis, generally speaking, are high among the elderly (74/48.9%). Incidence among the indigenous peoples (3.7) is 3.1 times higher than the Taiwan Area average; their mortality (6.0) is 3.1 times higher. The elderly and the indigenous peoples are the priority targets for tuberculosis control.

7) Control of nosocomial and herd infections

Many incidents of tuberculosis infection have been reported by mass media. Through laboratory diagnosis, however, only a few cases have been confirmed nosocomial infection in some hospitals. Nosocomial infection is associated with many factors; it has, however, serious impact on the medical care system and the health of the population. The stereotyped concept of the public toward tuberculosis makes them discriminate against tuberculosis patients. This, in turn, makes tuberculosis patients feel inferior, reluctant to seek medical care at the prime time, and may even spread the disease to many others. The herd infection in community often causes panic in the public. They all indicate that a close coordination between the medical care and the public health systems, and the development of professional manpower are the key to the effective control of tuberculosis.

8) Problems associated with case detection and management

Taiwan is a small island with a large population of high density and mobility. The rapid development of the society has resulted in estranged interpersonal relationship, and in the universal distribution of medical care resources allowing people to seek medical care at will. The detection and management of patients under such circumstances are more difficult than that of the agricultural society. Furthermore, the quality of sputum-testing by laboratories is uneven, mobilization of community resources for control is not yet adequate, and the sources of infection are not yet effectively brought under control, tuberculosis is, under such circumstances, like to continue to spread around.

9) Problems of AIDS and alien labor

Tuberculosis is re-emerging worldwide. For factors such as the increasing number of tourists, the importation of alien labor, the frequent international contact, and the increasing number of AIDS patients complicated with tuberculosis, Taiwan's tuberculosis control is facing severe challenges. More positive intervention measures will have to be taken to breakthrough the bottlenecks of control to protect the health of the people.

5. Duration of Implementation

Ten years from January 1, 2006 through December 10, 2015 (in two phases from January 1, 2006 through December 31, 2010, and from January 1, 2011 through December 31, 2015).

6. Objectives

- 1) To detect earlier infected cases for early treatment and thus to eliminate sources of infection;
- 2) To provide the already-detected patients with sound medical care for prompt cure and thus to interrupt sources of infection; and

- 3) To prevent the un-infected from infection and thus to effectively control the transmission of tuberculosis.

7. Goals

- 1) The Goal

Find TB, Cure TB.

- 2) Indexes of Expected Outcomes

- (1) National Indexes

- i) Total index: From the beginning of the plan till the fifth year (2010), the incidence will be reduced to 52 per 100,000. In the 10th year (2015), the incidence will be further reduced to 34 per 100,000, and the age-specific standardized complete cure rate after case follow-up will be more than 90%.

- ii) Annual indexes:

Year	2006	2007	2008	2009	2010
Index					
Age-specific standardized complete cure rate (%)	91	91.5	92	92.5	93
18 month lost-to-contact rate after follow-up and cure (%)	1.65	1.6	1.5	1.4	1.3

- (2) Local Indexes

From the beginning of the plan till the fifth year (2010), incidence in a half of counties and cities will be reduced in half; in the 10th year (2015), incidence in all counties and cities will be reduced in half.

Chapter 2. Strategies, Implementation Methods and Organization

1. Re-formulating National Tuberculosis Program

1) Constructing a tuberculosis control system

(1) Establishment of basic management units (BMU);

(2) The concept of management by level.

2) A consensus will be reached. A set of standard operational procedures from reporting, diagnosis, treatment, laboratory testing, examination of contacts, case management and DOTS will be formulated.

3) A localized “Reduction of Tuberculosis by Half in Ten Years” plan will be promoted.

(1) Local resources will be integrated; local intelligence will be utilized.

(2) Annual management indexes by county and city will be formulated.

4) Coordination between public health network, laboratory testing network and medical care network will be strengthened.

2. Find TB

1) To strengthen disease reporting and monitoring

(1) To strengthen the functions of the tuberculosis patient databank

To maintain the normal functioning of the national tuberculosis patient databank; to collect and timely renew complete information of patients concerning diagnosis, reporting, registration, treatment, examination, management and conditions of contacts; to provide information needed for case management and epidemiological analysis.

(2) To establish a multi-functional Internet inquiry system on tuberculosis reporting

To encourage medical care institutions to directly report tuberculosis cases online; to increase number of reporting spots, and thus to improve efficiency of reporting; to regularly announce up-to-date epidemiological information; to provide real-time tabulation services to help health agencies and medical care institutions understand conditions of cases and local epidemiology.

(3) To realize tuberculosis reporting policies

i) To strengthen the promotion and to strictly enforce regulations of the Communicable Disease Control Act in connection with case reporting; to instruct local health bureaus to strengthen supervision of medical care institutions in the reporting by regulations of tuberculosis cases, and thus to improve case reporting rate; to regularly inspect medical care institutions on the interval between diagnosis and reporting, and thus to improve the timeliness of reporting and to realize the essence of the Communicable Disease Control Act.

ii) In coordination with the inclusion of tuberculosis medical costs in government budgets, to promote the “no reporting, no payment” policy; in collaboration with the Bureau of National Health Insurance, to link and check medical cost claims against the national tuberculosis patient databank.

iii) To conduct checking of tuberculosis death cases against the national tuberculosis patient databank.

(4) To strengthen the monitoring of tuberculosis of alien laborers (aliens)

- i) To regulate the quality of hospitals for the health examination of alien laborers; to spot-check them regularly and on unscheduled basis; to monitor the quality of the hospitals under contract with the CDC for the health examination of alien laborers.
- ii) To strengthen the monitoring of the active screening of alien laborers for tuberculosis; in coordination with the current practices of the CDC for the health examination of alien laborers, to conduct regular health examination of alien laborers within three days after entry, and 30 days before and after six months, 18 months and 30 months of employment.
- iii) To strengthen the monitoring of the passive screening of alien laborers for tuberculosis; chest x-ray films of the previous health examination will be consulted for cases under medical care; quality of hospitals will be monitored for improvement.
- iv) Disputable cases not confirmed diagnosis may be submitted to the tuberculosis diagnosis advisory groups of the branch bureaus of the CDC, or their medical records collected from physicians (medical care institutions) by health bureaus for review and discussion by the advisory group.

(5) To strengthen tuberculosis monitoring of special occupations and ethnic groups

Monitoring of tuberculosis will be focused on indigenous peoples, school teachers, students, medical personnel, military draftees, soldiers, jail inmates and densely populated institutions. Following regulations of the Procedures for the monitoring and control of communicable diseases in densely populated institutions and Manual for the control of tuberculosis prepared by the CDC, institutions will be required to strengthen health examination of inmates before admission and regular screening and monitoring of coughing of inmates. A certain part of the building should be kept unoccupied for temporary isolation care in case of herd infection. Institutions should also cooperate with the CDC to monitor and inspect fever cases following regulations of the CDC's Monitoring and inspection of fever in densely populated institutions, to strengthen the control of tuberculosis in densely populated institutions.

2) To Strengthen Case-Finding

(1) To improve active case-finding

i) In order to upgrade the quality of mobile x-ray screening and to fully utilize private-sector resources, digital x-ray mobile vans have been purchased. Medical care institutions of high quality have also been commissioned to conduct x-ray mobile screening in areas of relatively poor medical care resources, the mountain areas and offshore islands, correction institutions (including jails, detention centers, observation centers, etc.), nursing care institutions (including homes for veterans, nursing homes, homes for the disadvantaged, etc.), psychiatric hospitals, correction centers, close contacts of tuberculosis cases, and the high-risk groups of 40-years and above in high prevalence areas. In particular, lists of all indigenous peoples above the age of 12 years will be made for comprehensive chest x-ray screening.

ii) Long-time bed-ridden patients in nursing care institutions and hospitals and those relying on respirators for live-saving are, in most cases, the elderly or chronic patients with poor resistance to disease, they are the high-risk groups of tuberculosis. For difficulty in moving around, they have little access to x-ray screening. A pilot project of sputum-test all bed-ridden elderly in nursing care institutions and hospitals throughout the country has been formulated to prevent the transmission of the infection. Action will also be taken to promote infection control measures in the densely population institutions.

iii) Examination of contacts should consider disease control needs and cost-benefit at the

same time. Priority groups of contacts for examination will be decided by the communicability of patients and their possible range of transmission to improve the efficiency of examination.

- iv) Care institutions for high-risk groups will be encouraged to collaborate with tuberculosis care hospitals to set up a responsibility hospital system for screening.
- v) In coordination with regulations of the Labor Safety and Health Act, health examinations for workers will be improved, and the quality of special medical personnel upgraded. In collaboration with the Bureau of National Health Insurance, the quality of the current health examination for adults will be improved to actively detect tuberculosis cases in worksites and in the elderly.

(2) To improve passive case-finding

i) To prevent delay on the part of the patient

Health education will be strengthened to remind the public, when there are symptoms, to visit soon clinics for examination. A thorough, comprehensive care network for tuberculosis will be constructed to provide convenient access to high-quality medical care institutions for those requiring medical care.

ii) To improve delay on the part of physicians

Relevant workshops will be organized in collaboration with medical associations and local health bureaus to improve the alertness and capabilities of physicians in the diagnosis of tuberculosis. Through subsidies and the establishment of a testing of tuberculosis on contract network, facilities of medical care institutions for the diagnosis of tuberculosis will be upgraded.

iii) Hospitals will be strongly required to report cases (including deaths).

In collaboration with the National Health Insurance, the “no reporting, no payment” policy will be enforced. The linking and checking of medical cost claims against the tuberculosis patient databank will continue to be implemented to eliminate the blind angles of case-finding.

3) To establish a high-quality rapid testing network for tuberculosis bacilli

The testing of tuberculosis on contract network was established in October 2001. In the initial stage, focus is primarily placed on the selection of high-quality laboratories, the establishment of a network for the delivering of specimens, feedback of information, and the process of receiving and delivering specimens. The project will focus on the certification by level of laboratories on contract, upgrading and monitoring of the quality of laboratories, and manpower development.

(1) Constructing a contracted tuberculosis testing network

Laboratories of certain standard will be selected as contracted hospitals. Specimens for testing will be delivered by health stations. Medical care institutions may decide to join the network. The quality and standard of laboratory testing of hospitals in the region will be upgraded by using the contracted hospitals as the backbone.

i) Selecting contracted laboratories for the testing of tuberculosis bacilli

High-quality and recognized tuberculosis bacilli laboratories will be selected by region to serve as contracted laboratories to provide to the neighboring counties and cities a set of

comprehensive testing for tuberculosis bacilli (including sputum smear testing for anti-acid bacilli, culture testing of tuberculosis bacilli, and for positive cases, additional assessment and drug sensitivity test). Contracted laboratories will serve as simulated laboratories. Hospitals will have access to convenient and high-quality testing services without having to set up their own laboratories; and the goal of each pulmonary tuberculosis patient having access to sputum smear testing, culture testing, and for positive cases, additional assessment and drug sensitivity testing can be attained.

ii) Setting up more and convenient spots for sputum collection

In each township, a sputum collection spot will be set up. Specimens in the area will be collected and sent to the contracted laboratories to make sputum testing more convenient to the public, and at the same time, to save costs on collection. In the initial stage of the pilot project, sputum collection spot will be set up at the health station, and medical care institutions without adequate sputum testing facilities may deliver their sputum specimens for testing. The goal of sputum testing at the time of medical care at medical care institutions will be reached in the future.

iii) Setting up a rapid delivery, timely reporting and quality feedback channel

A well-organized rapid specimen delivery system will deliver specimens in containers meeting international bio-safety standard to contracted laboratories for testing. Results of testing will be promptly reported for early diagnosis and to correctly assess treatment effects. Contracted hospitals will prepare in tables the positive rate and contamination rate of the specimens delivered by the health stations to regularly feedback to the health stations, and also to supervise health stations in improving the management of specimens and quality of delivery. Relevant tables will be regularly prepared and presented to allow the CDC to monitor the epidemic situations.

iv) Monitoring the quality of the contracted testing network

- a. In collaboration with relevant associations, a routine quality monitoring mechanism of the contracted laboratories will be established on special project basis. The mechanism will have specimens of the same level from the College of American Pathologists (CAP). Along with on-site inspection, laboratories will be supervised to improve their quality of testing and to prevent careless testing.
- b. Meetings of scholars and experts on the laboratory testing of tuberculosis bacilli will be held regularly to review the actual practice of the contracted testing network, to examine tables and statistics, to identify problems of the network, and to come up with solutions.
- c. A reporting system for the laboratories will be established to allow reporting online, inquiries on testing results, and checking and comparing of findings.

v) Enhancing the willingness of hospitals in conducting testing for tuberculosis bacilli

Under the general principle of balanced development by region, hospitals will be subsidized to improve their facilities for the testing of tuberculosis bacilli and thus to enhance their willingness to participate in the project, and at the same time, to expand the participation of the contracted laboratories, and thus to improve the quantity and quality of sputum testing.

(2) To establish regional-level laboratories for the testing of tuberculosis bacilli

From the contracted laboratories of certain quality level, one will be selected in each of the northern, central, southern and eastern regions to serve as a regional-level laboratory. Such laboratories will assist in the training of the laboratory personnel of other laboratories in the region to improve their capabilities; they will also help improve the quality of laboratories in

the region; and provide counseling and supervision including such as panel testing. They will also be responsible for the laboratory testing of suspected herd infection in their region.

(3) To establish a national standard center for the laboratory testing of tuberculosis bacilli

In collaboration with medical centers, a national standard center for the testing of tuberculosis bacilli will be established to be responsible for the testing of special tuberculosis bacilli (such as gene assessment, species assessment), the establishment of tuberculosis strain bank/gene bank, research and development on laboratory technology, and supervision, support and assessment of laboratories for tuberculosis testing throughout the country.

(4) Monitoring of drug-resistance

Through reports on drug sensitivity test of contracted laboratories, drug-resistance in all areas will be monitored to assess the quality of case management for early intervention.

(5) Academic institutions will be encouraged to conduct research related to the testing of tuberculosis bacilli.

(6) A guide on the new technology in the testing of tuberculosis bacilli will be developed.

Meetings of scholars and experts will be held regularly to review the current “Manual for the testing of tuberculosis bacilli”, to follow up the new science and technology in laboratory testing in the world, and through their consensus, to formulate guidelines (including external quality assurance, EQA) for the reference of all laboratories throughout the country.

(7) Formulating reasonable payment standard for the laboratory testing of tuberculosis bacilli

Meetings of scholars and experts will be held to accurately calculate the costs of laboratory testing for tuberculosis bacilli for the reference of the Bureau of National Health Insurance in adjusting the payment schedules, and to help solve the difficult situation of hospitals of “doing more, losing more”, and thus to enhance their willingness to install facilities for laboratory testing.

3. Cure TB

1) To Construct a Complete and Comprehensive Tuberculosis Diagnosis and Treatment Network

(1) To continue to conduct certification of designated physicians for the diagnosis and treatment of tuberculosis

Through various educational opportunities, the quality and quantity of tuberculosis diagnosis and treatment will be enhanced; certification of designated physicians and hospitals for the diagnosis and treatment of tuberculosis will be continued; and tuberculosis care will be integrated in the community to allow cases to access to high-quality and convenient medical care services. Specialists in thoracic medicine, infectious diseases and tuberculosis are required to take each year a minimum of four hours training organized by their respective medical associations; physicians other than the three specialties are required to take 24 hours of training for general practice organized by the CDC before a certificate is issued by the CDC. They can then participate in the tuberculosis medical payment improvement plan of the Bureau of National Health Insurance. Their functions are:

- i) to accept tuberculosis patients referred by local public health nurses;
- ii) to manage problems related to the diagnosis and treatment of tuberculosis patients;
- iii) to offer medical counseling to tuberculosis patients;
- iv) to serve as consultant physicians to local health bureaus in the implementation of the

tuberculosis control program;

- v) to chair or participate in tuberculosis case conferences of the health bureaus; and
- vi) to serve as a seed teacher in the teaching and training courses on tuberculosis.

(2) To conduct certification of tuberculosis diagnosis and treatment hospitals in coordination with the tuberculosis medical payment improvement plan of the Bureau of National Health Insurance

- i) Local medical care institutions with convenient access, if equipped with laboratory facilities for tuberculosis testing (may join the commissioned tuberculosis testing network of the CDC if no such laboratory is available), and staffed with designated physicians for tuberculosis diagnosis and treatment mentioned above, may participate in the medical payment improvement plan to accept quality assessment and various training and supervision programs.
- ii) Designated hospitals for the diagnosis and treatment of tuberculosis should be fully capable of tuberculosis diagnosis and treatment. They should be, under the supervision of the health bureau, jointly responsible for some basic missions such as case management and health education, and function as a core unit for case-finding and reporting in the entire tuberculosis control system. Case management workers of hospitals should work closely with local health bureau to conduct management of cases to meet the requirement of the WHO of “constructing a community-oriented tuberculosis diagnosis and treatment system”.

(3) Responsibilities of the designated hospitals are:

- i) To provide patients with comprehensive medical care services and counseling on tuberculosis;
- ii) Upon request of disease control organizations, to provide information related to patients for the smooth promotion of case management.

(4) Rights of the designated hospitals are:

- i) Disease control organizations, in managing the diagnosis and treatment of tuberculosis patients, may refer with priority suspected cases and contacts for confirmation testing to the designated hospitals;
- ii) Disease control organizations will assist the designated hospitals in the follow-up of cases to urge them for regular re-visits.

(3) To upgrade the quality and quantity of designated physicians for the diagnosis and treatment of tuberculosis

- i) More training courses for designated physicians will be organized on the diagnosis and treatment of tuberculosis, management of adverse effects of tuberculosis medicines, treatment of tuberculosis with multi drug-resistance, and thus to increase the number of certified designated physicians.
- ii) In collaboration with county/city health bureaus and relevant medical associations, continuing education on the diagnosis and treatment of tuberculosis will be organized to maintain the quality of diagnosis and treatment. The possibility of establishing a quality assessment mechanism for physicians will be studied in collaboration with relevant medical associations.

(4) To set up an expert counseling/referral mechanism for physicians in the diagnosis and treatment of tuberculosis

Using the current level system of physicians for the diagnosis and treatment of tuberculosis, physicians at the teacher's level will provide services in professional counseling and arbitrations of disputes; physicians at the expert level will provide referral services; physicians at the diagnosis and treatment level will provide front-line medical care services. In this way, local health bureaus will be able to set up an expert counseling/referral system for tuberculosis control.

(5) To upgrade the quality of the designated hospitals

Through incentives and assessment, the quality of designated hospitals will be upgraded.

i) Incentives

- a. Health administration should coordinate in the promotion of the functions of designated hospitals in the locality, and should refer with priority patients and suspected cases in the community to these hospitals, and also individuals of the high-risk groups for screening.
- b. Distribution of designated hospitals will be reviewed. In areas of scarce resources, local medical care institutions will be encouraged to recruit physicians and set up wards. Training opportunities will be made available.
- c. Horizontal coordination between the central health organization and the corporative bodies will be strengthened to monitor the process.

ii) Mandatory accreditation

In the early stage of the construction of tuberculosis diagnosis and treatment network, certification of physicians and hospitals will be done through supervision and encouragement. Later, all criteria will be integrated into one accreditation system for the control of communicable diseases in the current accreditation system for teaching hospitals for more effective management. This accreditation system mentioned above will assess not only the quality of laboratory testing, diagnosis and treatment of those hospitals in the network, their hardware facilities, it will also assess the ratio of patients cured against target, case management rate, and quality of coordination with the public health systems.

(6) To provide medical care services to patients of multi drug-resistance and chronic open pulmonary tuberculosis cases

- i) The WHO recommendation in 2002 suggests that countries with primary multi drug-resistance ratio and complete cure ratio at the same level as Taiwan should improve with priority the quality of tuberculosis control. Action should be taken to intensify the management of non drug-resistant cases (such as the promotion of DOTS), and thus to improve the situation of drug-resistance tuberculosis. If social resources permit, the provision of medical care services to patients of multi drug-resistance may be considered.
- ii) In collaboration with the DOH chest hospitals, medical care services to tuberculosis patients of multi drug-resistance and chronic open pulmonary tuberculosis patients will be provided; difficult cases that other general hospitals cannot handled will be managed; incentive schemes will be developed to encourage the above-mentioned patients to continue adequate medical care and thus to improve the complete cure rate and to prevent the spread of the infection sources.

(7) To set up advisory groups for tuberculosis diagnosis and treatment

i) Purposes:

a. To assist in the confirmation diagnosis of tuberculosis cases; to review second-line medicines for tuberculosis; and to offer recommendations for the management of problems associated with diagnosis and treatment;

b. To provide training to tuberculosis control personnel to upgrade the standard of tuberculosis care;

c. To provide the tuberculosis medical care network of the CDC with relevant counseling.

ii) Organization: The advisory groups will be set up in the 1st, 3rd, 4th and 6th branch bureaus of the CDC.

iii) Missions of the advisory group members:

Local specialists with rich clinical experience in the diagnosis and treatment of tuberculosis will be appointed as members for a term of one year. They will be directly appointed by the CDC. Their missions are:

a. To offer suggestions to the management of tuberculosis cases of doubtful diagnosis and treatment; to assist the original physician attending to the patients in the confirmation diagnosis;

b. To provide counseling to medical care institutions on the diagnosis, treatment and medication of tuberculosis cases;

c. To review prescriptions of the second-line medicines provided free to medical care institutions by the CDC;

d. To provide counseling to the establishment of the tuberculosis medical care network of the CDC;

e. To assist the CDC in formulating criteria for the certification of tuberculosis diagnosis and treatment hospitals under contract in the tuberculosis medical care network and to review their qualifications;

f. To assist in the coordination of medical care institutions at various levels in the tuberculosis medical care network for their full functioning, adequate referral and care of patients;

g. To assist in interviewing cases difficult to treat or non-compliant cases;

h. To assist in the investigation and management of sudden outbreaks (or unusual) of epidemics;

i. Other counseling and assistance related to the diagnosis and treatment of tuberculosis;

j. To review applications for the hospital care of residents of the indigenous areas and chronic infectious cases.

iv) Operational procedures;

a. Review of cases and discussion at meetings;

b. Interviewing cases;

c. Assisting in the investigation and management of epidemic outbreaks;

d. Review of the second-line anti-tuberculosis medicines;

e. Regular meetings of the members.

(8) Inspection on the nosocomial infection of tuberculosis

The CDC has, since 2004, in coordination with the current nosocomial infection control inspections and the publication of the “Guidelines on the control of nosocomial infection of tuberculosis”, strengthened the inspection of nosocomial infection of tuberculosis. Measures include regular x-ray screening, education and training, examination of contacts, isolation of sputum-positive cases, and coughing monitoring. Since 2005, tuberculosis inspection has been included in the inspection of nosocomial infection to become a routine item for each year to continue to promote the control of nosocomial infection of tuberculosis.

(9) To set up tuberculosis teaching, demonstration and evacuation centers

i) Purposes:

- a. To attain the CDC’s goal of reducing tuberculosis by half in ten years;
- b. For the care and placement of tuberculosis patients of multi drug-resistance and chronic open tuberculosis cases;
- c. Hospital care of sputum-positive cases and referral of cases by level;
- d. Upgrading the quality of medical care of tuberculosis patients in Taiwan.

ii) Organization

Initially, the center will be set up at the Tainan Thoracic Hospital, to expand later to the Taipei area, the northern area, the central area, the Yunchang area, the southern area, the Kaoping area, the Hualien area, and the Taitung area. Qualified hospitals in these areas will be selected to serve as the teaching, demonstration and evacuation centers of the CDC for tuberculosis patients. Such centers should meet the following criteria:

- a. Equipped with negative-pressure isolation wards and are qualified by regular inspections;
- b. Capable of diagnosing and treating patients of multi drug-resistance or chronic infectious patients;
- c. Carrying second-line anti-tuberculosis medicines under adequate management;
- d. Equipped with laboratories for the testing of tuberculosis;
- e. Each year, more than 100 tuberculosis cases are reported and placed under management;
- f. A member of the medical payment improvement plan for tuberculosis of the National Health Insurance;
- g. A member of the CDC’s “designated medical care institutions not covered by the National Health Insurance”.

iii) Missions of the center are:

- a. Treatment and management of cases;
- b. Provide cases with information on home nursing care;
- c. Provide cases with relevant social resources for case referral;
- d. Follow-up cases after return to community;
- e. Arrange case conference for cases to be referred;
- f. Arrange case conference for cases transferred out;
- g. Arrange case conference for the assessment of the treatment effects of cases;
- h. Arrange opportunities for the advanced training of medical and nursing personnel;

- i. Prepare annual report;
- j. Management of the second-line anti-tuberculosis medicines.
- iv) Assessment of the process of the treatment of cases.

During the hospitalization of patients, the branch bureaus of the CDC will, at least once every week, invite members (one to two) of the tuberculosis advisory groups to visit the tuberculosis teaching, demonstration and evacuation center hospitals to assess the treatment of patients and to conduct bed-side teaching. The hospitals concerned will prepare records of the assessment.

(10) To establish a platform for the reporting of isolation beds for respiratory tract infections and coordination for their allocation

To meet the needs for the allocation of respiratory tract isolation beds for the hospital care of tuberculosis patients, liaison windows for infection control will be set up in medical care institutions. Medical care institutions equipped with isolation beds for respiratory tract infections are required to report online the 1st and 15th days of the month the availability of beds for the effective allocation of beds between hospitals.

2) Medical Costs Paid from Government Budget

The resolutions of the Executive Yuan meeting held by Premier Hsieh instructed that the Department of Health budget all medical costs associated with communicable disease control separately from the National Health Insurance budget. To comply with the above-mentioned resolution and to promote the policy to reduce tuberculosis by half in ten years, medical costs for the care of tuberculosis patients and their co-payments are now integrated in the CDC's budget to assure the smooth promotion of the tuberculosis control program, to safeguard the finances of the National Health Insurance, to protect the rights of patients to medical care, and thus to promote the health of the people. To meet the need of disease control, medical costs for sputum-positive cases will have the priority.

3) To set up a special project management system to upgrade the quality of tuberculosis care

To strengthen the horizontal coordination and integration between the medical care and the public health systems, a project to improve the quality of tuberculosis care has been promoted. Through the establishment of full-time personnel for case management and improvement of their salaries, the service quality of medical care institutions has been upgraded. The measure practiced by the CDC since August 2004 to waive self-payment for medical care under the National Health Insurance has enhanced the willingness and stability of the public to seek medical care, reduced the loss-to-contact rate of tuberculosis cases, and improved the complete cure rate.

4) To improve the management of cases under care

(1) To extensively implement the DOTS plan

i) Purposes

Treatment of tuberculosis takes a course of more than six months; it is a long process. It requires patience and will-power on the part of the patient to lonely take medicines day by day, to face the discomfort brought about by medication, and to tolerate all kinds of likely adverse reactions. For many reasons, they cannot regularly take medicines for long time; and as a result, disease cannot be cured, and they continue to transmit the disease to many others.

Chances are they would develop drug-resistant bacilli to pose more serious problems. The WHO strongly urges that each sputum-positive case follow the DOTS (Directly Observed Treatment, Short-Course) plan. Through the plan, a trained and objective care-giver (not a family member) will “deliver medicine to your hands; see to it that you take the medicine; you finish the medicine and I will go”. They are concerned with the process of medication of tuberculosis cases and want to make sure that every case takes every piece of medicine regularly by order. In the long process of treatment, they help tuberculosis patients regain health, and at the same time, eliminate one source of infection. Case management, therefore, is very important, and more resources should be put in to effectively reduce the loss-to-contact rate, improve control effects, and reduce patients of drug-resistance.

ii) Methods of implementation

a. When cases are under the DOTS plan

- a) DOTS in hospital: Confirmed sputum smear positive cases considered necessary for isolation care shall be placed under mandatory isolation care in hospital. All hospitalized confirmed tuberculosis patients, during their hospitalization period, will be managed by the hospital, and offered the DOTS plan and other relevant case-management measures.
- b) DOTS in community: District management workers assigned by health stations will coordinate the DOTS units (medical care institutions, health stations qualified as medical care institutions, chronic disease control centers) to send DOTS care-givers to supervise confirmed sputum-positive cases when they are placed under home care in community.
- c) Linking between hospital and community in the DOTS plan: District management workers assigned by health stations visit patients under DOTS plan in hospitals at least once before they are discharged (before they are placed under the community DOTS plan) to brief them on the community DOTS plan, and to coordinate with the case management workers of the hospital on matters concerning transferring of cases to community care.

b. Delivery of medicine

- a) Delivery to home: by the DOTS care-givers and supervise cases to take medicines.
- b) Medicine supply spot: anti-tuberculosis medicines are kept at a specific place. Cases are asked to come up and take medicines there.

c. Team work

- a) Health bureaus select and set up DOTS units. DOTS units are medical care institutions, health stations qualified as medical care institutions, and chronic disease control centers.
- b) DOTS units should collaborate with the medical care institutions that the patients visit to form a team. Members of the team include counseling physician, clinical physician, case management worker, supervisor of health bureau, district management worker of health station (public health nurse), DOTS care-giver and social worker.
- c) The DOTS unit is the coordination (including service) center of resources for the treatment of patients. Case management of tuberculosis cases in the area and program activities (including diagnosis, treatment and medication) will be reviewed and discussed.

d. Process in the selection of patients for the DOTS plan

a) Patients reported and confirmed as tuberculosis cases are included in the DOTS plan.

(a) The purpose of this confirmation mechanism is to reduce chances of sputum-positive non-tuberculosis cases being included, and to assure the correctness of the medical orders that the care-givers comply with.

(b) Sources of the counseling physicians

(b-1) Two or three specialists of the hospital in infectious diseases, thoracic medicine or tuberculosis are appointed;

(b-2) Or, the current county/city tuberculosis consultants will be made responsible each for a district;

(b-3) Clinical physicians cannot be consultant physicians at the same time for the cases under their treatment.

(c) Items for counseling: diagnosis of tuberculosis, prescriptions for anti-tuberculosis medicines, confirmation diagnosis of cases without specimens for testing, referring of disputable cases to the tuberculosis advisory group for counseling, and others.

(d) Process of confirmation diagnosis:

(d-1) Where counseling physicians are designated by hospitals: Confirmed by counseling physicians before reporting through review of relevant medical records; when reported by writing, the report must be signed by the counseling physicians; when reported online, counseling physicians select the “decided by hospital” column and input their names.

(d-2) Where no counseling physicians are designated by hospitals: Relevant information associated with the cases will be sent by the county/city health bureaus within three days after the registration of the cases to the physicians in-charge of the district for review; after the review by the physicians in-charge, the county/city health bureaus select the “responsibility of district physician” column under the counseling physicians in the information system and input names of the counseling physicians.

(d-3) When decided “sputum smear positive confirmed” by the review results of counseling physicians, the cases are placed under the DOTS plan.

b. When cases agree to be placed under the DOTS plan through communication between clinical physician, district case manager and patient, a letter of agreement will be signed by the case. For cases participating in the DOTS plan, record will be set up and managed by the DOTS care-givers and managers. For cases that do not agree to participate in the DOTS plan, they will be followed-up closely for management by district managers by regulations of case management.

c. Cases under self-management will be closely followed-up by district managers or case managers of hospitals. If non-compliance to medication is found, they will be handled as non-compliant cases. When necessary, they will be transferred by force in accordance with regulations of Article 43 of the Communicable Disease Control Act to designated isolation institutions for isolation care.

d. For those who agree to accept the DOTS plan, the DOTS care-givers will see to it that they show up at the drug supply spot (most convenient to the patient, either delivered at home or to

a supply spot) and that they take medicines on time.

e. When the DOTS care-givers observe medication of patients the first time, they should be accompanied by district managers. They should understand the basic information of the patients, kinds of medicines taken and dosages.

(5) Procedures in conducting the DOTS plan by the DOTS care-givers

a. Observation of patients under the DOTS plan by doctor's order: If patients are to take medicines daily, the DOTS care-givers should observe medication for at least five days (inclusive) a week; if patients are under the high-dosage intermittent treatment, they are observed by doctor's order on the day of medication for at least three times a week.

b. DOTS care-givers will collect from the DOTS units anti-tuberculosis medicines, DOTS daily record, and invoices or food, and proceed to the appointed site at the appointed time for the observation of medication.

c. Ask patients if there are any uncomfortable or adverse reactions in the course of medication (If patients are not feeling well, record it on the daily record and telephone either the district manager or the case manager for support to handle the problems.)

d. Make sure the kinds and amount of medicines the patient is taking.

e. Observe medication of the patient.

f. Ask the patient or the family if any help is needed.

g. Remind the patient or the family the time for next medication; make sure if sputum test is required.

h. Give the patient the invoice or food, and ask him/her to sign the paper.

i. The DOTS care-giver, upon return to the DOTS unit, should discuss the case with the health station district manager (public health nurse) and the supervisor, prepare the DOTS daily record and input information in the computer.

(6) Share of responsibilities

a. At the health station level: The chief of the health station will allocate manpower for the high-quality management of tuberculosis cases, and coordinate social and support resources needed for the diagnosis and treatment of cases.

b. At the county/city health bureau level:

(a) Setting up DOTS units

(a-1) Coordinate with the DOTS team (including clinical medical care institutions, designated physicians); assess the number of care-givers required and recruit them; ask the DOTS unit of the DOTS care-givers to conduct observation of the medication process of cases; make sure that cases take every dose of the anti-tuberculosis medicine in the entire process following the physician's order regularly.

(a-2) Appoint counseling physicians for diagnosis and treatment

(b) Supervisors will be appointed for monitoring and supervision; telephone-interview cases as to their medication and any help needed; spot-check cases every month, assess the implementation of the DOTS plan.

(c) Key-in the computer findings of checking.

(d) Hold regularly monthly meetings to discuss the supervision of cases.

(e) Coordinate the public health and the hospital case management systems in the area.

c. At the CDC branch bureau level:

(a) Supervise the implementation of the DOTS plan by the county/city health bureaus.

(b) Assist county/city health bureaus in coordinating cross-county/city public health and medical care systems for cooperation.

(c) Assist counties and cities in the training of the DOTS care-givers.

(d) Spot-check cases under the branch bureaus; assess the implementation of the DOTS plan.

(e) Reflect the implementation of the DOTS plan in the region.

d. At the CDC/DOH level:

(a) Check and control the progress through computer databank.

(b) Evaluate and improve program implementation.

(c) Check cases on unscheduled basis; assess the implementation of the DOTS plan.

(7) Roles of participants (for example):

a. Instructor physicians: supervise the diagnosis and treatment of the clinical physicians; assure the management policies; review prescriptions of the clinical physicians; participate in case conferences; when necessary, assist in the home-visiting of cases.

b. Clinical physicians: report and diagnose cases; encourage patients to join the DOTS plan, participate in case conferences.

c. Hospital case managers: supervision and health education of tuberculosis cases of the hospital; make sure they return on schedule for treatment; coordinate with public health nurses and DOTS care-givers in the transferring of cases from hospital to the community.

d. Supervisors of health bureaus: oversee and check the work of the DOTS units in the area; assist in the implementation of the DOTS plan; conduct the DOTS work required of the health bureaus.

e. Health station district managers (public health nurses): work on the DOTS plan of the DOTS units; assist the DOTS care-givers in the implementation of the plan; conduct other matters associated with the DOTS plan.

f. DOTS care-givers: conduct DOTS plan following the Guidelines for DOTS Care-Givers in the Implementation of the DOTS plan.

g. Social workers: assist patients in applying for relief, subsidies or referral.

(8) Mechanism for evaluation:

Meetings will be held regularly with health bureaus and related scholars and expert for discussion on problems encountered in the practice of the DOTS plan. Recommendations for improvement will be made.

(2) To encourage patients for regular treatment

Patients will be encouraged for treatment with the "Manual for TB Treatment". Physicians will be reminded to fill in all information relevant to patients for disease control units to timely understand the treatment and re-examination of the patients for follow-up. Substantial incentives will be made available to encourage patients to return for treatment on

schedule and to follow regular treatment. In consideration of the special cultures, the social and economic conditions, and the medical care resources of the mountain areas and offshore islands, a community-oriented service system operated by the local health station personnel will be promoted for case management to improve the effects of treatment and management.

(3) To integrate cross-ministerial resources to promote community-based tuberculosis control in indigenous areas

i) To subsidize residents of indigenous areas for hospital care

Encourage indigenous confirmed cases to visit contracted hospitals for treatment for the first two months of the treatment course. Their medical costs, room and board will be subsidized, and a living allowance will be provided. This is to encourage patients to go through regular treatment and to improve complete cure rate.

ii) To hold contests on tuberculosis control in indigenous areas

Through contests and incentives, health bureaus are encouraged to develop community-based tuberculosis control programs. Through integration of resources in the indigenous areas and by mobilizing for tuberculosis control, improvement will be made in the active case-finding, in the follow-up management of cases, and thus to interrupt the transmission of tuberculosis in the indigenous areas and to reduce the occurrence of tuberculosis.

iii) To provide tuberculosis cases with employment opportunity in the community

On the principle of community or tribe-wide service, tuberculosis-related training will be organized and employment measures will be taken to reduce barriers in communication, and to assist in the promotion of the tuberculosis control program.

(4) To provide infectious pulmonary tuberculosis patients with isolation care

i) Mandatory isolation care

a. If infectious pulmonary tuberculosis cases (particularly the sputum smear positive cases, and cases of multi drug-resistance) are decided by specialist physicians to require hospital care, or if they fail to comply with the physician's order to take medicines regularly and refuse, when recommended, hospital care, they will be placed under mandatory isolation care by regulations of the Communicable Disease Control Act and procedures of the Administrative Procedures Act; if patients still refuse (unwilling to) hospital care after notification, they will be penalized. They or their families will be notified in writing or orally for mandatory hospital care.

b. If patients still refuse hospital care after the notification for mandatory hospital care is served, they will be fined NT\$ 10,000 up to 150,000, and so fined consecutively.

ii) To implement the placement and management of chronic infectious tuberculosis cases

Chronic infectious pulmonary tuberculosis cases are encouraged to visit contracted hospitals for long-term hospitals care. They will be subsidized their medical costs, room and board, and a living allowance will be provided to allow patients to receive regular care and to interrupt sources of infection.

(5) To provide patients not covered by the National Health Insurance with medical care

To prevent patients not covered by the National Health Insurance from failing to seek examination and medical care for financial reasons, and thus to minimize the negative impact on the overall control effects, their medical costs for the treatment of tuberculosis will be paid.

(6) To strengthen the quality monitoring of case management

i) Feedback through routine monitoring reports to county/city health bureaus

Various statistical tables on the quality of program activities and various real-time monitoring indexes (such as complete cure rates for 9, 12, 15 and 18 months) will be prepared from the national tuberculosis patient databank in the form of routine reports for the reference of county/city health bureaus in the promotion of program activities.

ii) Evaluation of the annual performance of county/city health bureaus against targets

Statistical data on program activities will be taken from the national tuberculosis patient databank to compare with the performance reports of county/city health bureaus to evaluate their work. This will be one of the items for the evaluation of county/city health bureaus to enhance the strict monitoring of the management of cases and work performance.

iii) Regular on-spot checking of county/city health bureaus

The CDC will conduct regular on-spot checking of the local tuberculosis control and to score the performance. By on-spot investigation and supervision, the quality of the work of case managers is assured.

(7) To encourage district case management personnel to actively follow-up cases

i) To formulate standards for the supervision of the management of tuberculosis cases;

ii) To establish models for coordination between the public health and the medical care systems in the care of tuberculosis cases;

iii) To regularly select excellent workers for public commandment.

5) To conduct training for professional personnel

In collaboration with local health agencies and academic institutions, training programs on tuberculosis control-related professional skills for physicians, laboratory testing personnel, nursing personnel of medical care institutions, case managers, and personnel of health and other related organizations will be organized. In collaboration with medical schools, training in the clinical care of tuberculosis patients for medical students and resident physicians will be strengthened. Training for general practitioners has been extended from four hours to 24 hours since 2004. In addition to general courses, advanced training courses have also been organized in collaboration with hospitals: diagnosis of cases under the supervision of experienced tuberculosis specialists and case conference, and training in the reading of x-ray films. The curricula and hours are shown as follows:

Curriculum	Hours
Tuberculosis – training for general practitioners	24
Advanced training for tuberculosis physicians	72
Training in the reading of chest x-ray films	30
Training for case managers of hospitals	10
Training for nursing personnel of medical care institutions	6
Training for personnel of health organizations	16
Training for county/city tuberculosis control supervisors	8
Training for county/city tuberculosis control nursing personnel	7

4. Health Education and Immunization

1) To strengthen health education to promote the knowledge and skills of the public on tuberculosis control

(1) Through various media (TV, radio, newspapers, the Internet, LCD), information on tuberculosis control will be disseminated. The Government Information Office will be requested to make available more communication channels for health education.

(2) Innovative educational materials will be produced; more promotion channels will be developed to reach different target groups to advocate the concept of prevention and control.

(3) In coordination with the global theme of the World Health Organization, extensive activities will be organized before and after the World Tuberculosis Day to arouse the attention of the public.

(4) Promotion activities of local colors with the active participation of communities, the indigenous peoples, medical care institutions and schools will be developed in collaboration with county/city governments taking into consideration the main issues, the specific local cultures and festivals to promote community-based health education programs.

(5) Main issues of health education:

i) Avoid delay in medical care: early symptoms of tuberculosis are insignificant, primarily of coughing, with sputum and chest pain. These symptoms are often overlooked and medical care is delayed. Chances of transmission to others are high.

ii) Get examination if coughing for three weeks consecutively: People who have coughed consecutively for three weeks should receive chest x-ray examination and sputum testing; should comply with doctor's orders to take medicines for six to nine months. They will then recover.

iii) Regular medication, avoid drug-resistance: In the course of treatment of tuberculosis, if medicines are taken by choice, if dosage is reduced arbitrarily, or if medication is suspended at random, drug-resistant bacilli are likely to develop and thus result in the failure of treatment.

iv) Routes of transmission: Tuberculosis is transmitted by droplets; good ventilation and sufficient sunshine can reduce the infection of tuberculosis.

v) Protect the education, employment opportunities and privacy of patients.

vi) Accept and care about patients.

2) Strengthen Immunization

(1) Follow-up the BCG immunization coverage of children under one year.

(2) Census of school children will be conducted upon their entering of primary school. Those not infected will be given make-up immunization. Sources of infection of those infected will be traced. Annual infection rate will be calculated.

(3) Training in immunization skills will be strengthened. Procedures will be standardized. County and city governments will be encouraged to organize cross-county/city alliance for education and training.

(4) Potency of vaccines will be assessed at random to assure the quality of vaccines.

(5) In collaboration with academic institutions, research such as assessment of the effects of BCG vaccine, and assessment of the effects of vaccines by the size of tuberculin reactions will be conducted.

5. Manpower Development, Research and International Cooperation

1) To use tuberculosis control as a tool of diplomacy

In collaboration with the Ministry of Foreign Affairs, various plans of international aid will be drafted to assist countries needing help, to upgrade the quality of their tuberculosis control programs, and thus to use tuberculosis control as a tool of diplomacy.

2) In collaboration with the Ministry of Foreign Affairs and others, experience-sharing with other countries and international professional organizations will be strengthened.

(1) Professionals will be selected and dispatched to international conferences, study tours, symposiums and others to learn more about new knowledge and international experience, and thus to upgrade the quality of tuberculosis control in Taiwan.

(2) International academic symposiums will be held; international scholars and experts will be invited to promote academic exchanges and experience-sharing.

(3) Private sector organizations will be subsidized to participate in international conferences.

(4) International aid plans will be executed to help other countries improve their tuberculosis control programs.

(5) Promotional materials will be developed to share Taiwan's experience with others.

(6) Professional exchanges and communication will be maintained with international professional organizations such as the WHO's Global Fund to Fight AIDS, Tuberculosis and Malaria.

3) To collaborate with academic institutions to clarify certain basic information on tuberculosis

Certain basic information concerning tuberculosis such as the TB mortality review, epidemic situations of certain specific ethnic groups, analysis of factors related to the complete cure of tuberculosis cases, distribution of medical care institutions completing cure of tuberculosis cases and others will be conducted together with academic institutions for the reference of policy-making.

Chapter 3. Responsibility Sharing and Budget

1. Sharing of Labor and Responsibilities

- 1) County/city governments: to develop community-based tuberculosis control plans; to implement and evaluate the work of the community-based tuberculosis control plans.
- 2) Ministry of Education: to help health organizations supervise education institutions; to conduct health education on tuberculosis control in schools to disseminate correct information to students; to strengthen guidance of students; to prevent the spread of infection on campus.
- 3) Ministry of the Interior: to help health organizations conduct health education and screening for tuberculosis control in nursing homes, and for vagrants and military; to collaborate in case management.
- 4) Ministry of Justice: to help health organizations conduct health education and screening for tuberculosis control for inmates of correction centers; to collaborate in case management.
- 5) Ministry of National Defense: to help health organizations conduct health education and screening for tuberculosis control for military personnel; to help in the diagnosis, treatment and management of cases.
- 6) Ministry of Foreign Affairs: to help the Department of Health develop various international aid plans; to understand the current situations and actual needs for tuberculosis control in different countries through embassies and medical groups; to actively participate in regional or multi-lateral aid programs through channels of governmental and non-governmental international organizations.
- 7) Government Information Office: to help health organizations conduct health education on tuberculosis control to provide the public with correct information on tuberculosis control.
- 8) Council of Labor Affairs: when tuberculosis cases are found on the health examination for alien laborers, they should be handled immediately, and the local police department be notified; employers should be urged to deport the cases as soon as possible.
- 9) Council of Indigenous Peoples: to help health organizations conduct health education and screening for tuberculosis control for indigenous peoples; to encourage cases to accept regular treatment, change lifestyles, and thus to reduce the morbidity and mortality of tuberculosis.
- 10) Department of Health: to formulate and execute this Plan.
- 11) Tuberculosis-related academic institutions and social organizations: to help health organizations to conduct health education on tuberculosis control; to conduct research and matters concerning international exchanges.
- 12) Medical care institutions: to be responsible for the diagnosis, outpatient clinic care and hospital care of tuberculosis cases; to collaborate with the competent authorities to improve medical care and quality of laboratory testing; to conduct relevant teaching and research.

2. Needs for Resources

For the first five years of this Plan, a total of NT\$ 8,371,351,000 (not including salaries and allowances) is needed. The allocation by year is: NT\$ 1,658,148,000 for 2006; NT\$ 1,665,855,000 for 2007; NT\$ 1,673,907,000 for 2008; NT\$ 1,682,323,000 for 2009; and NT\$ 1,691,118,000 for 2010. They will be paid by the mid-term plan budget of the Department of Health. Allocation of funds by item is shown as follows:

Year	2006	2007	2008	2009	2010	Total NT\$
Item						
Strengthening of health education	31,774,000	33,322,000	34,940,000	36,631,000	38,398,000	175,065,000
Strengthening of immunization	6,907,000	7,244,000	7,595,000	7,963,000	8,347,000	38,056,000
Strengthening of disease reporting and monitoring	6,907,000	7,244,000	7,595,000	7,963,000	8,347,000	38,056,000
Improvement of case-finding	16,578,000	17,386,000	18,230,000	19,112,000	20,034,000	91,340,000
Establishment of the laboratory testing network for tuberculosis bacilli	13,815,000	14,488,000	15,192,000	15,927,000	16,695,000	76,117,000
Establishment of the diagnosis and treatment network for tuberculosis	33,815,000	35,463,000	37,185,000	38,984,000	40,865,000	186,312,000
Medical costs to be integrated in government budget and promotion of the plan for the improvement of medical care quality	1,500,000,000	1,500,000,000	1,500,000,000	1,500,000,000	1,500,000,000	7,500,000,000
Improvement of case treatment and management	27,630,000	28,976,000	30,383,000	31,854,000	33,390,000	152,233,000
Training of professional	9,670,000	10,141,000	10,634,000	11,148,000	11,686,000	53,279,000

personnel						
Manpower development and international cooperation	11,052,000	11,591,000	12,153,000	12,741,000	13,356,000	60,893,000
Total	1,658,148,000	1,665,855,000	1,673,907,000	1,682,323,000	1,691,118,000	8,371,351,000
Capital account	6,800,000	10,990,000	8,000,000	6,600,000	6,600,000	38,990,000
Ordinary account	1,651,348,000	1,654,865,000	1,665,907,000	1,675,723,000	1,684,518,000	8,332,361,000

3. Expected Results and Impact

- 1) In the period between the initiation of the plan till the 5th year (2010), incidence rate will be reduced to 52 to 100,000; age-standardized complete cure rate of cases after follow-up and treatment will reach more than 90%.
- 2) This Plan is to integrate the functions of the tuberculosis diagnosis and treatment system, the laboratory testing system, and the public health disease control system to detect cases earlier for more comprehensive medical care, and to reduce sources of infection, and thus to protect the health of the people.
- 3) The implementation period of this Plan may be shortened along with development in science and technology and international trend when there are new vaccines and rapid diagnosis methods developed and marketed.