Taiwan CDC External Review

Ending Tuberculosis by 2035 Plan

2024 April 22-26

International Tuberculosis Review Panel
Assessment and Recommendations

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International Tuberculosis Review Panel

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"The ITRP members would like to acknowledge the kind support and competent advice received from TCDC throughout their stay in Taiwan as well as the help in finalizing this report. They would also like to express their gratitude to all staff of the facilities visited during the external review for their engagement and provision of all information that facilitated the preparation of this report."

Objectives of The Review

The Taiwan CDC (TCDC) of the Ministry of Health & Welfare (MoHW) of Taiwan convened an International Tuberculosis Review Panel (ITRP) during 22-26 April 2024 to review the Taiwan's National Tuberculosis Programme (NTP) and advise the TCDC on how to reduce the incidence of tuberculosis (TB) in order to achieve the global End TB target of ≤10 cases per 100,000 population by 2035. The general plan and agenda of the week devoted to the review are available in Annex 1.

To advise TCDC and MoHW on the required changes to the current program to effectively and efficiently achieve the End TB targets by 2035 in the context of a situation that includes remarkable changes such as:

- The evolving epidemiological and demographic transitions,
- The emergence of new technologies,
- The general health system and financing challenges.

Background

As an outcome of several well-managed discussions and focused presentations by the TCDC leaders and staff, the ITRP was able to sufficiently familiarise with: (i) the various aspects of TB epidemiology; (ii) the health system elements relevant to prevent, diagnose and treat TB; and (iii) the specific programmatic TB components. The reflections and interpretations by the ITRP are summarised below.

1. ***Epidemiological features that are relevant to Taiwan NTP***

- A rapid decline in TB incidence (5-6% /year) has been observed over last 20 years. The latest TB incidence is 28/100,000 people, equivalent to 6,630 cases in 2023.
- However, since 2021, the curve of TB incidence rate decline has flattened.
- The impact of COVID-19 on the TB burden has been less relevant than in other countries and TB notifications have not decreased.
- The overall number of deaths attributed to TB and the mortality rate are low (457 deaths; 2.0 / 100,000 in 2023). These figures have been stable since 2020.
- A high proportion of cases occur among the elderly (> 60% are aged >65 years).
- On the other hand, TB incidence in people aged <45 years is < 10/100,000.
- The prevalence of HIV infection among TB cases is extremely low (<1%).
- The prevalence of drug-resistant TB (DR-TB), multidrug-resistant TB (MDR-TB) and rifampicin resistant (RR-TB) is very low (~1.5%) and stable.
- The proportion of TB among recent migrants is approximately 10%, it is stable but the absolute number of cases in this population has been declining since 2018.
- The prevalence of diabetes among patients with TB in 2021 was high, around 21%, with a prevalence of diabetes around 10% in the general population.
- TB incidence in mountainous aboriginal regions was 3.1 times higher (87 per 100,000) than in the general population (28 per 100,000), although the absolute number of cases (172 in 2023, i.e., 2.6% of all cases) is small.

These data suggest that there has been a rapid decline in TB incidence in Taiwan in the last two decades (with an observed stagnation in the past 2 years), with a high proportion of cases among the elderly and a very low incidence in younger adults and children. This suggests that current TB transmission is generally low in the general population and that most TB cases are likely due to reactivation of TB infection acquired in the remote past.

2. ***Health system considerations relevant to prevent, diagnose and treat TB***

The ITRP assessed the six traditional WHO building blocks of country's health system with a focus on the implications that are relevant to provision of TB care

- **Leadership and Governance.** The Taiwan health system is based on a well-integrated and coordinated mechanism that can be considered a model of implementation of a public private mix (PPM). Most services are administered by private (non-governmental) hospitals that are, however, largely funded by public sources. Oversight and management involve TCDC at the central level as well as local government health authorities. The Taiwan model to ensure universal health coverage and access to proper TB prevention and care for all is based on an effective interaction of the National Health Insurance (NHI) scheme and the stewardship and supplementary contributions by the TCDC (see below). Social protection mechanisms exist but they are incomplete. A study in 2018 showed that about 22% of patients with TB and half of those with MDR/RR-TB incur catastrophic costs. Therefore, some notable gaps in social protection do exist. This means that people with TB may suffer financial loss caused by the disease (with the main contributor being non-medical expenditures and loss of income).

- **Health financing.** The major vehicle for financing TB care (diagnosis, drug treatment, and case management) is the NHI fee-for-service payments supplemented by Payment for Performance (P4P). Gaps not supported by this funding mechanism exist and include preventive services such as the use of Interferon- ɣ Release Assay (IGRA) for diagnosis of TB infection and medicines for TB preventive therapy, medicines for MDR/RR-TB, and treatment adherence support approaches. In general, these are met by TCDC directly transferring funds to clinical implementing units.

- **Health workforce and human resources**. Several types of health care workers (HCW) at different levels of the health services are involved in the diagnosis, treatment and care of patients with TB. As the number of cases declines, similar to most low-incidence countries, it is becoming difficult to maintain knowledge and skills of the health workforce. In addition, it is proving difficult to attract and retain health and laboratory workers for roles that are focused solely on TB. The ITRP also noticed that there may be insufficient staffing of facilities like the Central TB Laboratory. Novel technologies, including Clinical Decision Support Systems (CDSS) are increasingly available and sophisticated, requiring innovative educational efforts to be systematically utilized.

- **Medical products, vaccines and technologies.** Broadly speaking, diagnostics and medicines required for TB management are universally available, including all the latest tools from rapid molecular tests to targeted next-generation sequencing (tNGS) and new medicines and regimens. Whole Genome Sequencing (WGS/GWAS) is available but only under special circumstances. At present it is not scalable. Systems of procurement and distribution appear efficient throughout the country.

- **Health information system**. TB surveillance is highly effective with multiple overlapping sources of data, making it unlikely that there are any substantial numbers of incident cases that are not notified and escape the system. Cases are reported from clinical facilities and hospitals as well as from bacteriological

laboratories supplementing that information and capturing potentially unreported cases. However, there is limited use of available data as well as useful technologies such as real-time geographical information systems (GIS) and GWS that may help to identify outbreaks and hot spots for transmission, therefore helping target programmatic interventions.

- **Service delivery.** Primary care facilities relevant to TB diagnosis are mainly located in hospital outpatient departments. Most people with TB are diagnosed and reported at the hospitals given the prompt access provided to the population. TB treatment and care are mainly managed through hospitals. Dispensing is preformed largely by health care workers who are also responsible to ensure direct observation of treatment (DOT). In a minority of cases DOT is delivered through digital tools such as video-observed treatment (VOT) and other means of eDOT. Most persons with TB are managed as outpatients after short periods of hospitalizations when required given co-morbidities or treatment complications.

In view of the above considerations, the fundamental policy of universal health coverage (UHC) is well and broadly implemented in Taiwan without significant out-of-pocket costs for patients. However, there are substantial gaps in social protection resulting in the risk of losing income given (i) the inability by people with TB to work due to the illness and (ii) non-medical expenditures. Reliance on TCDC funding support to fill gaps in NHI and local government funding means that the sustainability of important components of the TB programme are vulnerable and highly dependent on the availability of a healthy TCDC budget. From a more technical perspective, the existing effective surveillance system allows the consideration that there are probably relatively few “missing cases” of TB and therefore that the pursue of the ambitious “end TB” targets is justified. At the same time, effective case finding and diagnosis mandates that all HCW encountering patients are trained and capable of suspecting TB and testing for it, especially in an era of sustained reduction of the case burden. Therefore, strategies on case management may need to be strengthened and adapted to the decreased availability of expertise.

3. TB programme specific responsibilities

To properly assess the performance of the TB response in Taiwan we considered all aspects of TB prevention and care, and paid attention to all innovations that are currently available and internationally recommended for adoption. Needs-based and targeted use of such new technologies offers the opportunity to increase effectiveness and efficiency of critical elements of the TB response. They may include, among others, ultraportable digital radiology, Computer-Aided CAD) diagnosis using digital chest x-rays, nucleic acid amplification tests (NAAT) for detection of TB and DR-TB, genotyping for detection of drug resistance and molecular epidemiology, novel and shorter treatment regimens for drug-susceptible TB, DR-TB, and preventive treatment, digital adherence technologies, and Clinical Decision Support Systems (CDSS) to promote evidence- and guidelines-based decision-making by clinicians.

- **Screening and case finding activities.** TCDC enjoys a very comprehensive system for screening and active case finding strategies. However, only 4% of all notified cases are detected through active case finding which may require close assessment over the years to ensure cost-effectiveness of the interventions. While high risk groups have been identified for focused screening, they are currently not well defined, and the denominator population, and hence capture rate, cannot be assessed accurately. The ITRP discussed the need to improve identification of "hot spot" for the implementation of active case finding, including targeting of settings where there is evidence of ongoing transmission and utilizing genotyping (e.g., WGS) to precisely identify outbreaks. Contact investigation is rigorously conducted, and outbreak investigation follows sound standards. The use of computer-aided detection (CAD) for chest radiography screening is being introduced.

- **Diagnosis.** Most diagnoses (about 95%) are made in the clinical setting among symptomatic patients presenting spontaneously to health services. All diagnostic technologies are available including radiology, fluorescent microscopy, mycobacterial culture and phenotypic drug-susceptibility testing (DST), molecular diagnostics, genotyping (MIRU), and genetic sequencing including tNGS for rapid detection of drug resistance. The NTP has also access to WGS to supplement MIRU genotyping method in investigating clusters. Virtually all people evaluated for TB have three sputa sent for acid-fast bacilli (AFB) smear microscopy and mycobacterial culture. This procedure is repeated, at regular intervals, during the course of treatment, to evaluate treatment response. These practices result in approximately 700,000 mycobacterial cultures performed per year, noting that the number of TB cases is < 7,000 per year. This, therefore, puts a tremendous work burden on the laboratories.

  In contrast to the widespread use of smear microscopy and culture, many people evaluated for TB are not offered NAAT. This is a problem because the sensitivity and specificity of smear microscopy are both substantially inferior to NAAT. Furthermore, the results of TB liquid culture may take up to 2-6 weeks, in contrast to NAAT which has a turnaround time (TAT) of a few hours, though the sensitivity of NAAT is inferior to liquid culture. Also, the failure to perform NAAT at the time of initial investigation means that there is an unnecessary delay in the detection of drug resistance, besides diagnosis of TB. Although RR- and MDR-TB are uncommon in Taiwan, those with these resistant strains will not be diagnosed in a timely manner and hence will pose an unnecessary transmission risk to others.

- **Treatment and adherence to treatment.** Treatment regimens for drug susceptible TB are appropriate. For patients with MDR/RR-TB, the NTP is beginning to roll-out the BPaLM[i] regimen for those patients for whom it is indicated. However, many people with MDR-TB are still receiving the old 24-month regimens that contain injectable drugs. Few patients are currently receiving the all-oral, bedaquiline (BDQ)-containing 9-month regimen. Given that BDQ may have resistance associated variant, DST for BDQ is necessary.

Adherence support focuses on the use of directly observed therapy (DOT). Treatment observers, who are each responsible for between 5 and 15 patients, meet with each patient at a convenient time to observe the ingestion of medicines. eDOT approaches such as video DOT have been introduced but implementation remains limited (< 20%) at this time. The program is not currently using Medication Event Reminder Monitor (MERM) system devices. Finally, Taiwan NTP has introduced the use of TB SMART cards, an innovative technology to share patient's clinical information.

- **Detection and treatment of TB infection.** IGRA are used systematically in the conduct of detection of TB infection status and treatment. The focus is currently mainly on high-risk groups including contacts and high-risk clinical conditions, but not among HCWs and migrants. For the latter, it may be useful to strengthen the process of counselling and reaching consent to ensure adherence to the intervention. Regarding treatment, the regimen is determined by individual physicians. This results in the use of many different regimens without clearly specified indications. Guidance based on scientific evidence may be necessary. Regimens such as those rifapentine-based – i.e., 3HP and 1HP – have been recently introduced. Directly observed preventive therapy (DOPT) is implemented but there is a need of clarity about indications and rationale.

- **Migrants and other risk groups.** Migrants to Taiwan usually suffer from poor social conditions, language barriers, and reduced access to care. However, contrary to other countries, a clear policy exists that migrants with TB are not deported, thus avoiding the potential disincentive to attend clinical facilities for TB diagnosis and care.

- **Multidrug- and rifampicin-resistant resistant TB (MDR/RR-TB).** The Taiwan MDR-TB Consortium (TMTC), established in 2007, operates under a strong collaborative mechanisms between the public health authority and clinical teams, and has been a highly effective model of care in the management of MDR/RR-TB. All new DR-TB regimens and medicines are utilised in Taiwan, including pretomanid and the BPaLM regimen. However, the current policy of deportation of foreign-born people affected by MDR/RR-TB is dubious and in need of re-consideration.

- **Surveillance and data use.** As mentioned above, the surveillance system in Taiwan is highly developed and efficient. The systematic engagement of laboratories and the auto-uploaded laboratory data is a major contributor to the efficacy of the information system. Cross matching of laboratory report and notification records generates a high capture rate and averts the risk of under-notifications. However, an increased focus on epidemiological analysis of TB patients aged over 65 years could be targeted to better assess trends and outcomes, and therefore strategically inform interventions among this highly affected segment of population.

- **Public-private mix (PPM) and case management in hospitals.** While private sector hospital-based HCWs deliver a large proportion of TB care in Taiwan, the system is such that this PPM model functions properly. Through close monitoring, universal DOT is carried out for almost all patients.

- **Infection prevention and control.** The ITRP visited some clinical and laboratory facilities, noticing a high level of infection control measures implemented in Taiwan.

- **Health workforce devoted to TB services and care.** As mentioned above, since TB incidence is decreasing rapidly, maintaining a good level of training and awareness on tuberculosis among HCWs is a major challenge. As documented in low-burden, high-income countries, lack of proper education and capacity in the TB response compromises TB care. Oversight and coordination by agencies such as TCDC are therefore fundamental and need to be constantly assessed and re-designed as necessary. In addition, coordination of the variety of staff engaged in TB care must be sustained at all costs given the excellent yet delicate and multi-actor mechanisms through which the programme is delivered.

- **Laboratory activities.** Sputum smear microscopy, NAAT, mycobacterial culture, identification of Mycobacterium species, 1st line- and 2nd line- drug susceptibility testing (DST) are carried out systematically. The ITRP identified, however, a lower-than- expected use of NAAT with a coverage that is still only 70% rather than universal. On the other hand, sputum smear microscopy is abundantly used in Taiwan in virtually all patients. The ITRP spent some time to discuss the need to increase the use of rapid and more sensitive diagnostic tests such as NAAT as the first diagnostic test while limiting the use of smear microscopy. This will not only facilitate timely and rapid TB diagnosis and treatment, but also reduce the work burden on the laboratories.

In conclusion, the national TB response activities, coordinated by TCDC in close collaboration with private clinical facilities supported by the government via national health insurance mechanisms, deliver a high level of TB prevention, care and program management in Taiwan. Traditional tools and most available innovations are implemented effectively with close monitoring of outcomes. Some areas need revisiting, such as the need to augment the systematic use of NAAT in such a way that the number of specimens required to be collected and sent for testing for diagnosis of TB can be reduced to one or two.

[i] B = bedaquiline, Pa = pretomanid; L = linezolid; M = moxifloxacin

ITRP Recommendations

The ITRP acknowledges **great progress of the Taiwan NTP spearheaded by the TCDC.** Having implemented most of the WHO international recommendations and guidelines, the TB response in Taiwan can now be considered a sound model of innovative TB prevention and care in middle-burden, high-income countries. The rapid decline in the TB burden, the major reduction of ongoing TB transmission, and the full containment of emergence of drug resistance are testimony of a highly effective TB response.

Nevertheless, in an era of many public health priorities, competition for funding, and the paradoxical risks linked to the success in rapidly reducing the TB burden in the country, **TCDC needs to advocate incessantly** to ensure ongoing and sustained financing for the TB response. In addition, provision of optimal value-for-money (cost-effective) services must be continuously ensured in the pursuit of ending TB by 2035.

In view of the findings described above, the ITRP developed a series of recommendations that aim at strengthening delivery of TB prevention and care by TCDC and all engaged facilities and partners in Taiwan. The recommendations that follow are structured in two groups: the first five focus on general programmatic challenges while the following seven are directed toward specific TB interventions.

1. **In-depth epidemiological analysis for targeted interventions among the elderly**. In the current context of a rapidly aging society with long life expectancy, a more detailed **analysis of the epidemiological situation among people aged more than 65 years** and of their treatment outcomes - observed to be much poorer in the elderly with a high case fatality rate - is warranted to strengthen care delivery and improve cure rates. Precise assessment of the deaths attributed directly to TB vs those among people with other co-morbidities who die “with TB” is important for the design of proper interventions.
   Also, although it is assumed that most cases of TB in older people occur due re-activation of TB infection acquired in the remote past, it is important to recognise that transmission of TB can occur in the elderly, particularly when they are living in congregate settings. Hence, it is important to include WGS on all cases to identify hot spots of ongoing transmission and intervene to prevent further transmission.
   In addition, **social protection gaps** previously identified need to be regularly assessed and the household’s costs of TB accurately monitored to effectively design mechanisms averting such catastrophic costs and preventing the vicious cycle of “poverty-disease-poverty”.

2. **Operational and translation research for cutting edge innovations**. TCDC should take advantage of the close collaboration with strong local academic institutions to conduct well-coordinated high quality **operational and translational research**, targeting evaluation and introduction of innovative approaches. Validating efficacy and feasibility of new policies will ensure continuous progress. The ITRP also suggests exploiting the successes

of the NTP by publishing the results of research and making the evidence accumulated over years of good practice available to the global scientific community.

3. **TB response coordination and oversight.** Taiwan already implements a unique, well-organised and coordinated TB response with involvement of both public health and clinical institutions. The use of **innovative approaches** to facilitate a coordinated and effective planning, monitoring and surveillance of the TB response could be explored to further strengthen the coordination mechanisms. Tools and methods such as molecular epidemiology coupled with genotyping, use of geospatial mapping, and artificial intelligence (AI)-assisted surveillance and monitoring activities could now be explored and progressively introduced to enhance the strength of the response.

4. **Trained health workforce.** ITRP suggests considering establishment of centres of excellence in collaboration with TMTC for continued education of health care workers and for expert clinical consultations. These mechanisms could be established by expanding the remit of the existing centres of excellence for management of MDR-TB to include other, complex clinical problems related to TB (in particular, patients with important co-morbidities, adverse drug reactions, and drug-drug interactions). In the context of decreasing incidence, health workers may progressively lose expertise in TB recognition. This calls for an effort in designing effective re-training and regular educational interventions. The program should also monitor progress on the adoption of Clinical Decision Support Systems, which in the medium term are expected to become a valuable tool for supporting high quality clinical and public health management of people with TB.

5. **Data analysis and use for action and impact:** While appreciating the data collection and analytical capacity existing at TCDC, ITRP suggests focussing also on strengthening analysis and use of real-time data at the local level to monitor, plan, and implement the TB response.

The following seven recommendations focus specifically on the specific aspects of TB prevention and care.

6. **Clearly defined high-risk groups for screening and case finding (CF):** As only a small proportion of TB patients are notified from the clinics, referral from primary care clinics to secondary or tertiary hospitals is crucial for early detection. It is worth conducting a specific **analysis of case finding delays** to identify potential interventions. In addition, TCDC should quickly establish **clearer definitions of high-risk groups** for active case finding. Furthermore, TCDC should explore the use of geo-spatial mapping and GWS to identify high-burden communities and areas for targeted active case finding. To facilitate diagnosis, TCDC should expand use of ultraportable digital chest x-ray instrument and CAD adopting, as appropriate, artificial intelligence tools for screening of high-risk groups.

7. **Universal use of rapid molecular diagnostic tools for TB diagnosis:** With the evolution of new rapid molecular-based tools (e.g., NAAT), many applied directly to sputum and other specimens, for detection and identification of *Mycobacterium tuberculosis*, for rapid detection of drug resistance, and for molecular/genetic epidemiological studies (e.g., identification of clusters), ITRP recommends to examine, over time, the usefulness and value of older tools (such as smear microscopy, culture, DST and MIRU typing) and to be prepared to modify their role in laboratory procedures when testing specimens received for diagnosis and management of TB. The use of NAAT is recommended because of high sensitivity, short turnaround time and the possibility of differential diagnosis with non-tuberculosis mycobacteria (NTM). ITRP noticed that, given the decreasing TB incidence and the potential loss of expertise among health care workers, as mentioned above, analysis of diagnostic delays with assessment of time between onset of symptoms and care seeking at medical facilities is warranted.

8. **Treatment and adherence:** ITRP recommends expanding **the use of digital adherence technologies** to promote person-centered, supportive care and to reduce the burden on clients and health care services. The current universal DOT policy may need to be reconsidered. While there is a certain number of people who need DOT, it may be advisable to conceive and explore other patient-supporting approaches offering efficient, person-centred care for individuals affected by TB. Such an attempt may result in savings, especially in terms of human resources.

9. **Detection of TB infection and TB preventive treatment (TPT):** Given the known high burden of TB among among HCWs worldwide, ITRP recommends **the use of IGRA at pre-employment screening** to establish a baseline in case of subsequent contact investigations. ITRP also suggests exploring newer antigen-based skin tests as an alternative to resource intense IGRA tests for TB infection testing. In addition, the need for directly observed preventive treatment (DOPT) should be rationalized to avoid overburdening of services while ensuring person-centred support to people administered TPT.

10. **TB among migrants and other risk groups:** ITRP recommends that the practice of pre-migration chest x-ray screening among migrants be maintained and consolidated. The use of IGRA for migrant screening could also be explored as policies evolve. Adding a multilingual function to an electronic DOT system may contribute to treatment adherence of foreign-born TB patients. Finally, to provide optimal care among migrants with TB, it is important to strengthen measures such as elimination of language barriers and provision of information on TB and health services for early case detection, screening, TPT, and other fundamental interventions. It remains important to ensure that legal sanctions and threats of deportation are not deployed in a manner that discourages symptomatic people, who may have TB, from coming forward for diagnosis.

11. **Management of MDR/RR-TB:** As also recommended by WHO, the ITRP **strongly recommends rapid transition** from the old 24-month, injectable-containing regimens to the 6-month BPaL/BPaLM or the 9-month all oral, bedaquiline-containing regimens for

management of MDR/RR-TB. ITRP emphasizes the need **to eliminate the use of injectables** in the management of DR-TB with immediate effect, and to ensure universal use of NAATs prior to initiation of TB treatment to facilitate timely identification of drug resistance and initiation of the proper regimen. The policy of deportation of foreign-born MDR/RR-TB patients should be reconsidered for obvious ethical reasons, but also because it is a disincentive to early consultation thus increasing the risk (i) for the patient to progress unattended towards a serious compromise of respiratory functions and (ii) of transmission in the community.

12. **Laboratory activities:** ITRP believes that laboratory capacity in Taiwan follows the best practice standards. Nevertheless, in the context of decreasing TB incidence, it may be increasingly difficult for a laboratory to maintain high quality of services with smaller and smaller numbers of specimens to be examined. Therefore, consolidation of TB laboratory activities may be considered while securing effective specimen transportation systems. In addition, ITRP recommends to: (i) continue exploring targeted use of culture in diagnosis and management of TB; (ii) consider consolidation of TB culture and reference laboratory services; and (iii) explore targeted use of tNGS and WGS for assessment of transmission and for identification of transmission hot spots.

Annex

Time	Topic/ Speaker	Venue
2024/4/21 (Sun)	**Day 0**	
17:00	**Gather at the Lobby of Sheraton Grand Taipei Hotel**	Sheraton Grand Taipei Hotel
17:00-17:30 (30 min)	Orientation & Chair election **Dr. Chia-Chi Lee** Director, Division of Chronic Infectious Diseases, TCDC	Bei Ping Shang Yuan Lou Restaurant (北平上園樓)
2024/4/22 (Mon)	**Day 1**	
09:50-09:55 (5 min)	**Opening Remarks** **Dr. Jen-Hsiang Chuang, MD, PhD** Director-General, TCDC	TCDC 7th Floor National Health Command Center
09:55-10:00 (5 min)	**Group photo**	
10:00-10:30 (30 min)	Introduction to Health System and Tuberculosis (TB) Public-Private Mix System in Taiwan **speaker: Dr. Hsiu-Yun Lo**	
10:30-10:50 (20 min)	Discussion	
10:50-11:10 (20 min)	*Break*	
11:10-11:40 (30 min)	Current Status of TB Prevention and Control and Main Challenges in Taiwan **speaker: Ms. Chi-Fang Feng**	
11:40-12:00 (20 min)	Discussion	
12:00-13:30	*Lunch*	-
13:30-14:00 (30 min)	TB Surveillance, Diagnosis and Future Trend **speaker: Mr. Po-Wei Chu**	TCDC 1st Floor Conference Room
14:00-14:20 (20 min)	Discussion	

Time	Topic/ Speaker	Venue
14:20-14:50 (30 min)	TB Case Management and Healthcare for Patients with Higher Risk of Unfavorable Outcomes **speaker: Ms. Pei-Ling Chen**	TCDC 1st Floor Conference Room
14:50-15:10 (20 min)	Discussion	
15:10-15:30 (20 min)	*Break*	
15:30-16:00 (30 min)	Patient Support and DOT Service **speaker: Ms. Jen-Jui Chen**	
16:00-16:20 (20 min)	Discussion	
16:20-16:50 (30 min)	DR-TB Surveillance and Management (TMTC Care System) **speaker: Ms. Ya-Chun Yang**	
16:50-17:10 (20 min)	Discussion	
17:30	*Dinner*	-

Time	Topic/ Speaker	Venue
2024/4/23 (Tue)	**Day 2**	
09:00-11:30 (150 min)	Case Management in Hospitals with Visit to Wan Fang Hospital	Wan Fang Hospital
12:00-13:30	*Lunch*	-
13:30-14:00 (30 min)	Active Case Finding Strategies **speaker: Ms.Yin-Yuan Liao**	TCDC 7th Floor National Health Command Center
14:00-14:20 (20 min)	Discussion	
14:20-14:50 (30 min)	LTBI Treatment for TB high risk population (I): Public Health Sector **speaker: Ms. Mei-Yu Chiou / Ms. Nai-Tzu Liu**	
14:50-15:10 (20 min)	Discussion	
15:10-15:30 (20 min)	*Break*	
15:30-16:00 (30 min)	LTBI Treatment for TB high risk population (II): Healthcare Sector **speaker: Ms. Mei-Yu Chiou / Ms. Nai-Tzu Liu / Ms. Yin-Yuan Liao**	
16:00-16:20 (20 min)	Discussion	
18:00-20:00	***Welcome Banquet***	Sheraton Grand Taipei Hotel

Time	Topic/ Speaker	Venue
2024/4/24 (Wed)	**Day 3**	
09:00-11:30 (150 min)	1. The Implementation of TB Control in New Taipei City 2. Visit to New Taipei City Department of Health and Banqiao Public Health Station	New Taipei City Department of Health
12:00-14:00	*Lunch*	Jinghsinyuan (靜心苑)
14:00-14:30 (30 min)	TB Laboratory Program **speaker: Mycobacterial Diseases Laboratory**	SONGSHAN Sanatorium Dormitory (松山療養所宿舍) ※The former Taiwan Provincial Bureau of Tuberculosis Prevention Center
14:30-14:50 (20 min)	Discussion	
14:50-15:10 (20 min)	*Break*	
15:10-15:40 (30 min)	TB Diagnosis: Current Status, Challenges and Future Perspectives **speaker: Mycobacterial Diseases Laboratory**	
15:40-16:00 (20 min)	Discussion	
16:10-17:00 (50 min)	Visit to TB National Reference Laboratory	TCDC TB Laboratory
17:30	*Dinner*	-

Time	Topic/ Speaker	Venue
2024/4/25 (Thu)	**Day 4**	
09:00-09:30 (30 min)	TB Infection Control in Health Care and Congregate Settings **speaker: Ms. Pin-Chi Chen**	TCDC 7th Floor National Health Command Center
09:30-09:50 (20 min)	Discussion	
09:50-10:20 (30 min)	TB prevention and Control on Foreign-born TB **speaker: Ms. Chih-Jung Chia**	
10:20-10:40 (20 min)	Discussion	
10:40-11:00 (20 min)	*Break*	
11:00-11:30 (30 min)	TB Health Education and Development of Human Resources **speaker: Ms. Su-Han Hsueh**	
11:30-11:50 (20 min)	Discussion	
12:00-13:30	*Lunch*	-
13:30-17:30	**Discussion on Preparation for the Report (I)**	TCDC 3rd Floor Conference Room
18:00	*Dinner*	-
2024/4/26 (Fri)	**Day 5**	
09:00-12:00	**Discussion on Preparation for the Report (II)** ※Please provide a preliminary report after the discussion ends.	TCDC 7th Floor Conference Room
12:00-13:30	*Lunch*	-
13:30-16:30	Debrifing to Director-General of Taiwan CDC **The international panel**	TCDC 7th Floor National Health Command Center