Myanmar
Ministry of health, NTP program

Myanmar,
Major Infectious Disease Control Project,
Phase 2,
TB component,
Project Completion Report

March 2015

Japan International Cooperation Agency
Japan Anti-Tuberculosis Association

HM
JR
15-038

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ABBREVIATIONS

3MDGF	Three Millennium Development Goal Fund
BHS	Basic Health Staff
CBTBC	Community Based TB Care
CDR	Case Detection Rate
CHV	Community Health Volunteers
CXR	Chest X-ray
DOTS	Directly Observed Treatment Short-course
DSR	Drug Sellers' Referral
EQA	External Quality Assurance
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
GIS	Geographical Information System
GOJ	Government of Japan
GOM	Government of Myanmar
GP	General Practitioner
HIV	Human Immunodeficiency Virus
IEC	Information, Education, Communication
INGO	International Non-Governmental Organization
IOM	International Organization for Migration
ISTC	International Standard for TB Care
IUATLD	International Union Against Tuberculosis and Lung Diseases
JATA	Japan Anti-Tuberculosis Association
JICA	Japan International Cooperation Agency
M&E	Monitoring and Evaluation
MCCM	Myanmar Country Coordination Mechanism
MCH	Maternal and Child Health
MDG	Millennium Development Goal
MDR	Multi-Drug-Resistant
MIDC	Major Infectious Diseases Control
MMA	Myanmar Medical Association
MOH	Ministry of Health
NGO	Non-governmental organization
NHL	National Health Laboratory
NTP	National Tuberculosis Program
NTRL	National TB Reference Laboratory
OR	Operational research
PDM	Project Design Matrix
PPM	Public-Private or Public-Public Mix
PSI	Population Services International
RHC	Rural Health Centre
SH	Station Hospital (recently name was changed to Station Health Unit)
SHU	Station Health Unit
SOP	Standard Operating Procedure
STLS	Senior TB Laboratory Supervisors
TB	Tuberculosis
TMO	Township Medical Officer
TOT	Training of Trainers

T/S	Township
TSG	Technical and Strategic Group
TSR	Treatment Success Rate
IUATLD	International Union against Tuberculosis and Lung Disease
UNOPS	United Nations Office for Project Services
USAID	United States Agency for International Development
WHO	World Health Organization

Contents

1. Executive Summary

The TB component MIDCP (II) was carried out from 2012 to 2015 with the Project purpose of improving TB control in Yangon and Mandalay Regions. Based on the national prevalence survey in 2009/2010 indicated a need of strengthening case finding. Therefore this project focused on development of model for strengthening case finding as well as strengthening basis of NTP to increase case detection with maintaining optimal treatment outcomes. The former includes drug sellers referral (DSR), community-based TB care (CBTBC), and decentralization of TB microscopy service in Station Heath Units. The latter includes monitoring and evaluation by regular TB evaluation meeting and EQA and operational research for developing effective TB control model. Project areas supported model developments are 6 Townships in Yangon and 5 Townships in Mandalay. DSR was implemented in 5 Townships and CBTBC is in two Townships with the Project support. It has been demonstrated that these models are feasible and has contributed to strengthening case finding.

The experience of CBTBC and DSR in the model area was utilized to develop the guidelines. The experience of CBTBC in Pyinmana Township was incorporated into the guidelines of CBTBC developed by NTP, MOH and WHO. NTP, MOH developed the guidelines of drug sellers' referral with support of the Project.

Therefore the project achievement is expected to contribute to TB control in Myanmar as well as in Yangon and Mandalay. The Project Purpose is to improve TB control in Yangon and Mandalay Region. It should be also noted that the project has contributed the enhanced performance of TB control program in Myanmar by conducting several activities such as regular meetings including partners, enhancing EQA, and training on X-ray diagnosis which contributed to the improved performance of TB control in Yangon and Mandalay Regions and the whole country

2. Background and Overview of the TB component

TB is one of the major public health issues in Myanmar and listed as the third priority disease next to malaria and HIV. In addition, Myanmar is recognized as one of the twenty-two high TB burden countries by World Health Organization (WHO). National Tuberculosis Programme (NTP) in Myanmar adopted Directory Observed Treatment Short Course (DOTS) strategy from 1997. Then, DOTS coverage was expanded to cover the entire country which is comprised of approximately 320 townships by the year of 2003. Even with this remarkable achievement, there remained a challenge of further improvement for case detection and treatment, especially in the urban areas which assumed to be more TB patients. Therefore, Major Disease Control Project (MIDCP) phase 1 and the phase 1 extension phase composed of malaria, HIV, TB components was implemented by Japan International Cooperation Agency (JICA) from 2005 to 2010 and from 2010 to 2012 respectively. Even with this successful achievement, National TB prevalence survey conducted in 2009 revealed that the prevalence of TB is more than we had expected. Therefore, NTP needs to focus on suspecting, diagnosing and treating more TB patients. The situation of TB control in Myanmar is dramatically changing due to the introduction of Global Fund (GF) Round 9 (R9) started from 2011. MIDCP phase 2 (hereinafter referred as the project) was started from 19th March, 2012 with the project period of two yeras.

Concept of our activities is shown below (Figure 1.). According to the National TB prevalence survey, the project gives the priority to activities of case detection measures such as patient referral from the drug sellers, community based TB care and strengthening of the laboratories at the station hospital level. Those activities are implemented under the output 2. Monitoring and evaluation of TB activities such as township and regional evaluation meetings and analysis of EQA data, and operational research which are under the output 1 is the activities in common to back up and strengthen the activities under output 2.

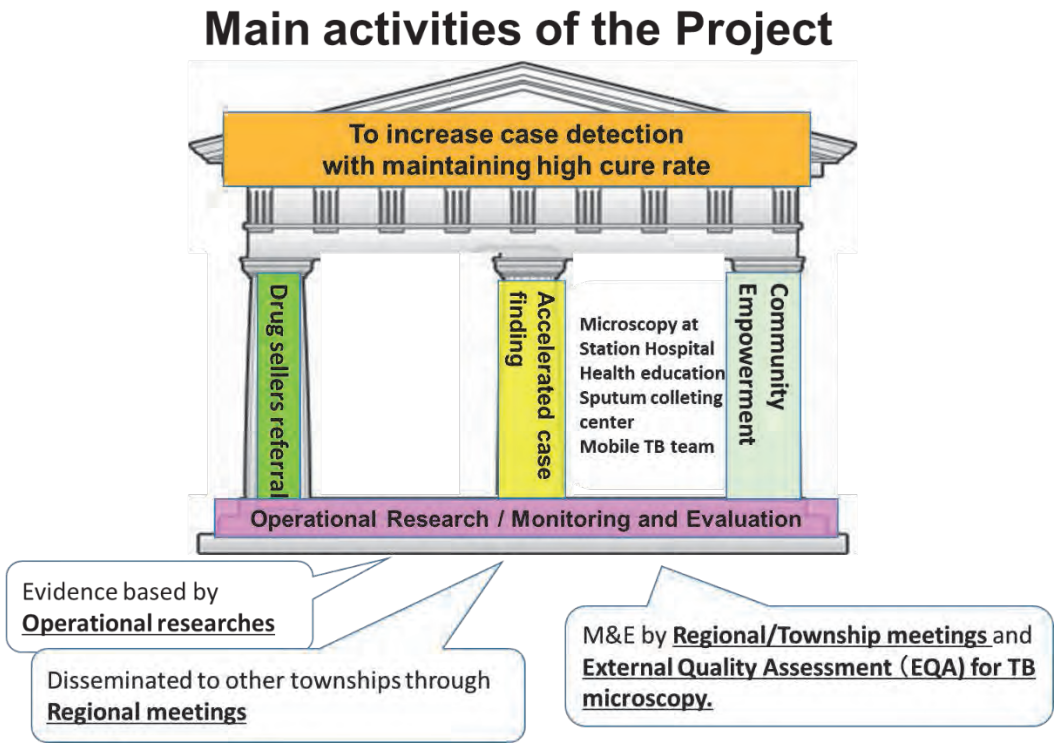


Figure1.

JICA project Townships

Region / Township		Quarterly meeting	Drug Sellers' Referral (DSR)	Community-based TB care (CBTBC)	Peripheral laboratory	Mobile Team
Yangon	Hlaing	✔	✔	✔		✔
	S. Dagon	✔	✔			
	S. Okkalappa	✔	✔			✔
	Taikkyi	✔			✔	✔
	Twan Te	✔			✔	✔
	Kyauk Tan	✔			✔	✔
Mandalay/ Naypyitaw	Pyinmana	✔		✔		
	Maharaungmyae	✔	✔			
	Chanmyatharzi	✔	✔			
	Ngazun	✔			✔	✔
	Nathogyi	✔			✔	✔

2.1 TB Problems

Myanmar is one of the 22 TB high burden countries. TB prevalence is an indicator to measure TB burden in a country and shows the number of prevalent TB patients per 100,000 people. The country conducted National Prevalence Survey from 2009 to 2010 supported by JICA and other partners. It investigated patients' health seeking behavior such as choice of facilities when they had TB symptoms and the type of facilities when they had TB treatment (public facilities like township hospitals or private facilities like private practitioner and pharmacy). This investigation revealed that the TB prevalence rate is declining compared with the previous survey in 1994 although the prevalence remains high as other TB high burden countries and that case finding is low in some areas due to poor access to medical service and TB symptomatic patients seek care first at private facilities such as pharmacy, not medical facilities providing TB services. Thus, the survey showed the importance of strengthening case fining through establishment of TB

diagnostic system in line with patients' health seeking behavior and improving access to TB diagnostic service in non-urban areas where seeking medical care is time consuming.

2.2 Measures taken by the Project

In order to improve case fining by Myanmar National Tuberculosis Program, the Project provided technical assistance in formulating following three major models;

2.2.1 Drug Sellers' Referral: DSR

When drug sellers find their clients (pharmacy user) as TB symptomatic patient, they explain the chance of TB infection to them and refer to township hospital with referral. Township hospitals conduct necessary tests, make diagnosis, and provide treatment if diagnosed as TB. The examination result is fed back to the referred drug seller. The incentive in regards to referrals was not provided.

2.2. 2 Community-based TB Care (CBTBC)

In order to promote case finding in the community, it was necessary to increase the number of Community Health Volunteer (CHV). After government health officers selected and trained CHVs, CHVs provide TB orientation to each assigned community, collect sputum samples from TB symptomatic patients, then deliver those samples to township hospitals with laboratories. The transportation allowance for delivering sputum samples was provided, but other monetary incentive was not provided.

2.2. 3 Microscopy center at Station Hospital

The basic of TB diagnosis is to collect sputum form TB symptomatic patients (usually those with two weeks cough) and find TB bacilli using microscopy (sputum smear microscopy). Considering patients' access to examination and quality of tests, it is recommended internationally that one laboratory should be operated per 100,000 people. In Myanmar, each township has one laboratory in their central health facility but the average population of township is 150,000-200,000. Therefore patients' access to laboratory is not so good especially in non-urban areas. It is necessary to introduce laboratories in fur-flung areas, but the increasing the number of laboratory might risk quality of laboratory examination. Project supported the introduction of laboratories in non-urban areas as follows;

The Project provided technical support in formulating model where Station Hospitals introduce sputum smear microscopy. Training for new laboratory technologists, support in establishing laboratory such as provision of microscopes, and periodical monitoring and supportive supervision to NTP laboratory managers for diagnostics quality were conducted.

2.3 Challenges

2.3.1 Drug Sellers' Referral

There is no precedence in Myanmar regarding Drug sellers' involvement in TB control. Series of discussion were made over active participation of drug sellers and the promotion of their participation. In order for drug sellers to open their business, they need to register in township and renew their registration every three years. Since it was considered that commitment from Township Medical Officer (TMO) might promote patients referral, the project invited drug sellers to not only training but also to advocacy meetings to introduce DSR system under the leadership of township. The meeting helped drug sellers to understand the importance of this referral activity and cooperation from them, leading to the effective DS activities.

It was also considered that involvement of drug sellers will advocate their clients on appropriate medicines even when they are not TB patients. Recently many people become to know that TB treatment is free at NTP facilities due to NTP's media campaigns, leading promotion of referrals.

After one and half years of implementation, some DS in the model area mentioned that he is happy about the activity now.

2.3.2 CBTBC

Initially, CHV was not welcomed very much by the communities and it was considered necessary for CHV to be recognized by public organizations or authorities. The Project asked support about this activity from Local Authority and made effort in the recognition of CHV in the community. In addition, considering collaboration between community and health systems, health officer selected CHV, which helped better relationship among them. Making system where CHVs activities are supported by both health system and political administrative system enabled the Project to overcome the challenges in the CHV recognition by the community and promotion of CHV.

2.3.3 Station Hospital

Since the number of laboratory technologist is not enough, it is inevitable to train new laboratory technologist in order to expand laboratory services. It is preferable to assign laboratory technologists with educational background of specialized training, however, when it's difficult, appropriate officer among current health officer was assigned as laboratory technologist.

Understanding the importance of activities among stakeholders and maintaining their motivation to the activities are common challenges for the above three activities. Since the project considered that it is importance to show the reliable and scientific evidence in relation with those activities before conducting them, the Project made effort to explain each activity and its necessity with scientific evidence, which had a positive impact on outcome of activities and motivation of stakeholders.

2.4 Results

2.4.1 DSR:

In Hlaing Township, presumptive TB and smear-positive TB has significantly increased in number. The number of all forms of TB has not remarkably increased which is probably due to the improvement of over-diagnosis in pediatric TB. As the proportion of TB cases diagnosed among the presumptive TB who were referred by DS, the DSR is thought to be effective in case detection. Based on these experiences, DSR system has been introduced into other 4 townships. Although there were some differences in townships in terms of the contribution of DSR to case detection, the effectiveness of case detection has been commonly observed among the townships. In the final workshop on DSR in Nay Pyi Taw, the discussion took place about how to sustain DSR in the model areas after the termination of the Project and how to expand it to other townships without any special input like the Project.

2.4.2 CBTBC

Without any monetary incentives to CHV, referral of presumptive TB was continuously carried out. In 29 months after launching, there were 286 presumptive TB referred and 73 TB cases were diagnosed. Although it is difficult to exactly compare between pre- and post-intervention because of alternation of administrative districts, an increased TB detection in number by 4% was observed in 2 years. By referring to the results of the Project, CBTBC Guidelines was developed in Nov 2013 in collaboration with NTP, WHO and other organizations involved in CBTBC as the Pynmana Model which was developed by the Project.

2.4.3 Station Hospital

The issue in quality of smear examination was raised in the 4 hospitals out of 5 hospitals. However, with proper allocation of human resource, training, regular monitoring and

supervision, the quality of examinations could be maintained. The number of examinations was depending on the population actually covered by medical facility as well as the population in a jurisdiction. Based on these findings, the policy of expansion of TB laboratory for smear examination was adopted, and the requirements of the selection of station hospitals such as covered size of population and training, monitoring and supervision were listed.

2.5 How to ensure the sustainability

2.5.1 System development within the framework of township and the importance of leadership of township medical officer (TMO)

In the model areas, all activities were carried out within the existing frameworks and under the leadership of TMP who are responsible for health issues. The results of the monitoring which was made by staff members employed by the Project were reported to the TMP as well as the Project. The way is totally different from the one where implementing partners such as other INGO and NGO independently implemented the activities without any collaborative work with township. It was clearly shown that a main player is township staff, not the Project staff who is supporter. As a result, it has influence on not only the sustainability, but also the ownership of the activities.

Strong commitment of the NTP and its promotion: In the monitoring and evaluation of the activities, staff at regional or central level as well as the Project staff was engaged. Both staff of the township and NTP staff made presentations on the activities in the conference for sharing the experiences in the model areas. These made a contribution to strengthening commitment and ownership of NTP staff and ensuring its sustainability.

2.5.2 Limited monetary incentives and performance-based input

DSR: The Project didn't adopt performance-based monetary input based on the number of presumptive TB referred or TB cases detected which other organizations often did, instead of the employment of monitoring staff. Performance-based input may lead to nothing of the activities without any budget allocation. Although the activities might be stagnated when the employment of the monitoring staff is terminated, the network developed by the Project could be maintained and the activities could be sustained. Now that the payment to DS is ensured, the current model that DSR is implemented as one of the township activities is suitable selection.

CBTBC: Although monetary incentives to CHV were provided before the NTP/JICA Project started, monetary incentives and enablers were thought to be not intrinsic because CBTBC should be implemented on a voluntary base. At the beginning, even transportation cost was not covered by the Project. However, because it is not possible for CHV to pay for it from their pocket, the cost is to be covered by the Project as a result of the workshops. As transportation of sputum samples by the CHV is essential in case detection of TB cases, it can be covered by 3 MDG fund through a series of discussion about the cost with TMO and NTP.

2.5.3 Flexible activities after the termination of the Project:

DSR: Feedback of the results of diagnosis and continued stimulation from the township were thought to be of great importance from the interview with DS in Hlaing Township. Advice was made based on the interview with the model township by NTP/JICA and 4 non-model townships which implemented DSR by themselves about their utilization of the existing human resource and some opportunities to implement DSR without any special budget. It was considered effective in DSR that FDA annual meeting where DS participated every year can be used as an opportunity for advocacy activities, new training, refresher training and monitoring, that the feedback of diagnosis can be provided through the presumptive TB him/herself, and that the exiting record forms can be used as recoding forms in order to sustain the DSR activities.

CBTBC: In the model areas, monitoring staff employed by the Project reported the data to the township. However, we found that the records on the referral by CHV were written in the

existing TB register. For this reason, the quarterly monitoring and evaluation can be made by using these existing forms.

2.5.4 Sustaining and expanding the activities by NTP:
As of Year 2014, 5 NTP/JICA townships and 4 townships by themselves carried out DSR, and the National Guidelines in English was developed based on the NTP/JICA model. In the final workshop for dissemination of the Guidelines, the presentations on their experiences in both the model townships and non-model townships were made to discuss how to maintain and expand DSR to other areas.
Shared experiences from the beginning of the Project: Although the issuance of the Guidelines was done in the final year, the Project has tried to share the data and the experiences of DSR in various meetings with the partners from the beginning of the Project. Consequently, it led the fact that 4 non-model township implemented DSR by them and that PSI would implement DSR by Global Fund by using the experiences gained from NTP/JICA model.

3. Inputs

(1) Local Costs and Inputs from the Japanese
1) Operational Cost
As of July 2014, the government of Japan has spent a total of USD 266,361 for the operation of the TB component.

2) Japanese Experts
As of 15 February 2015, two long term experts (TB Control and TB Control/Epidemiology) and six short-term experts (TB Control, Community DOTs, Quality Assurance for Laboratory, Radiophotography, Epidemiology Statistics, TB Control/Epidemiology and CXR Radio Technologist) have been dispatched. The total M/M for Japanese experts in Myanmar was 32.63. (Refer to Annex1)

3) Training in Japan/The Third Country
In total, five officials from MOH have attended the international conferences, as described in Annex 2.

4) Provision of Equipment
Total amount of USD 128,071 was spent for procurement of 1) equipment for diagnosis of TB such as X ray machines, binocular microscopies and fluorescent microscopies and supplies and 2) computers for data management, as described in Annex 3-1, 3-2.

(2) Inputs from the Myanmar Side

1) Inputs for office expenses
- Office space at NPT Latha Office
- Office furniture (desks, chairs, shelves etc.)
- Utility costs (water, electricity etc.)
- Maintenance costs for the office space

2) Inputs for implementation the Project activities

- Relevant counterpart personnel such as regional TB officers, microbiologists, laboratory staff, TMO and TB leaders of the project model townships, and other staff
- Training venues
- Equipment used for the mobile team activities such as X ray machines

4. Activities

The following activities were carried out for Outputs of the Project.

Output 1: Capacity for program management and data management for TB control is strengthened.

Activities	Description of implemented activities
1.1 Carry out operational researches on CBTBC and Drug Sellers' Referral (DSR) based on piloting activities including social mobilization and training	<Operational Research on CBTBC> ・ Operational research (OR) is being carried out to explore a feasible model of CBTBC in Myanmar, and to identify its promoting factors in the selected township, Pyinmana in Nay Pyi Taw. ・ The OR is operated with a concept of action research. Review workshops adopting the participatory approach were carried out in June, October 2012, February and July 2013 and February 2014. ・ Monitoring staff was hired in November 2012 for regular monitoring of the number of presumptive TB referred by CHW and that of patients found among them. ・ The results until August 2012 were analyzed for the presentation in an international conference in October 2012. <Operational Research on Drugs Sellers' Referral (DSR) > ・ OR is being carried out to develop a model and assess its feasibility to increase case finding of TB through referral of persons with presumptive TB by drug sellers in Hlaing Township in Yangon Region. The Project has provided technical support for designing the OR and monitoring the progress. ・ After the commencement of the implementation of referral by the drug sellers in July 2012, monitoring has been done regularly. Monitoring staff were assigned to visit all participating drug sellers once a month to collect data. Forms of referral system, out-patient medical records and TB recording/reporting forms were reviewed. ・ The review workshop was also carried out to assess progress of the model implementation on 30 November 2012, 26 February 2013, 16 May 2013 and 24 January 2014. ・ The results until September 2013 were analyzed for the presentation in an international conference in October 2013.
1.2 Develop CBTBC and Drug Sellers' Referral guidelines and share guidelines, experiences and results with other development partners	The new CBTBC Guidelines incorporating the model was published by MOH and WHO in November 2013. The task of writing up the guidelines was shared by the partners. The Project contributed to the section "Steps for implementation of CBTBC". The NTP/JICA model developed in Pyinmama Township was explained in the guidelines. A guideline on Drug Sellers' Referral for TB Control was published by NTP/MOH and the project in September 2014. Experience of the DSR was shared with partners in the biannual regional evaluation meetings held in Yangon and Mandalay. In February 2015, the dissemination workshop of DSR guidelines was held. State/Regional TB officers, PSI and MMA participated in the workshop. The experience and the results were also shared with partners in JICA project dissemination workshop in February 2015.
1.3 Utilize guidelines for expansion of	Although Guidelines on Drug Sellers' Referral for TB Control had not been published, essential components of guidelines based on the

standardized activities by other fund	NTP/JICA model, were shared as mentioned above. Two Townships in Yangon continued DSR after PSI project was terminated in 2013. PSI, one of the TB partners, started implementing DSR utilizing experience of the NTP/JICA model with Global Fund.
1.4 Monitor and evaluate the standardized activities	Following activities have been done in Pyinmana (CBTBC), Hlaing (DSR and CBTBC), South Okkalapa (DSR), South Dagon (DSR), Chanmyatharzi (DSR) and Maharaungmyae (DSR) Townships. ・ Monthly data collection by monitoring staff ・ Supervisory visits by both NTP staff and the project experts Biannual (region) /quarterly (township) review workshop/meetings for evaluation.
1.5 Train on data and information management such as GIS Training.	Training on GIS was conducted twice. In October 2012 for 30 NTP staff and in August 2014 for 30 regional level staff
1.6 Improve EQA data management at National TB Reference Laboratory	Electronic database for EQA at the central EQA unit has been developed. As a product of EQA data management, the EQA report for the year of 2012 was published with the Project support, so that EQA results are utilized for further improvement of smear examination quality both in the Project Regions (Yangon and Mandalay) and nationwide. It is the 1st National EQA report in Myanmar. The dissemination workshop of this report was carried out by the Project in May 2014. The counterpart has prepared the EQA report for 2013 with advice from JICA expert.
1.7 Present OR results at the international conferences	The results of ORs on CBTBC and DSR were presented at the IUATLD (International Union Against Tuberculosis and Lung Diseases) conference in 2012 and 2013, respectively. The abstracts of the ORs related to active case finding by mobile team, expansion of DSR in 4 townships and EQA system were presented in the World Conference on Lung Health in 2014.
1.8 Develop draft protocol on Second Nationwide TB Prevalence Survey scheduled in 2017	The project expert with experience of technical support for the 1st survey carried out a preliminary analysis of the epidemiologic and TB control situations, which will be utilized for the 2nd survey design, with NTP in May 2014. Because the schedule of next National Prevalence Survey has not been fixed, the technical support focused on sampling, especially sample size calculation tools and recommendation on utilizing newly available technology (laboratory examination and data management).
1.9 Conduct training related to the activities in line with Stop TB Strategy e.g., TB/HIV, chest X-ray, counselling etc.	1) The training for the chest radiophotography operation was provided in September 2012 so that the obtained skills are utilized for computerized X-ray machines purchased by NTP. 2) Training of chest X-ray examination for medical doctors in Yangon and Mandalay Regions was carried out in October 2014. 3) Counseling trainings for BHS were conducted in Mandalay Region for 20 BHS in July 2012 and in Yangon Region for 44 BHS in August 2012. 4) Training of "International Standards for TB Care (ISTC)" was organized in Thinganyun Sanpya General Hospital (40

	participants) in January 2012, Insein General Hospital (41 participants), Yangon West General Hospital (37 participants), Yangon East General Hospital (50 participants) in August 2012 and New Yangon General Hospital (48 participants) in December 2012. 5) Training for senior TB laboratory supervisors on EQA on TB microscopy was conducted in June 2013 for 23 participants.

Output 2: Capacity for TB control is strengthened in Yangon and Mandalay Regions in accordance with Stop TB Strategy.

Activities	Details
2.1 Conduct supervision to station hospitals' sputum smear microscopy	Four supervisory visits to station hospitals in 2012 and 2 visits in 2013 were carried out. Quality of smear examination in 5 station hospitals has been regularly (quarterly) monitored through EQA system. Supervisory visits to 2 station hospitals with a major error detected in Q1 of 2014 were carried out by the chief of EQA center with guidance by Japanese expert. Supervisory visits to 4 station hospitals were made in October 2014.

2.2 Review model of sputum smear microscopy diagnosis at station hospitals and share experiences with other partners	Through the discussion with NTP, 5 Station Hospitals (Tadar, Khatiya and Okkan in Yangon, Ngamyar and Wetlu in Mandalay) were selected for the Project model areas. The results of examinations at the station hospitals were shared and reviewed in the regional evaluation meeting in Yangon bi-annually. In January 2015, the Review Workshop of Microscopic Examination at Station Hospital was held by NTP with support by JICA. In the workshop, both quality of examination and contribution of each Station Hospital to case finding were reviewed. Based on the review, it is decided to expand this decentralization. The experience was also shared with partners in JICA project dissemination seminar in February 2015.

2.3 Organize mobile team activities in high risk group, hard-to-reach areas, urban and peri-urban areas	As a part of model activities for improving accessibility to TB diagnostic service, the Project supported the mobile team for hard-to-reach areas and urban areas. ・ Hlegue Township in September 2012: 873 residents participated. 494 received CXR after checking symptom. Total 40 cases (including 7 smear-positive) were detected. ・ Meikhtila Township in November 2012: 344 residents participated. 324 received CXR. Total 21 cases (including 4 smear-positive) were found. ・ Taikkyi Township in March 2013: 402 residents participated and 359 received CXR. Total 27 cases (including 9 smear-positive) were found. ・ Ngazun in December 2013: 439 residents participated and 398 received CXR. Total 11 cases (including one smear-positive case) were found. ・ Kyauk Se Township: 551 residents participated and 549 received CXR. Total 20 cases were found (no smear-positive case). ・ Ngahtogj Township in March and July 2014: 1232 residents participated and 991 received CXR. Total 16 TB cases including 4 smear-positive cases were found. ・ Hlaing Township in March 2014: 398 residents received CXR. Total 21 cases (including 14 smear positive) were found. ・ South Okkalapa Township in July 2014: 711 residents participated and 531 received CXR. Total 23 TB cases (including 11 smear positive) were found. ・
2.4 Introduction and expansion of the activity of CBTBC and Drug Sellers' Referral	<Drug Sellers' Referral> DSR has been expanded into South Dagon and South Okkalapa in Yangon, Mahaaungmyae and Chanmyathazi in Mandalay since 3rd Quarter of 2013. The Project's support has covered preparation and conducting of initial advocacy meetings and trainings ・ Baseline surveys of these townships were carried out in South Okkalapa and South Dagon in February 2013 and in Mahaaungmyae and Chanmyathazi in May 2013. ・ Advocacy meeting and training for drug sellers were carried out in South Dagon on 7 May 2013, in South Okkalapa on 8 May 2013, Mahaaungmyae on 16 May 2013 and in Chanmyathazi on 16 May 2013. 51 out of 62 drug sellers registered in South Dagon, 51 out of 124 in South Okkalapa, 48 out of 100 in Mahaaungmyae and 62 out of Chanmyathazi were trained for DSR. <CBTBC> CBTBC has been introduced in Hlaing Township as CBTBC in urban setting since June 2013. 20 community volunteers were selected and trained in February 2013.
2.5 Organize TB meetings for Monitoring & Evaluation of township (Regional TB Evaluation Meeting) and for coordination/	Regional TB Evaluation Meetings for M&E and enhancing coordination/collaboration with partners, such as PSI and MMA, as well as Township Health Department, are held twice a year. The meetings provide opportunity of sharing experience of the Project.

collaboration with partners	
2.6 Carry out quarterly TB meetings at township level for further improvement of case finding and case holding	The township TB Quarterly Meetings has been conducted for enhancement of M&E, improvement in case detection and case holding together. In 2012 quarterly meetings were carried out in townships with low achievement, and from 2013, they were extended to the 11 project area townships. The situation of case finding and holding are reviewed by peripheral health facility staff as well as township staff. Technical advice is provided by Regional staff and the Japanese experts.

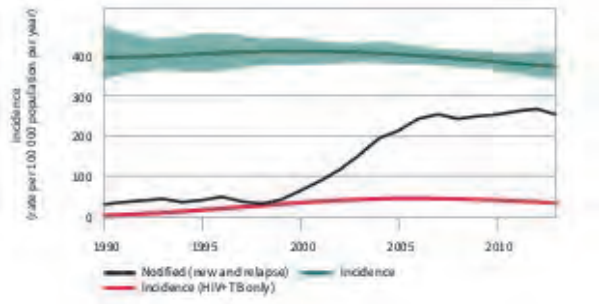
4.1. Achievements and related activities

Background epidemiological situations of TB in Myanmar

To evaluate the outputs and activities of the Project, the epidemiological situations of TB in Myanmar should be taken into account.

According to the estimation by WHO, the national average of incidence rate has been halted and already reversed since 2010.

Trend of Estimated Incidence and Case Notification Rate in Myanmar



(Source: WHO Global TB Report 2014)

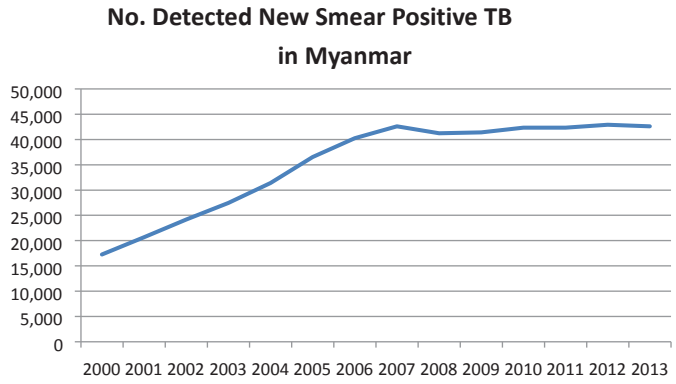
As the reality, the number of new smear-positive TB decreased and case notification rate also slightly declined in 2013 after showing the plateau for certain years. Other factors such as increased number of TB suspects with decreased positive rate among suspects might support the decreased incidence of TB and there is possibility that real incidence is less than that of WHO estimation, resulting in under-estimation of CDR. Thus, the stagnation of new smear positive TB notification rate may be favorable sign due to the efforts made by the NTP, such as early case finding which can lead to reduction of smear-positive cases.

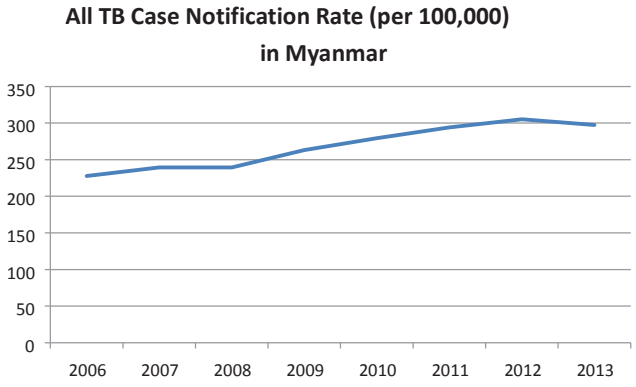
In addition, there is possibility that decreased case notification rate of all forms might be partly due to improvement of child TB diagnosis (reduction of over-diagnosis), because in 2013 the number of non-child cases (aged 15 years or over) did not decrease, while child TB cases did. This may indicate the real case notification rate is still increasing. As the JICA expert recommended in Annual National Evaluation Meeting in May, it is necessary to monitor the trend not only for total (all age groups) but also separately for childhood and non-childhood cases and to observe case detection for a longer period because some fluctuation can occur.

In NTP, the estimated incidence rate to sub-national level is unchanged since 2011. Therefore there is possibility of under-estimation of CDR. Considering complexity of estimating incidence rate in sub-national levels, following the international recommendation, it has been already

decided that CNR instead of CDR is used as a primary indicator of case finding while both of them are used currently as transitional period.
Thus, there are some difficulties in proper evaluation of some of indicators of the PDM regarding CDR.

In addition to these issues regarding CDR itself, NTP revised the case definition in 2014 following the WHO recommendation. Smear-positive was replaced by bacteriologically confirmed cases (consisting of not only smear positive but also other bacteriological test positive). In the following assessment, bacteriologically confirmed cases are assumed to be smear positive cases. While most of new cases are diagnosed by smear examination, Gene Xpert is applied to HIV co-infected cases. Therefore regarding smear positive TB cases, some overestimation of increase may need to be considered.





4.2 Achievement of Project Outputs

1) Output 1

Output 1	**Capacity for program management and data management for TB control is strengthened.**
Indicator 1	10 townships utilizing developed guidelines of either CBTBC or Drug Sellers' Referral to expand the related activities
Indicator 2	90% of the laboratories with no major error on quarterly basis through utilizing EQA annual report in Yangon and Mandalay Regions

The Output 1 is considered to have been achieved.

Indicator 1

Currently, CBTBC is implemented in 26 out of 28 townships in Mandalay and 5 out of 44 townships in Yangon regions by various organizations. The Project support CBTBC implemented in Pyinmana Township in Nay Pyi Taw and Hlaing Township in Yangon. The CBTBC guideline was published by MOH and WHO. It was created based on the findings presented in the workshop in February 2013, which included the NTP/JICA model in Pyinmana Township. The guidelines is used in Hlaing Township and also applied nationwide in CBTBC by other organizations. Therefore it is considered that practically CBTBC based on the guidelines are widely expanded even if the number of CBTBC has not been increased.

The Guidelines on the Drug Sellers' Referral for TB Control based on the experience in NTP/JICA DSR model area (Hlaing Township) was published in September 2014 and are utilized in 5 townships (2 in Mandalay and 3 in Yangon) covered by the Project.

Four townships have been implementing DSR by their own efforts. Two of them succeeded DSR carried out by PSI in 2012-2013 and the others initiated DSR by themselves. The Project visited them and provided advice from some core component (e.g. importance of feedback, recording/reporting for monitoring) of guidelines. PSI, one of implementing partners with NTP, started DSR with Global Fund by utilizing the experience of NTP/JICA model area.

NTP disseminated the guidelines for further expansion through the workshop inviting State/Regional TB officer and have decided to incorporate the monitoring of DSR activities at Region/State level and at national level and print essential recording/reporting forms based on the guidelines for maintaining and expansion of DSR.

Based on these achievements, it is considered that practically this indicator has been fulfilled.

Indicator 2

In both Mandalay and Yangon Regions, the percentage of laboratories with no major errors has been in upward trend from 2011 to 2014 as shown in the graph. In the first quarter of 2014, 93% (56 out of 60) of laboratories in Mandalay and 95% (62 out of 65) of those in Yangon operated without major errors. Thus, this indicator reached the target while some fluctuation is observed.

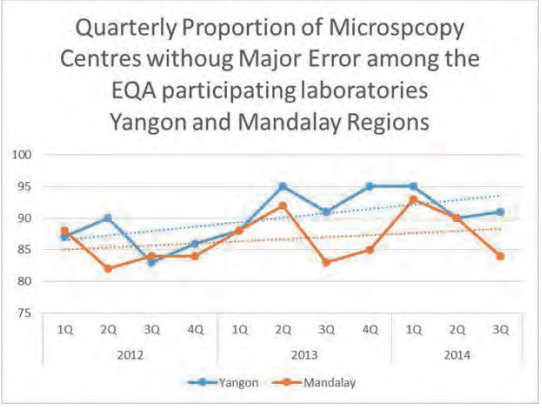
In addition, improvement in program and data management skills is exemplified by the publication of the 1st annual EQA report. This effort required not only the nationwide data collection management, but also the analysis and synthesis to the data collected.

Results of EQA without major errors in Yangon and Mandalay Regions

Period	Yangon Region		Mandalay Region	
	Laboratory participating in EQA	Laboratories without Major Errors among the participating laboratories (%)	Laboratory participating in EQA (%)	Laboratories without Major Errors among the participating laboratories (%)
2012 1Q	60	52 (87)	56	49 (88)
2Q	61	55 (90)	56	46 (82)
3Q	63	52 (83)	57	48 (84)
4Q	64	56 (88)	56	47 (84)
2013 1Q	64	56 (88)	59	52 (88)
2Q	64	**61 (95)**	60	55 (92)
3Q	66	**60 (91)**	59	49 (83)
4Q	66	**61 (95)**	61	52 (85)
2014 1Q	65	**62 (95)**	60	**56 (93)**
2Q	68	**61 (90)**	58	**52 (90)**
3Q	67	**61 (91)**	58	49 (84)

#the numbers indicate number of laboratories with no major errors/number of laboratories participated in EQA (%)

Trend of proportion of microscopic centers without major errors



Dotted lines indicate trend based on liner assumption (fitted by Excel 2013).

2) Output 2

Output 2	Capacity for TB control is strengthened in Yangon and Mandalay Regions in accordance with Stop TB Strategy.
Indicator 1	90% of the laboratories with no major error on quarterly basis through utilizing EQA annual report in Station Hospitals
Indicator 2	TB suspect examination by drug sellers in project areas is increased by 10%
Indicator 3	TB suspect examination by community volunteers in project areas is increased by 5%
Indicator 4	Case detection by drug sellers in the project areas is increased by 5%
Indicator 5	Case detection by community volunteers in the project areas is increased by 5%

The Output 2 is considered achieved, although only one indicator (indicator 1) is likely to reach the target. For other indicators regarding CBTBC and DSR, it is difficult to evaluate exactly whether they reach the target, due to several reasons such as short term of the interventions and special conditions which might affect the results of interventions. However, considering other effect, these interventions could produce the positive effect for TB control.

Indicator 1
<Status of output>
The project has provided support to introduce TB microscopic examination into station hospitals to improve access to TB diagnostic service in 3 in Yangon and 2 in Mandalay. In these regions, total 10 Station Hospitals implemented TB microscopic examinations.

Table 2: Number of MC at station level in Yangon and Mandalay Regions

Year	Region	Q1	Q2	Q3	Q4
2012	**(Total)**	**(6)**	**(8)**	**(9)**	**(9)**
	YGN	4	4	5	5
	MDY	2	4	4	4
2013	**(Total)**	**(9)**	**(10)**	**(10)**	**(10)**
	YGN	5	5	5	5
	MDY	4	5	5	5
2014	**(Total)**	**(10)**	**(9)**	**(10)**	**(8)**
	YGN	5	5	5	4(*1)
	MDY	5	4(*2)	5	4(*3)

As shown the table, Yangon region started to set up station level of MC with 4 centers in 2012 and gradually expanded to 5 centers by 3Q of 2012. However at the 4Q of 2014, one MC (Khathtiya station hospital) has no microscopy service done due to no laboratory technician. Therefore 4 centers operated in this quarter (*1).

Mandalay region started to set up station level of MC with 2 centers in 2012 and gradually expanded to 5 centers by 2Q of 2013. However since due to internal trouble involvement in the area where Kyatpyin station hospital covers, no patient visited and consequently no EQA slides submission occurred and the number of MC for EQA participation was 4 centers at 2Q 2014(*2). Due to resigning of laboratory technician at Wetlu station hospital in 4Q of 2014(*3), TB microscopy service has been stopped (indicating in red color). This problem of vacancy was solved and TB microscopy service has been started again since January, 2014.

Results of EQA in 5 station hospitals which initiated TB microscopy with the project support

Year	Q1	Q2	Q3	Q4
2011	2/2 (100%)	2/2 (100%)	2/2 (100%)	2/2 (100%)
2012	2/3 (67%)	5/5 (100%)	4/5 (80%)	4/5 (80%)
2013	5/5 (100%)	4/5 (80%)	5/5 (100%)	4/5 (80%)
2014	3/5 (60%)	4/5 (80%)	4/5(80%)	2/3(80%)

#The numbers indicate number of laboratories with no major errors/number of laboratories participated in EQA(%)

The above table shows EQA results from the 5 Station Hospitals supported by the project; Oakkan (Taikkyi), Tada (Kyauktan), Khatiya (Twantay), Namyar (Ngazun), Wetlu (Nagtogyi). Given it reached 100%, it could be assumed the target level is achieved while some fluctuation is observed due to a small total number (one microscopy centre result in 20%). It is observed major error tend to occur frequently in one center. The reason or background of this phenomenon must be identified and improved by collaboration and with concerned persons.

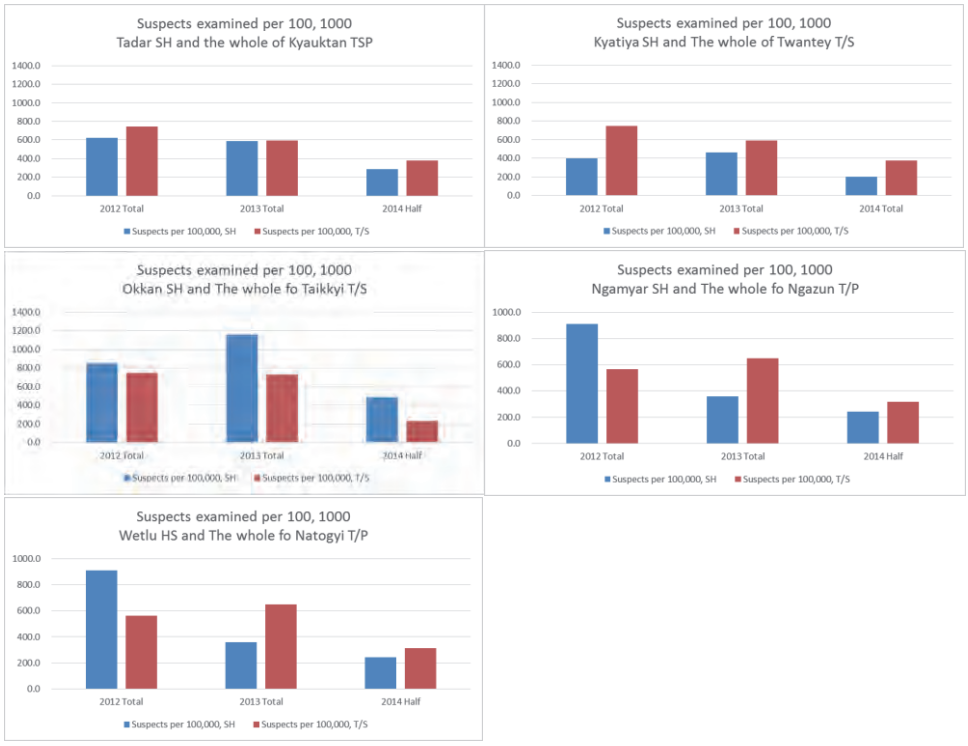
Year	YANGON			MANDALAY		
	Total MCs	MCs with No ME	%	Total MCs	MCs with No ME	%
2012						
1Q	4	3	75	2	**2**	**100**
2Q	4	**4**	**100**	4	**4**	**100**
3Q	5	4	80	4	**4**	**100**
4Q	5	4	80	4	**4**	**100**
2013						
1Q	5	**5**	**100**	4	**4**	**100**
2Q	5	**5**	**100**	5	3	60
3Q	5	**5**	**100**	5	**5**	**100**
4Q	5	**5**	**100**	5	3	60
2014						
1Q	5	4	80	5	4	80
2Q	5	4	80	4	**4**	**100**
3Q	5	4	80	5	**5**	**100**
4Q	4	2	50	4	3	75

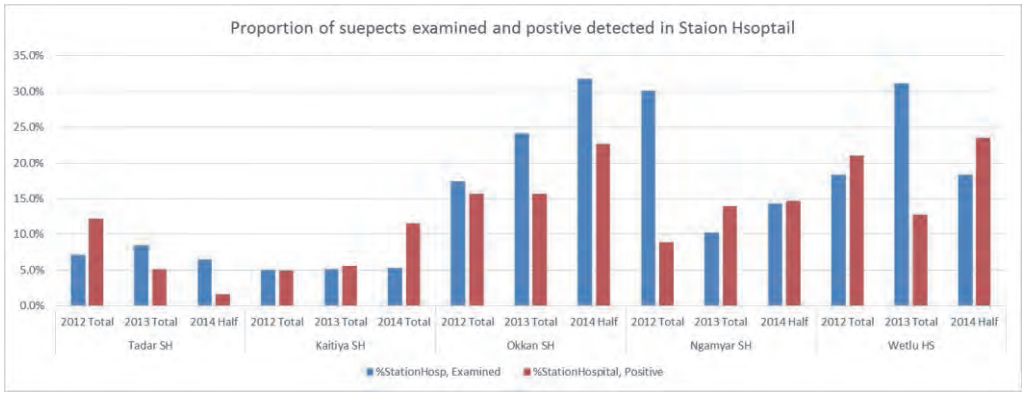
The above table includes not only Station Hospitals which initiated with the project support. At regional levels, it reached target in some of quarters. It is considered that the target level is achieved while some fluctuation is observed.

<Review of Microscopic Examination at Station Hospitals and direction of utilizing SH in future>

The reason for introducing microscopy service at Station Hospitals is to improve access to TB diagnosis in rural settings. The review workshop of microscopy examination at Station Hospitals was held in January 2014. In the workshop, both quality of laboratory, as mentioned, and situation of case finding activities in Station Hospital were reviewed to decide direction of utilizing Station Hospitals for TB diagnosis. The TB suspect examination rate in Station Hospital and the whole of Township, and contribution to case finding in the 5 station hospital is shown in the below figures. Compared to the whole township, Okkan continue to have higher examination rates. This is related to real coverage of population utilizing this centre larger than

official population in the catchment areas. In Nyamar SH and Wetlu HS, during the initial phase, it was higher in SH. It may indicate there were patients with delay and utilized the station hospitals. The contribution of station hospital to case finding in the whole township was assessed by proportions of TB suspects and detected smear-positive cases. While there is a certain level of variation, it appears that 5% is expected at minimum. This proportion is associated with size of actual population utilizing a station hospital.





The workshop adopted the following conclusions. It is decided to expand decentralized TB Microscopy Centre at Station Hospitals.

I. Decentralized TB Microscopy Center at Station Health Units will be expanded based on the experience of JICA model using different funding sources.

II. Selection criteria for expansion of MC at station hospital level, Coordination Meeting are needed.

1. X ray / Lab facilities and Lab technician are in place.

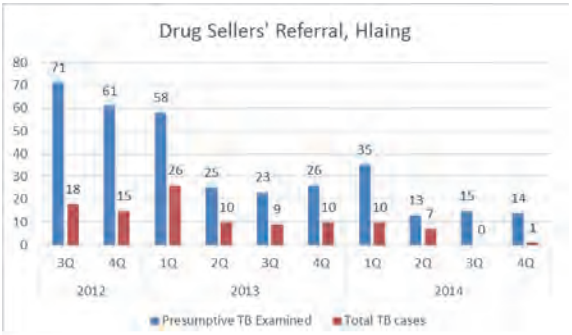
2. Inaccessible, long distance from township.
3. Population coverage and drainage area.
4. Strong commitment with R/S Health Directors.
5. High utilization of Station Hospital.
6. Strong linkage with implementing partners.

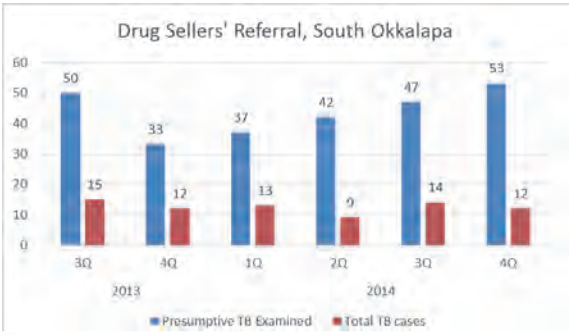
III Implementation process (40 SHU/ year)

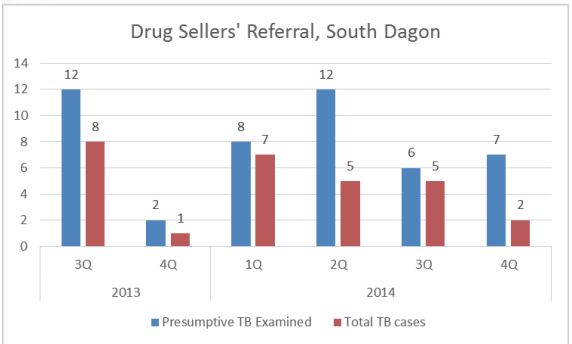
1. Advocacy meeting for value of MC
2. Training for Lab technicians/ Microscopists from SHU (Printing of Training materials, Guidelines, Wall Poster, EQA form)
3. Supervision (quarterly basis)
4. Evaluation meeting
5. Transportation cost from station to township/State and Region
6. Infection Control
7. Equipment and material supplies

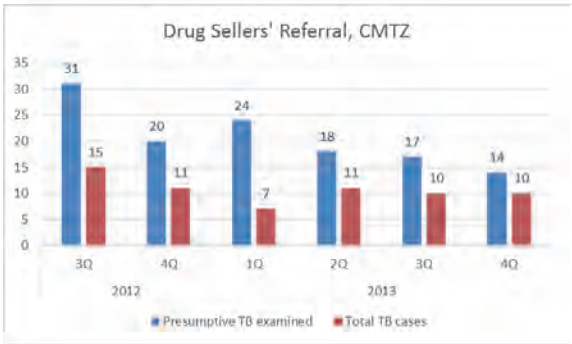
Indicator 2

In 5 townships with the DSR project (Hlaing, South Dagon, South Okkalapa, Chanmyatharzi and Maharaungmyae), only in 1 township the number of TB suspects referred by drug sellers steadily increased while in other 4 townships the number was the highest at the beginning of the intervention then decreased. Thereafter, the number remained stable or increased again. These results indicate that the indicator is considered not achieved. However, generally this phenomenon happens as pooled under-covered TB cases or suspects are cleared at the beginning of the interventions. Also the short periods of the interventions make exact evaluation difficult. Thus, at this moment, the exact evaluation on this indicator is impossible, while this DSR has contributed to TB suspect management significantly, considering the number of suspects referred by DSR.





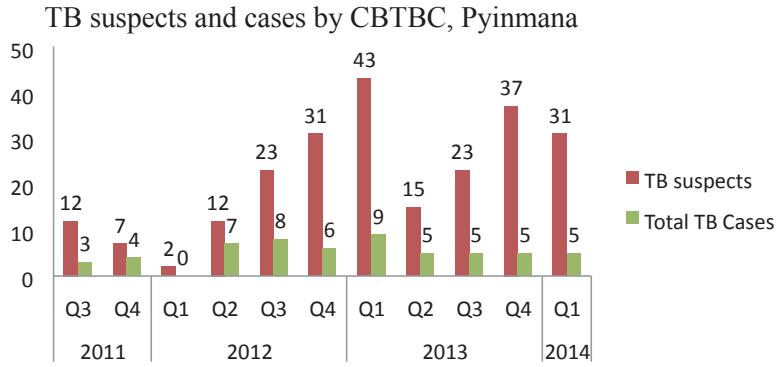




Indicator 3

Administrative area of Pyinmana Township, the NTP/JICA CBTBC model area, was changed just after the initiation of CBTBC. Therefore, it is not possible to compare the number of TB suspect examinations. To see the change, data of the 1st year of implementation is used as baseline. The number of TB suspects referred by CBTBC nearly doubled in 2013 compared to that of 2012. Thus, in Pyinmana, this indicator reached the target.

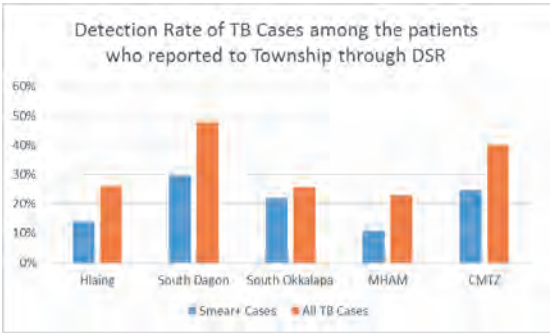
In Hlaing Township, the intervention has started from June 2013. The number of suspects during 3Q of 2013 and 4Q of 2013 and 1Q of 2014 was 8, 9 and 12. Therefore during this 9 month period, increase was observed while the number dropped after this period.



Indicator 4 (refer the figures for the Indicator 2)

The same phenomenon as the number of TB suspects happened for the TB cases detection by DSR. The number tended to be the highest at the beginning of the interventions and only in 1 Township, the number has steadily increased during the period. For this indicator, the evaluation is same with that for the indicator 2.

In addition to the indicators, to see efficiency of the case detection through DSR, the proportions of TB cases diagnosed among patients referred by drug sellers is assessed in the five project areas. For all TB cases, they are 26% in Hlaing, 48% in South Dagon, 26% in South Okkalapa, 23% in Maharaungmyae, and 40% in Chanmyatharzi. These observations might suggest high efficiency of detecting TB cases through DRS. It may also indicate that DSR can contribute to reduction of delay.



Indicator 5

In Pyinmana Township as in the Figure in the indicator 3, the number of all form of TB cases detected by CBTBC has increased by 14% in 2013 compared to that of 2012. Thus, this indicator seems to reach the target.

In Hlaing Township, the number of all form of TB cases detected by CBTBC was 11, 6 and 4 during first 7 months, next 6 months and another next 6 months. Since the number of cases was larger in early phase, this indicator did not yet reach the target. However this phenomenon happen as pooled under-covered TB cases or suspects are cleared at the beginning of the interventions as mentioned above in the above Indicator-2. In the workshop, the Project experts requested CHVs to provide information on patients referred by them. They helped the patients who had difficulty of visiting health facilities. The finding may be consistent with this situation.

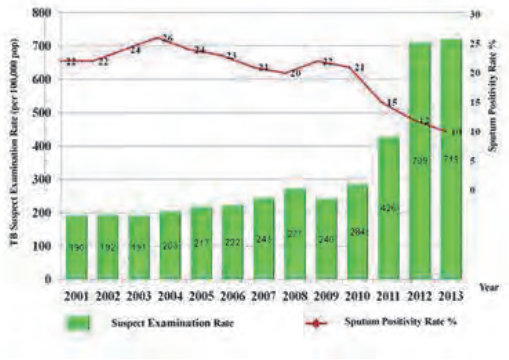
4.3 Project Purpose

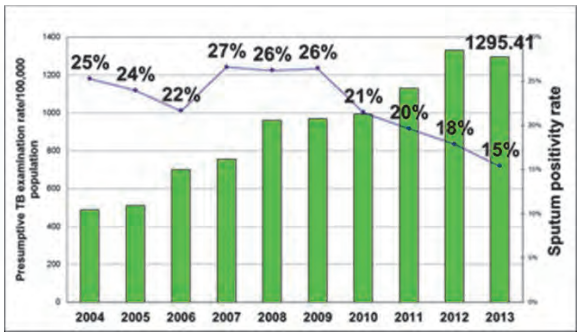
Project Purpose	**TB control in Yangon and Mandalay Regions is improved.**
Indicator 1	More than 70% in Case Detection Rate (CDR) and more than 85% in Treatment Success Rate (TSR) are achieved or sustained in implementing Townships by year 2015.
Indicator 2	Case detection in implementing Townships by Drug Seller Referral is increased by 3.2%.
Indicator 3	Case detection in implementing Townships by CBTBC is increased by 3.2%.
Indicator 4	TB suspect examination in implementing Townships in Yangon and Mandalay Regions is increased by 10%.

The Project Purpose is considered achieved because the three indicators are considered to have reached respective targets.

<Overall performance of TB control related to Indicator 1 and 4 at Regional Level>
Overall performance of the TB control in Yangon and Mandalay has been improved as follows.

<TB suspects>

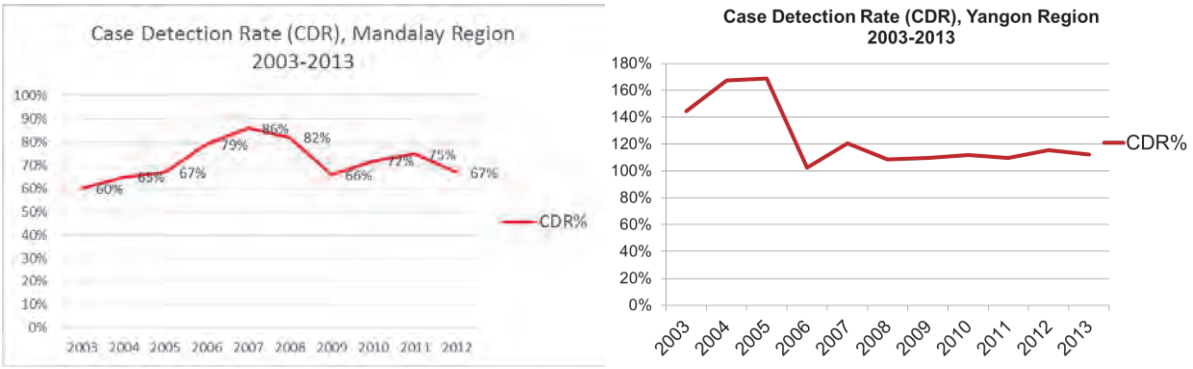




(Source: Annual TB Evaluation Meeting, 2014)

In Mandalay, the TB suspect examination rate increased by 68% from 2011 to 2013 (from 426 to 719), which is considered to reflect increase in case finding efforts as well as improvement of reporting. In Yangon, TB suspect examination rate has been already increasing since 2005, and by 2013, it grew from 509 to 1295 (154%). The growth from 2011 to 2013 was 14% (from 1,129 to 1,295).

<CDR>
CDR in Mandalay and Yangon Region

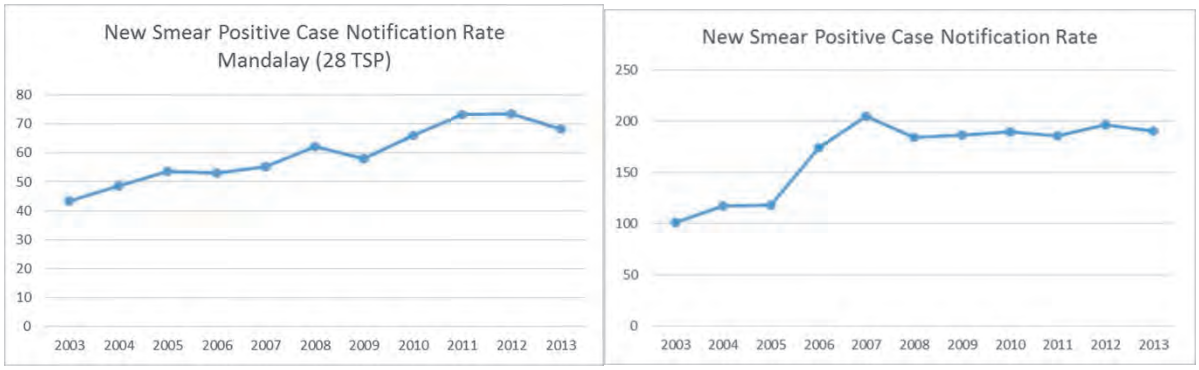


(Source: Annual TB Evaluation Meeting, 2014)

In Mandalay, CDR reached the target (70%) in 2011 (72%) and in 2012 (75%), but declined to 67% in 2013. Provided that the reported TB suspect examination rate has drastically increased in the past few years (from 284 per 100,000 population in 2010 to 718 per 100,000 population in 2013) and sputum positive rate has been decreasing (from 21% in 2010 to 10% in 2013), it is assumed that the TB control efforts have been improved and contributed to the reduction of positive cases which led to the stagnant.

In Yangon, CDR has been over 100% since 2006. Given the TB suspect examination rate has been steadily increasing, while sputum positive rate has been decreasing (from 21% in 2010 to 15% in 2013), it is assumed that the TB control efforts have been improved.

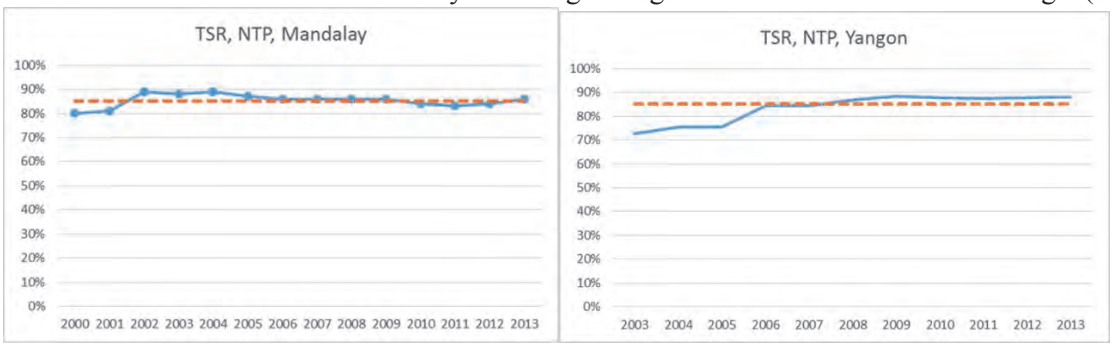
Because the incidence estimates was revised, long term trend of CDR is not easy to see. When we observe trend of New Smear Positive Case Notification Rate increase in TB cases is stagnated or observed some decrease in 2013 following significant increase. However presumptive TB examination rate had shown increase even during the stagnation period and smear positivity rate of examined presumptive TB decreased. The observation from CNR is consistent with that of CDR.



(Source: NTP TB surveillance data)

< TSR>
In Mandalay, TSR reported in 2013 was 86% for the patients registered in 2012. It has reached the target (85%) and been keeping the same level since 2002. In Yangon, in 2013 the TSR was 86% for the patients registered in 2012, which has reached the target.

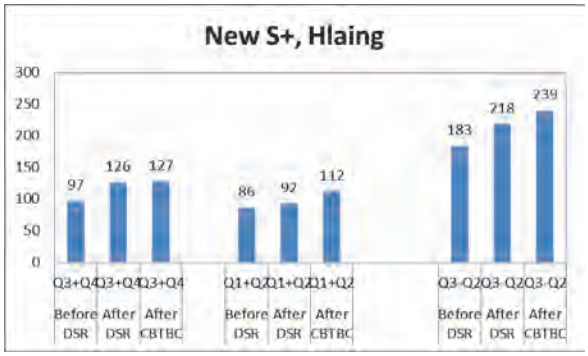
Treatment Success Rate in Mandalay and Yangon Region: Dotted lines indicate the target (85%)

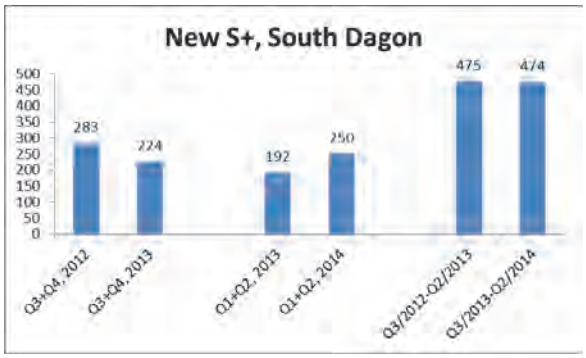


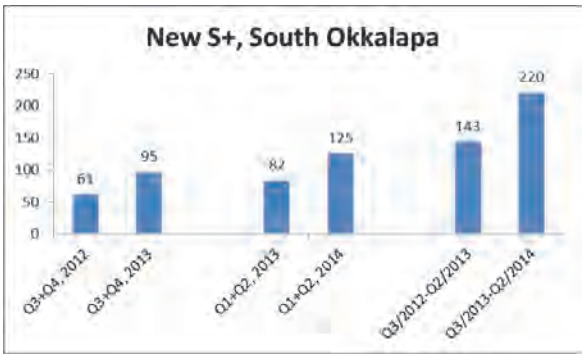
(Source: Annual TB Evaluation Meeting, 2014)

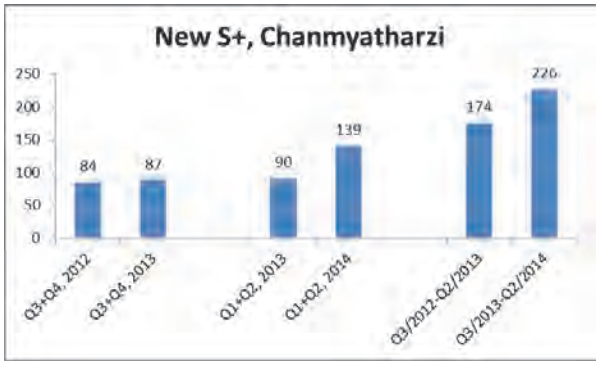
<Achievement of Township Level>
Indicator 1

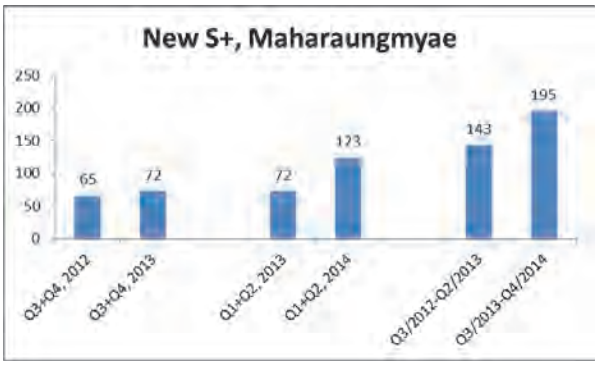
As there might be some variation in incidence rate, basic data used for calculating CDR by township, it is difficult to evaluate this indicator exactly. Considering actual number of notified TB cases, this indicator has been partially achieved, as the number of notified new positive TB cases, which corresponds to CDR, increased in 5 of 6 townships where DSR system and/or CBTBC were implemented by support of the project.







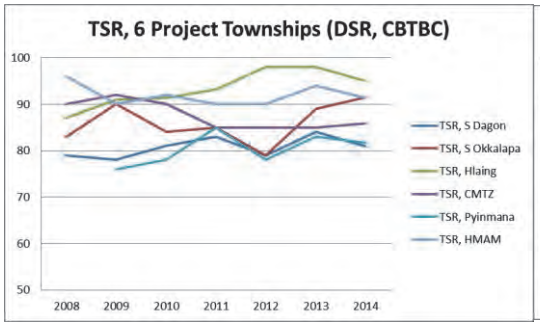


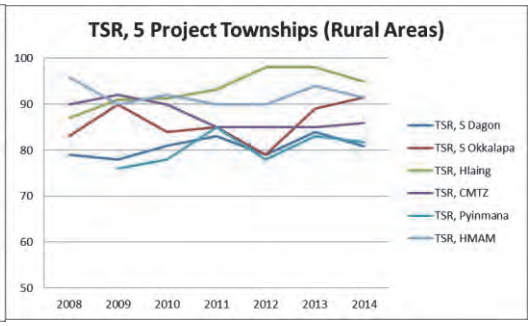


For TSR, according to quarterly reports, if we see the results of 2014 (cases registered in 2013), the most recent annual results, which have not been yet officially confirmed by NTP, 8 out of 11 project townships have TSR meeting the target. South Dagon (TSR: 81%), Pyinmana (TSR: 82%) and Natogyi (TSR:84%) have TSR lower than the target. In Natogyi, TSR shows fluctuation (68 % in 2011, 89% in 2013, 84% in 2013). It is partly because Natogyi has smallest number of TB cases (New Smear positive cases in 2013: 55) among the 11 township. In 2014, the number of death cases was 6 out of 55 (11%), contributing to TSR below the target. Through discussion with BHS at the meeting, it is considered that medical complication is often associated with death. In Pyimnan, while TSR has not yet reached the target yet, the trend of TSR is upward as shown in the figure. At the review workshop, it is suggested that failure is often associated with alcohol use and also some of occupations such as requiring work at night time. The positive finding is defaulter rate is low except in South Dagon. In South Dagon, high defaulter rate (9%) is related to mobile population. In the workshop, BHS mentioned that defaulter cases moved out without informing BHS while they instructed them to do so. South

Okkalapa had the same problem before. However recently mobile populations are reduced in South Okkalapa and have moved to South Dagon according to TMO. It might result in increase in TSR in South Okkalapa and decrease in South Dagon. Based on the observations, it is considered that TSR indicator almost achieved the target while the results suggest a need of strengthening TB service for mobile population and other high risk group.

TSR, Project Townships

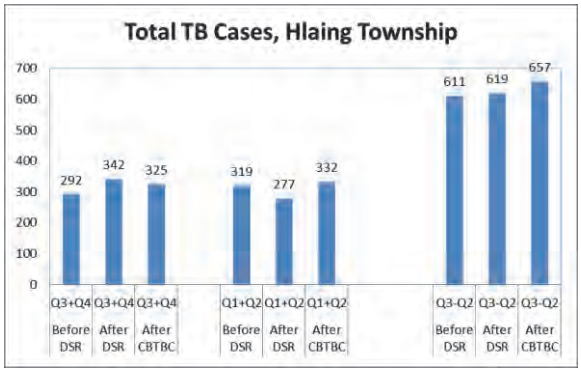


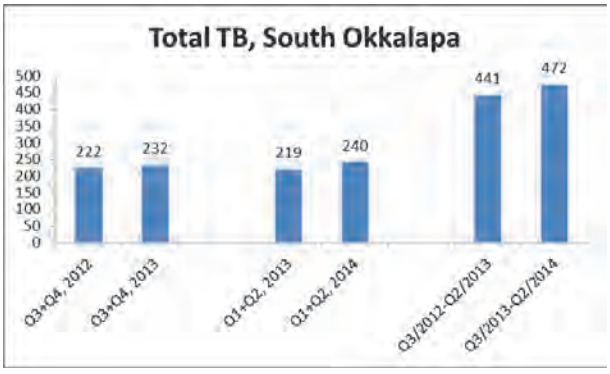


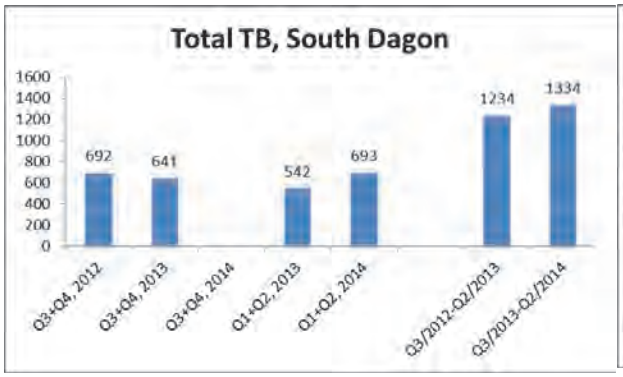
Indicator 2

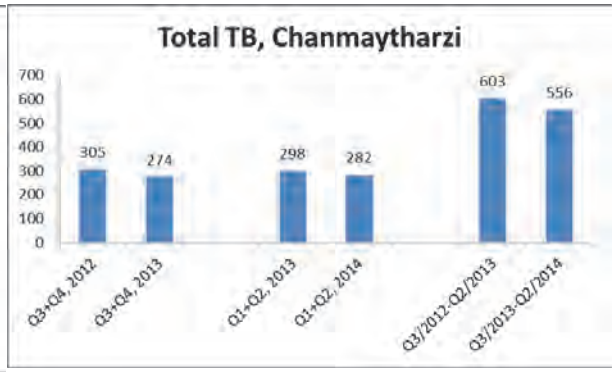
As for the indicator 1, the evaluation was done by the number of new smear positive cases, instead of CDR. Thus, to avoid duplicated evaluation, for this indicator, the number of all form of TB cases is used. Therefore this indicator was not planned at the time of deciding the indicators. When we compare one year period before/after introduction of DSR, only two of five Townships, South Dagon and South Okkalapa, have increase in all TB cases by 5%. In Hlaing Township in Yangon where DSR has been implemented, detected cases of all form of TB grew by 6.1% respectively from the 3rd quarter 2011-the 2nd quarter 2012 to the 3rd quarter 2013-the 2nd quarter 2014. Although there must be combined effect by CBTBC, the indicator seems to reach the target in this Township.

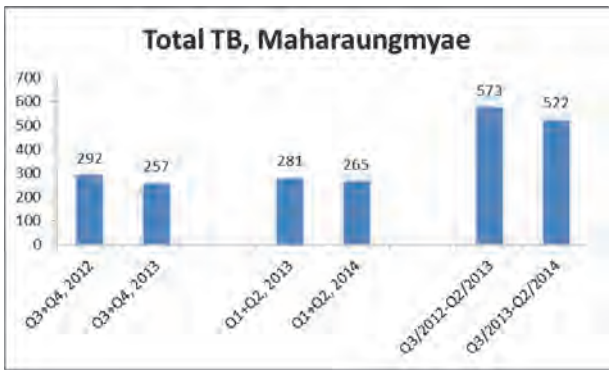
Based on the findings, this indicator has not reach the target, but the interpretation of these results seems to be complicated. The interpretation should be carefully done as the reduction in all TB forms may be due to the improvement in diagnosis of the child TB cases (reduction of over-diagnosis of child TB cases).









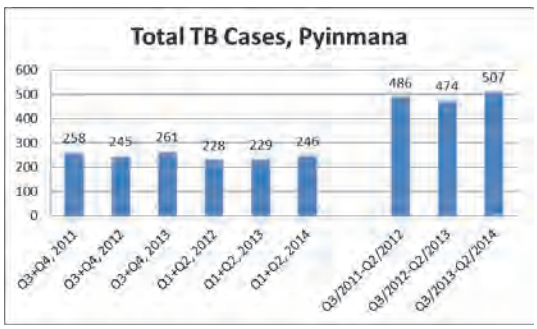


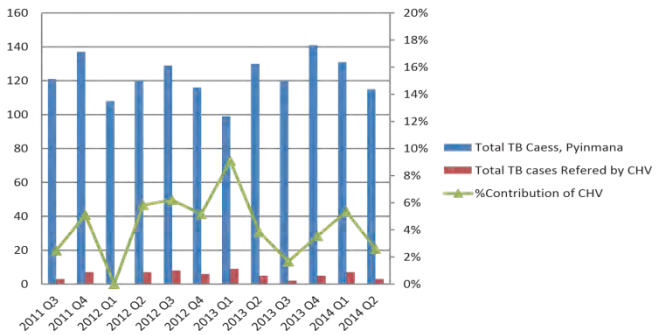
Indicator 3

For this indicator, the number of all form of TB cases is used.

The Project supported NTP to conduct CBTBC in 2 Townships, Pyinmana and Hlaing to develop a CBTBC model that is integrated in the Township health service. The number of all form of TB cases increased by more than the target after initiation of CBTBC in Hlaing township, as in the figure in the previous section, although this is attributable to combined effect by DSR an CBTBC and exact effect of CBTBC on increased number of new all form of TB cases remains unclear.

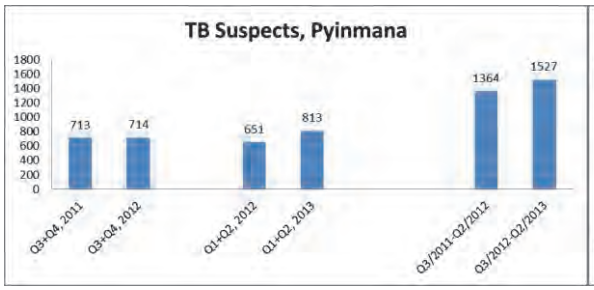
In Pyinmana Township, due to administrative structure change in the beginning of implementation, baseline is not available so it is not possible to see change after introduction. However there may be some increase. When compared the number in first one year of implementation and 3rd year, the number has increased by 4.3%.

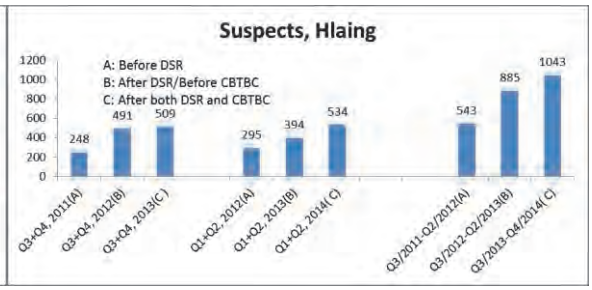


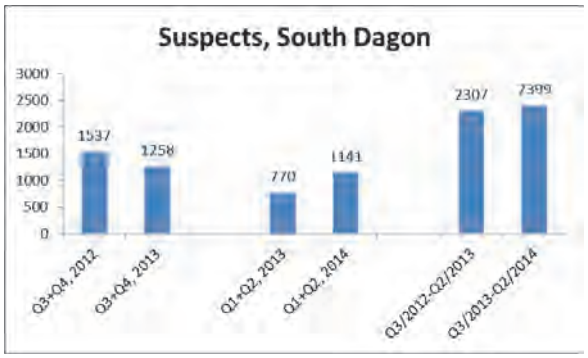


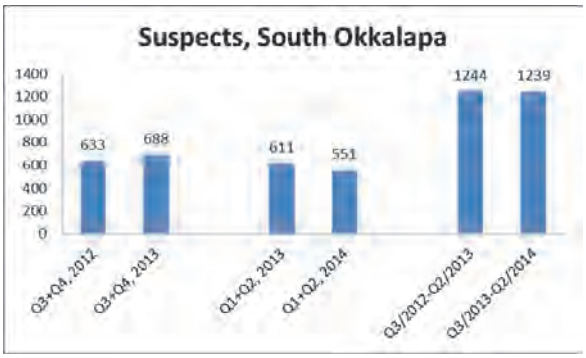
Indicator 4

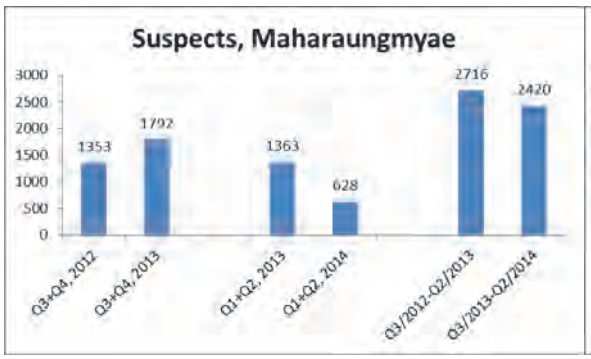
The number of TB suspects increased in 4 among 6 townships where DSR and/or CBTBC were implemented by support of the Project. There are seasonal variations in the number of suspects and when compared by each quarter, there are large differences of number of suspects. Some Townships showed marked reduction of the number in one quarter while marked increment in other quarter. If we compare number of suspects during the 6 month period (two quarters) before/after introduction of DSR and/or CBTBC, 5 out of 6 Townships shows 10% increase. Although there are various degrees of increment and only two Townships showed increment by over 10% if we compare the number of suspects during the 1 year period before/after introduction of DSR and/or CBTBC, provided that the trend has been upward in those Townships, this indicator are almost achieved.

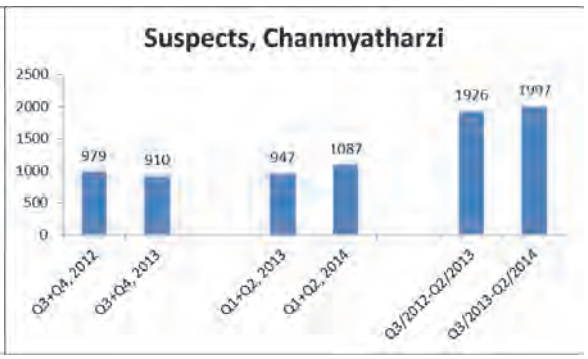












4.4 Overall Goal

Overall Goal	To halt and reverse the TB incidence by the year 2015,
Indicator 1	New smear positive TB detected is maintained.
Indicator 2	Case notification rate (all forms of TB) is increased up to 2015 and shows a downward trend.

As described before, in general, there are some difficulties to judge indicators regarding TB incidence. As for indicator 1 and 2, the number of new smear positive cases and case notification rate for all forms of TB have already showed downward trend in 2013 and in this regard the overall goal has already been achieved. However, it is necessary to observe for several years more to judge that the both indicators are in the down ward trend. Thus, at this moment it is difficult to evaluate the possibility of achievement of overall goals.

5. Implementation Process

The component has been working in close collaboration with NTP including Lower Myanmar TB Center and Upper Myanmar TB Center through regular meetings. In the field, NTP, the experts, TMO and township staff got together in quarterly planning meetings. In the process of developing the guidelines, face-to face discussion functioned well. In addition, the Project has succeeded in securing active participation of CHVs and drug sellers involved in TB patient referral.

6. JCC and Revision of PDM

1) JCC in December 2012

The target for some of indicators were revised as mentioned below.

2) JCC in September 2013

JCC was held on the occasion of the mid-term evaluation. PDM was revised as mentioned below. It concluded that the TB component of Project is on the way to attain its intended Project Purpose with expected contribution in realizing Overall Goal.

3) JCC in September 2014

JCC was held on the occasion of the terminal evaluation. It concluded that the Project Purpose is considered achieved although some indicators could not be evaluated exactly due to the current situation of TB incidence. The Project successfully contributed to the capacity development of NTP. Moreover, it should be noted that the Project has contributed the enhanced performance of TB control program in Myanmar.

The followings are recommended: i) the budget is allocated to hold the monitoring/evaluation meetings. Frequency and levels of these meetings may be considered together with the process of decentralization of health administration, ii) assessment of the necessary inputs such as human resources and activities of CBTBC and the DSR be done to extract the effective approaches to different socio-economic groups by comparing results of CBTBC and the DSR in different settings. iii) It is recommended to prepare the Myanmar version of the Guidelines on Drug Sellers' Referral for TB Control local users at township level. iv) It is recommended to continue 1) to produce Annual Report on EQA for TB microscopy, Myanmar regularly, 2) to hold national annual laboratory evaluation meeting with dissemination of EQA annual report finding and 3) to provide training for strengthening capacity building of laboratory staff including senior TB laboratory supervisors and TB microscopists.

7. Revision of PDM

1) The target for Indicators of Output 2 was revised by JCC in December 2012.

	The Original version	Revised version
Output 2	2.1 Three or four out of six laboratories at station hospitals without major error 2.3 Case detection in the target area is increased by 30% with the support of drug sellers 2.5 Case detection in the pilot area is increased by 5% with support of Community Based TB Care	2.1 Four out of five laboratories at station hospitals without major error 2.3 Case detection in the pilot area is increased by 10% with the support of drug sellers 2.5 Case detection in the pilot area is increased by 10% with support of Community Based TB Care

2) Major revision was made by JCC in September 2012. The indicators for the project purpose was revised to measure the Project Purpose appropriately considering its basic nature of a vehicle for pilot project and experimental activity implementation with key equipment provision and key trainings while the Indicators of the PDM measure part of the NTP's entire performance. An indicator of Output 1 is revised to represent the meaningful facts caused by the attainment of the Output 1. An indicator of Output 1 is also revised to incorporate meaning Indicators.

	Previous version (December 2012)	Revised version (September 2013)
Project Purpose	1.1 Case Detection Rate (CDR) > 70% and Treatment Success Rate (TSR) > 85% are achieved or sustained in Yangon and Mandalay Regions by year 2015 1.2 No. of new smear positive TB detected in target areas (8,329 in Yangon, 3,360 in Mandalay in 2010 to 8,880 in Yangon, 3582 in Mandalay in 2015) 1.3 No. of guideline which is approved by Ministry of Health in Myanmar	1. More than 70% in Case Detection Rate (CDR) and more than 85% in Treatment Success Rate (TSR) are achieved or sustained in implementing Townships by year 2015 2. Case detection in implementing Townships by Drug Seller Referral is increased by 3.2% 3. Case detection in implementing Townships by CBTBC is increased by 3.2% 4. TB suspect examination in implementing Townships in Yangon and Mandalay Regions is increased by 10%
Output 1	1.1 No. of abstracts on the operational researches approved and presented at the Union Conference 1.2 Achievement is presented with GIS tool at the Regional evaluation meetings by Regional TB officers 1.3 EQA annual report is published	1.1 10 townships utilizing developed guidelines of either CBTBC or drug sellers' referral to expand the related activities 1.2 90% of the laboratories with no major error on quarterly basis through utilizing EQA annual report in Yangon and Mandalay Regions

	1.4 The protocol for repeat nationwide TB prevalence survey is developed.	
Output 2	2.1 Four out of five laboratories at station hospitals without major error	2.1 90% of the laboratories with no major error on quarterly basis through utilizing EQA annual report in Station Hospitals.
	2.2 No. of referred TB suspects by the drug sellers	2.2 TB suspect examination by drug sellers in project areas is increased by 10%
	2.3 Case detection in the pilot area is increased by 10% with the support of drug sellers	2.3 TB suspect examination by community volunteers in project areas is increased by 5%
	2.4 No. of referred TB suspects by the trained community volunteers	2.4 Case detection by drug sellers in the project areas is increased by 5%
	2.5 Case detection in the pilot area is increased by 10% with support of Community Based TB Care	2.5 Case detection by community volunteers in the project areas is increased by 5%
	2.6 Community Based TB Care guideline is developed	

8. Lesson learnt and recommendation on areas to be strengthened further in NTP, Myanmar

Relevance of the project is considered high, primarily because the Project is consistent with needs of strengthening TB control identified by the findings from the national prevalence survey. Selections of project areas also are considered appropriate because Yangon and Mandalay Regions are the two most populated areas in Myanmar and consist of both urban and rural areas are suitable for the model development. It is also recognized that the project contributed to M&E and partnership development in the region through biannual evaluation meetings. It also served as opportunities of sharing experiences of NTP/JICA model areas.

The project has been working in close collaboration with NTP including Lower Myanmar TB Center, Upper Myanmar TB Center and NTRL through close communications such as regular meetings. In the field, NTP, the experts, TMO and other township staff got together in meetings such as quarterly review meetings. In the process of developing the guidelines, face-to face discussion functioned well. The project respects ownership of MOH for the activities supported by the project. It is regarded as uniqueness of JICA project different from implementing partners of NTP.

While TB control has been improved in Myanmar, it remains one of major health problems. Further efforts of strengthening are required. Considering the current situations and issues expected in future, it is recommended NTP address and carry out followings.

i) To carry out another prevalence survey to assess effects of interventions

Based on the findings, NPT made various efforts of strengthening CF. The next survey needs to be done to assess the impact and further issues to be addressed in NTP.

ii) To develop Urban TB Control Program

Mobile Team activities found many cases and defaulter rate tends to be high in the areas with mobile population in urban areas. Some special activities may be necessary for them.

iii) To accelerate early case finding

It has been shown that majority of prevalent bacteriologically positive cases have no typical symptom.

Appropriate approaches for accelerating early detection from the view of both feasibility and effectiveness need to be developed.

iv) To strengthen routine surveillance system

Epidemiological assessment to which JICA expert contributed indicates a need of strengthening notification/surveillance system. It includes development of electronic surveillance system and policy related to mandatory notification from all doctors.

v) Linkage with UHC

CHV in CBTBC contribute to not only TB but also other health programmes. TB control may be utilized for promoting UHC through collaboration with other health services.

Linkage with other clinical service is getting important. Because both population and TB patients are aging, proportion of TB patients with medical complication is expected to increase and diagnosis and treatment is more difficult than non-complicated cases, as shown in treatment outcomes.

vi) To utilize operational researches to address these issues

As experienced in the project, it is expected to contribute to identification of problems and solutions.

Japan can provide technical assistance to these areas with experiences in Japan.

Annex

Annex 1: List of Experts for the TB components

Name of Expert	Duration	Field	Period
Dr. Hiroyuki NISHIYAMA	Long	TB Control	22 Mar ~ 19 Jul 2012
			1 Sep ~ 9 Dec 2012
			29 Jan ~ 27 Jul 2013
			21 Aug ~ 15 Dec 2013
			2 ~ 19 Feb 2014
Dr. Norio YAMADA	Long	TB Control/ Epidemiology	5 May ~ 28 Jul 2014
			5 Sep ~ 13 Dec 2014
			5 Jan-28 Feb 2015
Dr. Akira SHIMOUCHI	Short	General Management	14 May ~ 1Jun 2012
Dr. Nobukatsu ISHIKAWA	Short	Community DOTS	10 ~ 18 Jun 2012
Dr. Akiko FUJIKI	Short	Quality Assurance for Laboratory	26 Jun ~ 7 Jul 2012
Dr. Akira SHIMOUCHI	Short	General Management	10 ~ 25 Sep 2012
Dr. Yutaka HOSHINO	Short	Radiophotography	30 Sep ~ Oct 6 2012
Dr. Nobukatsu ISHIKAWA	Short	Community DOTS	14 ~ 22 Oct 2012
Dr. Norio YAMADA	Short	Epidemiological Statistics	22 Oct ~ 4 Nov 2012
Dr. Akira SHIMOUCHI	Short	General Management	20 Nov ~ 9 Dec 2012
Dr. Nobukatsu ISHIKAWA	Short	Community DOTS	14 ~22 Feb 2013
Dr. Akira SHIMOUCHI	Short	General Management	17 Feb ~ 2 Mar 2013
Dr. Akiko FUJIKI	Short	Quality Assurance for Laboratory	18 Mar ~ Apr14 2013
Dr. Akiko FUJIKI	Short	Quality Assurance for Laboratory	6 Jun ~ 10 Jul 2013
Dr. Kosuke OKADA	Short	General Management	7 ~ 27 Jul 2013
Dr. Nobukatsu ISHIKAWA	Short	Community DOTS	13 ~21 July 2013
Dr. Norio YAMADA	Short	TB Control/ Epidemiology	5 ~ 18 Aug 2013
Ms. Akiko FUJIKI	Short	Quality Assurance for Laboratory	10 Sep ~ 31 Oct 2013
Dr. Kosuke OKADA	Short	General Management	12 Sep ~ 2 Oct 2013
Dr. Nobukatsu ISHIKAWA	Short	Community DOTS	10 ~ 18 Nov 2013
Dr. Yutaka HOSHINO	Short	CXR Radio Technologist	23 ~ 29 Nov 2013
Dr. Norio YAMADA	Short	Epidemiology	5 Jan ~ 15 Feb 2014
Ms. Akiko FUJIKI	Short	Quality Assurance for Laboratory	23 Jan ~ 28 Feb 2014
Dr. Kosuke OKADA	Short	General Management	5 Feb ~ 4 Mar 2014
Dr. Nobukatsu ISHIKAWA	Short	Community DOTS	14 Feb ~ 22 Feb 2014
Dr. Kosuke OKADA	Short	General Management	14 ~ 3 June 2014
Ms. Akiko FUJIKI	Short	Quality Assurance for Laboratory	20 May ~ 22 Jun 2014
Dr. Kosuke OKADA	Short	General Management	3 ~ 23 Aug 2014
Ms. Akiko FUJIKI	Short	Quality Assurance for	17 Sep ~ 3 Nov 2014

		Laboratory	
Dr. Kosuke OKADA	Short	Community DOTS (*Replaced temporarily from Dr ISHIKAWA)	27 Sep ~ 4 Oct 2014
Dr. Susumu HIRAO	Short	CXR Reading	7 ~ 16 Oct, 2014
Ms. Akiko FUJIKI	Short	Quality Assurance for Laboratory	12 ~ 31 Jan 2015
Dr. Kosuke OKADA	Short	General Management	1 ~ 14 Feb *2015*
Dr. Nobukatsu ISHIKAWA	Short	Community DOTS	2 ~ 11 Oct 2014

Annex 2: Counterpart Training of TB Components of MIDCP

Name of MOH Counterpart	**Country Visited**	**Travel Period**	**Main Title of Training/Conference**
Dr. Ohnmar Myint	Kuala Lumpur, Malaysia	13 ~ 17 Nov 2012	43th Union World Conference on Lung Health
Dr. Khin Zaw Latt	Hanoi, Vietnam	10 ~ 13 Apr 2013	4th Asia Pacific Region Conference of International Union against TB & Lung Disease
Dr. Tin Tin Mar			
Dr. Sithu Aung	Paris, France	30 Oct ~ 3 Nov 2013	44th Union World Conference on Lung Disease
Dr. Htay Htay Hlaing			
Dr. Tin Tin Mar	Barcelona, Spain	28 Oct ~ 11 Nov 2014	45th Union World Conference on Lung Disease
Dr.Toe Sandar			

Annex 3-1: Provision of Equipment and Materials

Year				Grand Total	128,071 USD
FY2012	NTP	*Name of Equipment*	*Quantity*	*Actual Cost in JPY*	
		Computed Radiography	2	6,214,240	
			FY2012 Total	6,214,240	75,528 USD
FY2013	NTP	*Name of Equipment*	*Quantity*	*Actual Cost in JPY*	
		Binocular Microscope (Olympus)	10	1,485,656	
		Fluorescent Microscope (Carl Zeiss Primostar FI iLED)	2	429,240	
		X-ray Films (Dry Film DI-HL 35x43 100shts)	21	535,581	
		X-ray Films (Dry Film DI-HL 20x25 150shts)	4		
		Copier (Canon IR 2520)	1	140,525	
		Color Printer (Canon LBP 7750 CDN Printer)	1	795,996	
		Laptop Computer (Dell Vostro V5560 Notebook)	1		
		Desktop Computer (Dell Inspiron 660MT Desktop)	1		
		Laptop Computer (Lenovo Ideapad G400 Notebook)	11		
		Mono (Black & White) Printer (Canon LBP 6000)	11		
		Electric Generator Set	11	552,084	
		Battery and Mini-Inverter Set	4		
			FY2013 Total	3,939,082	39,544 USD
FY2014	NTP	*Name of Equipment*	*Quantity*	*Quoted Unit Price*	*Estimate in USD($)*
		Fluorescent microscope with additional external battery unit	5	2,600	13,000
			FY2014 Total	(Estimate)	13,000 USD

Annex 3-2: Operational Expenses

	FY 2012	FY 2013	FY 2014 (till July 2014)	Total
Tuberculosis	USD 125,033	USD 117,722	USD 23,606	USD 266,361

Project Design Matrix (PDM), JICA Major Infectious Diseases Control Project Phase 2, Myanmar (Version 3)

Date: 27th September 2013

TB
Duration: 19 January 2012 – 18 January 2015

Target Group: Residents in Yangon & Mandalay Regions
Target Area: Yangon and Mandalay Regions

NARATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Overall GOAL 1. To halt and reverse Tuberculosis (TB) incidence	1.1 New smear positive TB detected is maintained 1.2 Case notification rate (all forms of TB) is increased up to 2015 and shows a downward trend afterwards	1.1 National Tuberculosis Program (NTP) annual report	
PROJECT PURPOSE TB Control in Yangon and Mandalay Regions improved	1. More than 70% in Case Detection Rate (CDR) and more than 85% in Treatment Success Rate (TSR) are achieved or sustained in implementing townships by year 2015 2. Case detection in implementing townships by drug sellers referral is increased by 5% 3. Case detection in implementing townships by CBTBC is increased by 5% 4. TB suspect examination in implementing townships in Yangon and Mandalay Regions is increased by 10%	1. NTP annual report 2. Township data	Political commitment for TB control maintained TB control by Myanmar side and by other development partners progresses
OUTPUTS 1. Capacity for program management and data management for TB controls is strengthened	1.1 10 townships utilizing developed guidelines of either CBTBC or drug sellers' referral to expand the related activities 1.2 90% of the laboratories with no major error on quarterly basis through utilizing EQA annual report in Yangon and Mandalay Regions	1.1 OR reports 1.2 NTP publication	Drug supply maintained Vacant laboratory technicians' posts do not increase
2. Capacity for TB control is strengthened in Yangon and Mandalay Regions in accordance with Stop TB Strategy	2.1 90% of the laboratories with no major error on quarterly basis through utilizing EQA annual report in station hospitals. 2.2 TB suspect examination by drug sellers in project areas is increased by 10% 2.3 TB suspect examination by community volunteers in project areas is increased by 5% 2.4 Case detection by drug sellers in the project areas is increased by 5% 2.5 Case detection by community volunteers in the project areas is increased by 5%	2.1 Project record 2.2 NTP publication 2.3 Project record	HIV prevalence remains stable

Activities	Inputs	
To improve the Programme Management <Guideline Development and Utilization> 1.1 Carry out operational researches on CBTBC and Drug Seller referral based on piloting activities including social mobilization and training 1.2 Develop CBTBC and Drug Seller referral guidelines and share guidelines, experiences and results with other development partners 1.3 Utilize guidelines for expansion of standardized activities by other fund 1.4 Monitor the standardized activities <Data Management and Utilization> 1.5 Train on data and information management such as GIS Training 1.6 Improve EQA data management at National TB Reference Laboratory 1.7 Present OR results at the international conferences 1.8 Develop draft protocol on Second Nationwide TB Prevalence Survey scheduled in 2017 <Model of Improvement in Sputum Smear Microscopy Performance at Station Hospitals> 2.1 Conduct supervision to station hospitals' sputum smear microscopy 2.2 Review model of sputum smear microscopy diagnosis at station hospitals and share experiences with other partners 2.3 Organize mobile team activities in high risk group, hard-to-reach areas, urban and peri-urban areas <Expansion of Model Activities of CBTBC and Drug Seller referral> 2.4 Introduction and expansion of the activity of CBTBC and Drug Seller referral <Training> 2.5 Conduct training related to the activities in line with Stop TB Strategy eg. TB/HIV, chest X-ray, counselling	(By Japan) 1. Experts: 1) Chief Advisor 2) Project Coordinator 3) TB control and prevention 4) Quality Assurance for smear sputum microscopy 5) Community Based TB Care 6) Epidemiology 2. Supply and equipment: 3. Training/ Conference 4. Operational cost 5. Other necessary cost (By Myanmar) 1. Project office facilities 2. NTP officers 3. Necessary supply	A lot of counter parts do not resign

etc. **To improve the Programme Management in Yangon and Mandalay Regions** <Coordination/ Collaboration with Entities Conducting TB Control Activities> 2.6 Organize TB meetings for Monitoring & Evaluation of township (Regional TB Evaluation Meeting) and for coordination/ collaboration with partners 2.7 Carry out quarterly TB meetings at township level for further improvement of case finding and case holding		*Pre-Conditions* Allocation of necessary human resources by Counterpart institution for the Project is secured National Tuberculosis control strategy is not changed International environment for supporting TB control is not changed

* abbreviation

- TB: Tuberculosis
- CBTBC: community based TB care
- NTP: National Tuberculosis Program
- DOTS: Directly Observed Treatment Short Course Chemotherapy
- GIS: Geographical Information System

Plan of Operation(PDM ver.3)

Expert	2013-1	2013-2	2013-3	2013-4	2013-5	2013-6	2013-7	2013-8	2013-9	2013-10	2013-11	2013-12	2014-1	2014-2	2014-3	2014-4	2014-5	2014-6	2014-7	2014-8	2014-9	2014-10	2014-11	2014-12	2015-1	2015-2	2015-3	備考
TB Control I		12	2		21				19	2				24	4		21			21						14		
TB Control II	3	28	9	12	25	21	27	11	30	19	30	15		18			21	16	28		26	31	30	13	27	18		
Community DOTS		9					9				9			9								8				10		
Epidemiology								14					27	15														
EQA Expert			14	14		25	10		21	31			9	28				10	24		15	30	3		20			
Radiology Expert											7								7									
Radiology Expert																						10						

TB Control I	TB Control II	Community DOTS	Epidemiology	EQA Expert	Radiology Expert	Radiology Expert	Activities	
							Output 1. Capacity for Program management and data management for TB Control in strengthened	
							Guideline Development and Utilization	
●	●	●	●				1.1 Carry out operational researches on CBTBC and Drug Seller referral based on piloting activities including social mobilization	plan
●	●	●	●					actual
	●						1.2 Develop CBTBC and Drug Seller referral guidelines and share guidelines, experiences and results with other development partners	plan
	●							actual
	●			●			1.3 Utilize guidelines for expansion of standardized activities by other fund	plan
	●			●				actual
●	●						1.4 Monitor the standadized activities	plan
●	●							actual
							Data Management and Utilization	
	●						1.5 Train on data and information management such as GIS training	plan
	●							actual
	●						1.6 Improve EQA data management at National TB Referance Laboratory	plan
	●			●				actual
	●						1.7 Present OR results at the international conferences	plan
	●							actual
	●						1.8 Develop draft protcol on Second Nationwide TB Prevalence Survey scheduled in 2017	plan
	●							actual
							Training	
	●				●		1.9 Conduct training related to the activities in line with Stop TB Strategy eg. TB/HIV, chest X-ray, counselling etc.	plan
	●				●			actual
							Output 2. Capacity for TB control is strengthened in Yangon and Mandalay Regions in accordance with Stop TB Strategy	
							Model of Improvement in Sputum Smear Microsopy Performane at Station Hospital	
	●			●			2.1 Conduct supervision to station hospitals' sputum smear microscopy	plan
	●			●				actual
	●			●			2.2 Review model of sputum smearmicroscopy diagnosis at station hospitals and share experiences with other partners	plan
	●			●				actual
●	●						2.3 Organize mobile team activities in high risk group, hard-to - reach areas, urban and peri-urban areas	plan
●	●							actual
							Expansion of Model Acitivities of CBTBC and Drug Seller	
●	●						2.4 Introduction and expansion of the activity of CBTBC and Drug Seller Referral	plan
●	●							actual
							Coordination/Collaboraiont with Entities Conductiong TB Control Activities	
●	●					●	2.5 Organize TB meetings for Monitoring & Evaluation of township (Regional TB Evaluation Meeting) and for coordination/ collaboration with partners	plan
●	●					●		actual
●	●						2.6 Carry out quarterly TB meetings at township level for further improvement of case finding and case holding	plan
●	●							actual