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PMDT MONITORING REPORT

Programme: Country
Bangladesh

Lead implementing agency
National TB Control Programme, Government of Bangladesh

Inclusive dates of mission: 23 – 27 November 2014

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Terms of Reference (TOR) of the mission

- To assess present status, case finding, treatment strategies, administration and follow-up and evaluate the current achievement in managing DR−TB;
- To collect and analyze data on DR−TB patients on treatment;
- To assess situation with procurement and supply management of SLDs including ancillary drugs and other logistics by using QUAN TB in collaboration with MSH;
- To provide guidance on MIS specially on electronic data management for DR−TB programme;
- To assess laboratory services for DR−TB management including rapid diagnostic tools and infection control;
- To review draft protocol for shorter regimen (SR) and provide guidance and analyze the strengths and current feasibility of country wide expansion of SR;
- To provide guidance/recommendations for implementation of PMDT activities for next one year.

Summary of the mission activities
This is the sixth rGLC monitoring mission of the programmatic management of drug–resistant tuberculosis (PMDT) component of the NTP of the Government of Bangladesh. A detailed review of PMDT care and services was however conducted during the 2014 Joint Monitoring Mission (JMM) of NTP in March−April 2014. Hence, despite the above set of TOR, the author decided to concentrate on the outcome of the recent GF NFM Concept Note application, the transition from TBCARE2 to Challenge TB in 2015, and the implications of these in regard to the planned expansion of PMDT, during this short rGLC mission. Hence field visits were limited in number and duration, with more time spent in discussion with NTP Central Office staff and staff of partner organizations based in Dhaka.

Abbreviations

ADR	Adverse drug reactions
BRAC	Bangladesh Rural Advancement Committee
CDC	Chest Disease Clinic
CDH	Chest Disease Hospital
C/DST	Culture and Drug Susceptibility Testing
cPMDT	Community based approach to PMDT
Cs	Cycloserine
DF	Damien Foundation
DOT	Directly Observed Treatment
DP	DOT provider
DRS	Drug Resistance Survey
DST	Drug Susceptibility Testing
DR–TB	Drug–resistant tuberculosis
Eto	Ethionamide
FLDs	First line anti-TB Drugs
FQ	Fluoroquinolones
GDF	Global TB Drug Facility
GF	Global Fund to Fight AIDS, Tuberculosis and Malaria
GLC	Green Light Committee
GOB	Government of Bangladesh
JMM	Joint Monitoring Mission
KNCV	KNCV Tuberculosis Foundation, The Netherlands
LED	Light emitting diode microscope
Lfx	Levofloxacin
LMIS	Laboratory management information system
LPA	Line Probe Assay
MoH&FW	Ministry of Health and family Welfare
MDR-TB	Multidrug−resistant tuberculosis
MSH/SIAPS	Management Sciences for Health/Systems for Improved Access to Pharmaceuticals and Services
NGO	Non–government Organization
NIDCH	National Institute of Diseases of Chest and Hospital
NFM	New Funding Model
NTRL	National TB Reference Laboratory
NTP	National TB control Programme
OR	Operational research
PMDT	Programmatic Management of Drug Resistant Tuberculosis
PPM	Public–Private Mix
PR	Principal Recipient
PSM	Procurement and supplies management
PV	Pharmacovigilance
PTB	Pulmonary TB
QA	Quality assurance
rGLC	Regional Green Light Committee
RR	Rifampicin resistance
RTRL	Regional TB Reference Laboratory
SL	Second line
SLDs	Second line anti-TB drugs
SR	Sub-Recipient
SR9	9 month shorter MDR–TB treatment regimen
TB	Tuberculosis
URC	University Research Co
USAID	United States Agency for International Development
WHO	World Health Organization
XDR-TB	Extensively drug–resistant tuberculosis

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I. Executive summary

This is the 6th monitoring mission of the Programmatic Management of Drug–resistant Tuberculosis (PMDT) component of the NTP of the Government of Bangladesh (GOB) undertaken on behalf of the Regional Green Light Committee (rGLC) of the World Health Organization's (WHO) South East Asia Region. Tuberculosis (TB) is a major public health problem in Bangladesh and its control remains a priority for the GOB. The NTP adopted the "Directly Observed Treatment Short Course" strategy and started its field implementation in late 1993. The programme progressively expanded to cover all upazilas by mid-1998. By 2007, services were available throughout the country, including the metropolitan cities.

Overall the NTP, MoH&FW is performing well with a total of 190,891 cases notified in 2013, with a treatment success rate of 92% amongst new and relapse sputum smear positive pulmonary TB cases. A National Tuberculosis Reference Laboratory (NTRL) has been established in National Institute of Diseases of Chest and Hospital (NIDCH) in Dhaka. In August 2008, the NTP started enrolment of multidrug–resistant TB (MDR–TB) patients utilising a Green Light Committee (GLC) approved 24 month regimen in NIDCH with the support of GF. In addition, the Damien Foundation (DF) has been providing MDR–TB treatment since 2005 in those districts which it supports, utilising a 9 months treatment regimen (known as the "Bangladesh shorter MDR TB regimen"). As per the PMDT expansion plan, NTP has now established Regional TB Reference Laboratories (RTRL) in Chittagong and Rajshahi. The Damien Foundation has its own reference laboratory in Netrakona.

Much progress has been made since the review of the PMDT services conducted during the 2014 Joint Monitoring Mission (JMM). Many of the recommendations from the 2013 rGLC visit and the 2014 JMM have been followed. However many remain yet to be met. A National Strategic Plan for TB Control 2015 to 2020, has been developed, and a Concept Note was submitted to the Global Fund's (GF) New Funding Model (NFM) under the June 2014 "Window". Diagnostic capacity is expanding with an increased number of light emitting diode (LED) microscopes in place (200 added in 2014), the number of culture and drug susceptibility testing (C/DST) laboratories will increase in the near future from 3 to possibly 5 (the laboratories in in Khulna and Sylhet are currently under preparation), and an increased number of Xpert® MTB/RIF machines (now 39) are in place as the primary and initial MDR-TB diagnostic test. An increasing number of patients are being detected and enrolled on treatment (684 in 2013, 719 up to October 2014). Outcomes for patients treated with either the 24 month or the shorter 9 month regimen, remain good at over 70% in the 2012 patient cohorts. The community based PMDT (cPMDT) activities have now been expanded to whole county in 2014. And the social support package for patients and incentives for DOT Providers are more widely implemented. Pilotting of mHealth monitoring of care by the DOT Providers has been introduced in 34 districts. And enhancements and strengthening of the electronic information (eTB Manager) and forecasting systems (Quan TB) are ongoing.

As of October 2014, a cumulative total of 3,473 MDR–TB patients have been enrolled on second line drug treatment. A total of 2,140 patients have been enroled for management with the GLC approved regimen (now at 5 treatment sites in NIDCH Dhaka, Chittagong Chest Disease Hospital [CDH], CDH Pabna, CDH Khulna and CDH Sylhet). The annual treatment success rates of patients enrolled from 2008 to 2012 (January to June only) have ranged from 64% to 72%, increasing over time with the latest cohort having a 72% success rate. From May 2005 to October 2014, a total of 1,333 MDR−TB patients have been enroled for management with the shorter 9 month regimen (SR9). The annual treatment success rates of those patients enroled on the SR9 from 2008 to 2012 have ranged from 74% to 82%, with the latest cohort having a 79% success rate.

The community based approach to PMDT has now been expanded to cover whole country in 2014. Under the cPMDT the period of hospitalization is reduced from 8 months to 1-2 months. This will allow for an easier implementation of the GOB's plan to establish government hospitals for initial hospitalization of MDR−TB patients across the country in all 7 divisions. Currently there are 5 treatment sites under NTP where the 24 month regimen is used along with cPMDT, with a bed complement of around 300 beds. There are an additional 60 beds in DF facilities.

The country has developed a PMDT Expansion Plan for 2013-17 under which each district and city corporation will have at least one Xpert machine (with a total of 80 machines planned to be in place by 2017) and progressively over the period 2013 to 2017, a total of 9,250 MDR TB cases are proposed to be put on treatment. When published in November 2013, the 2,650 cases that were planned to be enroled on treatment in 2017 itself equated to 70% of the estimated MDR−TB cases existing amongst the notified pulmonary TB (PTB) cases that would be put on treatment by NTP in 2017. Also NTP planned to expand the use of the shorter 9 month regimen under PMDT in a

phased manner so that the percentage of patients receiving the shorter regimen would increase from 15% in 2013 to 89% by the year 2017.

However to realize the somewhat ambitious targets of the current PMDT Expansion Plan, adequate and sustainable financing for the expansion plan is required, with an increasing commitment from GOB and continued technical assistance from partners and WHO. However a significantly lower amount of funding has been approved under the GF NFM than had been requested by GoB and partners. There is budget under the NFM funds allocated for the procurement of 25 Xpert MTB/RIF machines (Year 1:10, Year 2:10, and Year 3: 5) with yearly calibration costs, but there no budget for the procurement of cartridges. There are funds budgeted for only 1,900 M/XDR−TB (Year 1:755, Year 2: 770, and Year 3:375) patient drug courses and linked social support packages in the 30 month NFM grant period (July 2015 to December 2017). TBCARE2 activities are ending in June 2015, with a transition to Challenge TB. The lead partner in country under TBCARE2 (URC) is changing under Challenge TB (MSH).

It is crucial that all available funding for PMDT scale up for the next 2 to 3 years from all sources is clearly delineated, with a detailed breakdown by activity (e.g. diagnostic and drug commodity procurement, social support packages, sputum collection and transportation mechanisms, etc) and by partner. Subsequently, the current 2013 to 2017 PMDT Expansion Plan needs to be urgently reviewed and updated if needed. A smooth transition from TBCARE2 to Challenge TB needs to be ensured, and the key current TBCARE2 PMDT−related activities maintained under the Challenge TB workplan and budgets. The current national laboratory strengthening plan needs to be updated, to ensure alignment of any increased laboratory capacity with management capacity for MDR−TB patients, with strict quality assurance (QA) of smear microscopy services in place. The GOB needs to gradually increase its financial support to NTP. The engagement with donors and partners for garnering the required financing, needs to be actively pursued in view of the NTP's vision for Universal Access for diagnosis and treatment for all TB patients, including patients with drug–resistant TB (DR–TB).

Additional challenges and recommendations are detailed in the main text of the report.

1. Findings/Observations

a) Progress from the 2014 JMM of NTP and the 2013 rGLC mission

The progress in implementation against the priority PMDT–related recommendations from the 2014 JMM of NTP held in March/April 2014 is as below:

Recommendations	Progress
1. NTP to routinely monitor the results from the ongoing continuous DR surveillance conducted by the International Centre for Diarrhoeal Disease Research, Bangladesh and DF.	Not met
2. An analysis of the impact of DR−TB case finding activities on the notifications and treatment outcomes of previously treated cases to be undertaken.	Not met
3. Ensure adequate history taking of previous TB treatment and subsequent correct classification of patients is done by health care providers.	On–going
4. Make available the latest DR-TB Guidelines and latest forms at all sites as needed.	Met
5. Ensure 100% identification and DST by GeneXpert of all retreatment cases and other MDR− TB risk groups (i.e. the nine defined MDR-TB risk groups) by the end of 2015.	On–going, but little progress
6. Strengthen sputum collection and sample transportation networks to the Upazila level and those sites with the GeneGeneXpert machines.	On–going
7. Design and implement a GeneXpert MTB/RIF Test Register at each DOT Centre. This register should have the patient's name, address, phone number, date specimen was sent for GeneXpert, indication (including MDR-TB indications, smear negative highly suspected TB, and extra pulmonary TB), result, date the result is entered in the register, and action taken (e.g. put on treatment or not, put on first-line or MDR-TB treatment etc.).	Met
8. Introduce a DR-TB Registry in all districts – this will serve as a "waiting list" of patients for treatment and will enable the tracking of all diagnosed DR-TB patients.	Met

9. Strengthen the network of RTRLs, and in particular for the required decentralized capacity for culture follow up examinations of MDR-TB patients on treatment.	On–going
10. Ensure quick turnaround time of C/DST results to the referring or treatment units.	Moving to Xpert as initial test
11. Strengthen the in−country capacity to perform SL DST. Consider the use of line probe assay (LPA) second line (SL) drug susceptibility testing (DST) as "rule in" test for resistance to fluoroquinolones (FQ) and SL injectables.	Not met, LPA SL DST not available in the country
12. Introduce a comprehensive, integrated electronic information system which links NTRLs, RTRLs, treatment centres, drug storage units and NTP at the earliest. Explore whether eTB Manager system could be adapted to undertake this function.	On–going
13. Ensure prompt treatment initiation for all diagnosed RR-TB patients by GeneXpert. As per recent WHO policy, there is no need of further testing for rifampicin resistance (RR) in those with MDR−TB risks. If unexpected RR detected in a new case, repeat the GeneXpert test and treat according to result of this second GeneXpert test. Review the diagnostic algorithms in relation to MDR−TB suspects and amend accordingly.	Met for re–treatment cases. In new cases, confirmation by C/DST done.
14. Linkages between CDH and Upazila level to be strengthened.	On–going
15. Introduce an initial MDR−TB patient enrolment form and monthly follow-up form.	Enrolment form introduced, not done for the monthly follow–up form
16. Explore, and implement accordingly, standardized hospitalization and social support policies for MDR−TB patients and incentive package for MDR−TB DOT Providers across all sites in the country.	Being rolled out under GF PR 2.
17. Urgently review existing drug stocks for MDR-TB and extensively drug–resistant TB (XDR-TB) treatment against current patients on treatment and planned future enrolment, and make changes to the monitoring systems and ongoing procurement as needed.	Met
18. Ensure an adequate supply of drugs etc. for adverse drug reactions (ADR) treatment, and sufficient trained staff to undertake the ADR management. Adopt a strategy of "zero hearing loss" from MDR-TB treatment. Strengthen the pharmacovigilance (PV) systems across all sites, irrespective of drug regimen used for the treatment of M/XDR-TB patients.	Partially met for ancillary drugs. PV systems not met.
19. Evaluate the current one day MDR−TB directly observed treatment (DOT) Provider training, and consider either lengthening the training or adding frequent refresher trainings.	Not met as funds not available
20. Ensure good infection control measures are in place, especially at the indoor facilities for M/XDR-TB.	On–going
21. Consider including respiratory function testing in the post treatment follow up schedule.	Not met
22. To facilitate the planned transition from the WHO recommended 20 months regimen to a shorter (9 to 12 months) regimen over the coming years, and utilizing GF support: • Results of cPMDT evaluation need to be made available and reviewed as soon as possible. Outcomes and complete costing of the different care models for MDR−TB patients to be reviewed in order to inform future policy decisions; • Develop as a priority an operational research plan and implementation plan for the expansion of the shorter MDR−TB regimen in order to meet the criteria of involved donor and technical agencies; • Establish the required Scientific Committee / Drug Monitoring and Safety Board. Plan for an early review of the safety data in order to potentially amend the exclusion criteria and patient monitoring schedules accordingly to permit further scale up of the shorter regimen; • Submit the operational research plan to WHO Geneva for inputs as soon as possible, prior to its submission to the National Ethical	Partially met

Board for approval; and • Include the activities and budgetary requirements linked to the transition into the soon to be updated TB National Strategic Plan and in the Concept Note for future submission to the GF.	
23. NTP to urgently investigate the legal regulations regarding the importation and use of bedaquiline and delamanid in the country. NTP to aggressively pursue obtaining permission for importation and use of these drugs (under WHO indications) at the earliest.	Not met

The progress in implementation against the 10 priority recommendations of the 5th rGLC mission held in November 2013 is as below:

Recommendations	**Responsible Agency / Person**	**Progress**
1. Gradually move towards more financial support to NTP from GOB. Continue to engage with donors and partners for a sustainable financing in view of vision of NTP for Universal Access for diagnosis and treatment for all TB patients, including patients with DR–TB.	Ministry of Health & Family Welfare (MoH&FW)/ NTP	On–going
2. Leveraging human resources from GOB and partners and develop a costed human resource development plan to meet the target of rolling out cPMDT in all districts by 2015.	NTP (Partners to support)	Partially met
3. Develop a plan for aligning diagnostic capacity and scale up of diagnostic capacity with treatment capacity (drugs, adherence support, follow up laboratory capacity), human resource provisioning and development along with simultaneously transitioning to cPMDT and shorter DF regimen in consultation with stakeholders.	NTP (Partners to support)	On–going, updating of 2013 PMDT Plan needed
4. Monitor progress towards cPMDT expansion and roll out of shorter regimen against the plan so developed at recommendation 3. above and resolve any bottlenecks/issues on a quarterly basis.	NTP	On–going
5. Scale up decentralized laboratory capacity for follow up cultures of patients put on treatment.	NTP	On−going
6. Implement patient safety programme for identification and management of adverse effects of drugs by DOT provider and establish linkages with Chest Disease Clinic (CDC)/CDH for serious effects. Scale up to entire country along with scale up of cPMDT.	NTP (Partners to support)	Not met
7. Review and revise recording and reporting formats of PMDT. These formats must also capture process and efficiency of those processes at various levels (identification of suspect, collection and transportation of specimen, turnaround times for test and reports at NTRL/RTRL, Wards/Community etc. These benchmarks times/ processes should be used for monitoring/review.	NTP and Technical Partners	Met
8. Constitute an expert group to advise the programme for Operational Research on use of shorter regimen for approval of GOB and WHO, and subsequent roll out and monitoring under the programme.	NTP and WHO	Existing PMDT committee is working as the expert group for the SR OR
9. Transition to an electronic real–time Management Information System for PMDT.	NTP and MSH	On–going
10. Secure Technical Assistance (i.e. Consultants) from WHO and other technical partners for transitioning to shorter regimens and scale up of cPMDT.	NTP and WHO	Met

Therefore although many of the above recommendations have been met, a number from both the November 2013 rGLC mission and the 2014 JMM are still pending.

b) Key challenges identified during this mission

- Significantly lower amount of funding approved under the GF NFM than anticipated (USD $66.6m approved against request of USD $106.9m). There is allocated budget under the NFM funds for the procurement of 25 Xpert MTB/RIF machines (Year 1: 10, Year 2: 10, and Year 3: 5) with yearly calibration cost, but there is no budget for the procurement of additional cartridges to the current complement already in the country. Funds are budgeted for a total of 1,900 (Year 1 755; Year 2 770; and Year 3 [6 months only] 375) MDR–TB patient drug courses (under Principal Recipient [PR] 1) and linked social support packages (under PR 2).
- TBCARE2 activities are ending in June 2015, with a transition to Challenge TB. Lead partner in country under TBCARE2 (URC) is changing under Challenge TB (MSH)
- Proportion of retreatment cases out of the total smear positive PTB cases being registered under NTP, appears to remain low
- Yet it appears that less than 50% of the retreatment cases are provided with a DST. Limited access to Xpert testing from the peripheral levels reported in some areas due to the lack of sputum sample transportation systems.
- The available Xpert MTB/Rif capacity generally remains underutilized.
- Although harmonisation is occurring of the 2 quite distinct models of care for MDR−TB patients currently being implemented in parallel in different areas of the country, more is still needed.
- The protocol for the expansion of the shorter regimen (SR9) under operational research (OR) conditions is still not finalised.
- The availability of the laboratory tests for monitoring biochemistry, etc, is very variable and generally limited in the public sector, with private laboratories often being used with consequent cost to the patients for the performing of such tests.
- The eTB Manager system remains not fully functional, particularly in regard to the MDR−TB and laboratory management information system (LMIS) components.
- QuanTB is not being fully utilised.
- There is a lack of full time dedicated staff in the NTP Central Office for procurement and supplies management (PSM) and PMDT.

c) Current status of the country's implementation of PMDT

Bangladesh, with an estimated population of 157 million, is administratively divided into 7 divisions, 64 districts, 490 upazilas, 4,451 unions and over 68 000 villages. There are also 7 metropolitan cities and 119 municipalities in the country. The Ministry of Health and Family Welfare's health system is structured into 5 layers: 3 at the primary, 1 at the secondary and 1 at the tertiary levels. The NTP falls under the remit of the Directorate of Mycobacterial Disease Control, which functions under the Directorate of General Health Services of the MoH&FW. Service delivery for TB control in Bangladesh follows a quite unique public–private mix (PPM) model, with approximately 50 international and national non–governmental organizations (NGO) partnering with the NTP to provide services and care for TB patients.

The 1st Bangladesh National TB Drug Resistance Survey (DRS) conducted during 2010–2011 estimated that the proportion of new smear positive pulmonary TB cases with MDR–TB was 1.4% and 28.5% amongst the previously treated cases. In 2013, it was estimated that there were around 4,700 MDR–TB cases existing amongst the notified cases, with 2,100 amongst the new cases and 2,600 in the previously treated cases.

Hence although the country has developed a PMDT Expansion Plan for 2013-17, under the current plan, even if all actions proceed as per the plan, the planned 2,650 cases to be enroled on treatment in 2017 only equates to 56% of the estimated number of MDR–TB cases that exist amongst the notified cases. And in 2013, overall TB case detection was estimated by WHO to be only 53%. Hence the current plan appears to fall well short of achieving the agreed universal access targets by 2017, never mind for 2015 as per the World Health Assembly resolution as endorsed by the GOB.

Under the plan, the enrolment targets for 2013 and 2014 respectively were 1,000 and 1,400 cases. However in 2013, only 684 patients were enroled on to treatment. And as of October 2014, only 719 cases have been enroled on treatment in 2014. Thus the enrolment targets, low as they are, look like they will be not achieved in both 2013 and 2014. This may be partly explained by the fact that the expansion of the laboratory capacity has not materialised as had been planned. Hence instead of 6 C/DST laboratories and 50 Xpert machines, currently there are 3 C/DST laboratories and 39 Xpert machines in place. It was reported that in some areas, there was limited access to Xpert testing from the peripheral levels due to the lack of efficient sample transportation systems.

Although treatment success rates are good at over 70%, whether the 24 month or shorter 9 month regimen is used, this is still only reporting on relatively small cohorts of patients. And also although the community based approach to PMDT has now been expanded to cover 35 districts, not all 64 districts are fully and uniformly implementing cPMDT activities yet. Furthermore, the planned expansion of the use of the shorter 9 month regimen has not started. It is anticipated that by using the shorter regimen and the cPMDT approach to manage a larger number of MDR–TB patients, the strengths of these 2 aspects of care will work synergistically, and lead to even higher treatment success rates in Bangladesh.

Many technical challenges however remain to be overcome, and the details in relation to these areas are given in the following pages of the report. However the major obstacle to any rapid scale up of PMDT in Bangladesh in the coming years, is the lower levels of external funding being made available to NTP than anticipated (as laid out in brief in 1st bullet point above under **b) Key challenges identified in this mission**). In addition, there needs to be a smooth transition from TBCARE2 to Challenge TB to ensure that key PMDT activities currently provided under TBCARE2 are not disturbed and are included in the workplan and budgets of Challenge TB.

2. Priority recommendations

Priority recommendations	Responsible agency /person	Time frame
1. All available funding for PMDT scale up for the next 2 to 3 years from all sources needs to be clearly delineated, with a detailed breakdown by activity (e.g. diagnostic and drug commodity procurement, social support packages, sputum collection and transportation mechanisms, etc) and by partner. Subsequently, the current 2013 to 2017 PMDT Expansion Plan needs to be urgently reviewed and updated if needed.	NTP/WHO/Challenge TB (KNCV Tuberculosis Foundation [KNCV] /MSH)	By end of Q1 2015
2. The Government of Bangladesh should gradually increase its financial support to NTP. The engagement with donors and partners for financing needs to be continued in view of vision of NTP for Universal Access for diagnosis and treatment for all TB patients including patients with DR–TB.	GOB/MoH&FW/NTP	On–going
3. A smooth transition from TBCARE2 to Challenge TB needs to be ensured, and the key current TBCARE2 PMDT–related activities maintained in the Challenge TB workplan and budgets.	NTP/Challenge TB (KNCV/MSH)	Q2 – Q3 2015
4. Update diagnostic algorithms to align with latest WHO policies, especially on Xpert. Review whether planned diagnostic capacity will be sufficient to achieve the proposed testing targets.	NTP/WHO	Q2 2015
5. The current national laboratory strengthening plan needs to be updated, to ensure alignment of any increased laboratory capacity with management capacity for MDR–TB patients, with strict QA of smear microscopy services in place.	NTP/WHO	By end Q2 2015
6. Implementation of cPMDT activities needs to be further strengthened, and the socio–economic support package and training harmonized across all areas of the country.	NTP/In–country implementing partners	Q2 2015
7. The OR protocol for the SR9 should be finalised at the earliest, the required funding then sought from the respective agency, with a start date in the 1st half of 2015 being targeted.	NTP/WHO/USAID	By end of Q1 2015
8. Evaluate the current different models for provision of the required ancillary laboratory tests and ancillary drugs, and if applicable pilot more widely the different models for the provision of the required services.	NTP/WHO	By end of Q2 2015
9. The eTB Manager system needs to be fully	NTP/WHO/MSH–SIAPS	By end Q2

implemented, with all components functional. QuanTB needs to be updated on a monthly basis, which will require much closer coordination and information sharing across all the involved teams.		2015
10. The current second line drug (SLD) stocks at all levels, and national level orders, need to be reviewed closely and urgently. SLD orders are to be revised accordingly to meet the changing environment, including utilising the funds held by USAID for SLD procurement via the Global TB Drug Facility (GDF) to partially bridge any gaps in SLD supply for 2015–2016.	NTP/WHO/MSH–SIAPS	Review to be completed by end Q4 2014 Order placed by end Q2 2015 at latest

II. Detailed report

As a detailed review of NTP overall and the PMDT care and services was conducted during the 2014 JMM of the NTP in March–April 2014, during this short 2014 rGLC mission the author concentrated on the outcome of the GF NFM Concept Note application, the transition in activities in 2015 from TBCARE2 to Challenge TB, and the implications of these in regard to the planned expansion of PMDT. Field visits were limited in number and duration, with more time spent in discussion with NTP Central Office staff and staff of partner organizations based in Dhaka. As a result, for some of the sections below, the readers are referred to the report of the "JMM of the NTP, Bangladesh, 30 March to 10 April 2014" and the "2013 PMDT Monitoring Report".

A. Introduction/Background; and B. Existing TB control programme

Please refer to the report of the "JMM of the NTP, Bangladesh, 30 March to 10 April 2014" and the "2013 PMDT Monitoring Report" for details on these sections.

C. Information on M-/XDR-TB

The 1st Bangladesh National TB DRS, 2010–2011, estimated that the proportion of new cases with MDR–TB was 1.4% and 28.5% amongst the previously treated cases. Based on these figures, it was estimated that in 2012 the number of MDR–TB cases existing amongst the notified cases was around 4,200 (1,900 amongst the new cases and 2,300 in the previously treated cases). However a new estimate for 2013 has been revised upwards, and hence now it is estimated that there are around 4,700 MDR–TB cases existing amongst the notified cases, with 2,100 in the new cases and 2,600 in the previously treated cases (Table 1). NTP will need to start planning the 2nd National DRS, which should be conducted in the period 2015 to 2016.

In the original expansion plan, the planned 2,650 cases to be enroled on treatment in 2017 equated to 70% of the prevailing estimated number of MDR–TB cases that existed amongst the notified cases. However using the 2013 revised estimated number of MDR–TB cases that existed amongst the notified cases, the planned 2,650 cases only equates to 56% of the estimated number of MDR–TB cases (Table 2). And in 2013, overall TB case detection (i.e. notifications) was estimated by WHO to be only 53%. Hence the current expansion plan appears to fall well short of achieving the agreed universal access targets by 2017, never mind for 2015 as per the World Health Assembly resolution as endorsed by the GOB.

Table 1. Estimated burden of MDR–TB in Bangladesh, 2013

	Estimated MDR–TB patients amongst the notified cases	Confidence interval
Proportion of new PTB cases with MDR–TB	1.4%	0.7 – 2.5%
Proportion of previously treated TB cases with MDR–TB	29%	24 – 34%
Estimated number of MDR–TB cases amongst new PTB cases notified in 2013	2,100	1,000 – 3,700
Estimated number of MDR–TB cases amongst previously treated PTB cases notified in 2013	2,600	2,200 – 3,200
Total estimated number of MDR–TB cases amongst notified cases in 2013	4,700	3,200 – 6,900

Source: Global Tuberculosis Report 2014. WHO/HTM/TB/2014.08. Geneva, Switzerland: WHO; 2014

Table 2. Planned annual enrolments

Year	Number of MDR–TB cases to be enroled on treatment	Percentage of estimated cases (using 2013 estimate of 4,700 MDR–TB cases)
2013	1,000	21%
2014	1,400	30%
2015	1,900	40%
2016	2,300	49%
2017	2,650	56%
Total	9,250	

Source: Expansion Plan of PMDT, 2013 to 2017. 2nd Edition, Nov 2013. Dhaka, Bangladesh: MoH&FW; 2014

Although the number of cases enroled on treatment is increasing, compared to the estimated burden the numbers remain small. Also under the expansion plan, the enrolment targets for 2013 and 2014 respectively were 1,000 and 1,400 cases. However in 2013, only 684 patients were enroled on to treatment. And, as of October 2014, only 719 cases have been enroled on treatment in 2014. Thus the enrolment targets, low as they are, look like they will be not achieved in both 2013 and 2014. No impact on the epidemiology of MDR–TB is likely at these low levels of detection and treatment of cases.

Table 3. MDR–TB cases enroled on treatment

Year	Enroled on 24 months regimen	Enroled on 9 months regimen	Total enroled on treatment
2005 to 2007	–	242	242
2008	107	129	236
2009	179	181	360
2010	183	154	337
2011	253	137	390
2012	376	129	505
2013	495	189	684
2014 (as of end Oct)	547	172	719
Total	2,140	1,333	3,473

As treatment success rates amongst both new and relapse, and previously treated (excluding relapse cases) are both high at 92% and 82% respectively, the factors responsible for the generation of MDR–TB is open for further exploration. Areas for exploration could include: rates of isoniazid resistance amongst new cases and development of MDR–TB on first line drug treatment; influence on development of MDR–TB of the availability of anti–TB drugs in the open market with a vibrant and growing private sector; and implementation of infection control measures in health facilities and transmission of TB infection.

Recommendations

1. NTP to start planning for the 2nd DRS survey which should be conducted in 2015–2016. (NTP/WHO/United States Agency for International Development [USAID]; Q1 to Q2 2015)
2. NTP and partners to consider operational research studies to explore what are the drivers of the MDR−TB epidemic in Bangladesh. (NTP/WHO/Technical Partners; Q1 to Q2 2015)

D. Government commitment / PMDT plan including funding source

The NTP has secured substantial external funding for TB control since 2003. This has correlated with the growth and consolidation of critical programme activities. Bangladesh has received grants from the GF for TB control programme in Rounds 3, 5 and 8. The start date of the Round 8 Phase 2 coincided with the proposed date of the Round 10 proposal. The Round 10 proposal, therefore, integrated the entire Round 8 Phase 2 grant (Table 4). In addition, USAID through TB CAP/TBCARE has been providing support to NTP since 2008 with agreement in specific areas to supplement the NTP. Local NGOs are deeply involved in the implementation of the programme and use their own source of funding supplemented by grants from the GF as principal or sub-recipients (SR). The government is one of the GF Principal Recipients, with BRAC as the second PR. BRAC has 40 NGOs, one research organization and two corporate sectors, as SR partners involved in TB control. In addition, WHO provides technical support to the NTP.

GOB is responsible for salaries of government staff, infrastructure, training and some procurement such as part of first line medicines and laboratory supplies. TB is high in some district or divisional priority lists for health, however this is not uniform across the country.

Table 4. Funding TB control (figures in USD million)

	2011	2012	2013	2014	2015
Estimated funding need	50.436	52.977	55.457	57.926	59.323
GOB direct contribution	0.85	0.82	0.79	1.77 (for 2014– 16)	
GOB loans	0.97	0.74	1.03	2.2 (for 2014 –16)	
GF	26.681	31.853	33.29	38.384	40.14
Total GOB and GF	28.501	33.413	35.11		

Source: NTP, data provided during the JMM, March 2014.

From Table 4, it is clear that the activities of NTP are heavily dependent on external sources for funding. During the first half of 2014, an updated National Strategic Plan for TB Control, 2015 to 2020, was developed. Subsequent to this, a Concept Note was developed and submitted to the July 2014 Window of the GF's New Funding Model for review and anticipated funding. However a significantly lower amount of funding was approved by the GF than was requested and anticipated. Hence USD $66.6m has been approved against a requested amount of USD $106.9m. With some additional savings of USD $3.4 million, the GF NFM grant for the period up to December 2017 will total roughly USD $70 million. However no budget has been allocated in this total for procurement of additional Xpert machines and/or cartridges to supplement the current number in place in the country. In addition, there are funds budgeted for a total of only 1,337 (Year 1 [July 2015 – June 2016] 525; Year 2 [July 2016 – June 2017] 540; and Year 3 [July 2017 – Dec 2017] 272) patient SLD courses (under PR 1, roughly USD $3m) and the linked social support packages for the 1,337 patients (under PR 2, roughly USD $1.8m). The remainder of the GF NFM grant will be utilized to maintain basic TB services in the country.

From Table 5, it is observed that there are potential major shortfalls in funding for procurement of the SLDs even if NTP is to achieve the less than ambitious enrolments targets of the current 2013–2017 PMDT expansion plan. For example, 2,300 cases are planned to be enroled in 2016 on SLD treatment. Assuming that DF procures the 300 patient courses previously committed, GOB currently has committed funding from the GF NFM for only 535 patient courses. Hence for 2016, currently there appears to be committed funding for just 835 MDR–TB patient courses, whereas it is planned to enrol 2,300 patients on treatment. Funding for the SLDs for the other 1,465 patients needs to be identified quickly. A similar position most likely exists for the funding of the other required aspects of PMDT e.g. diagnostic services, patient support packages, etc.

Table 5. Scale up of MDR TB treatment based on type of regimen

Year	Number of MDR–TB cases to be enroled on treatment	SR9 by DF	SR9 by NTP	24 month regimen by NTP
2013	1,000	150	0	850
2014	1,400	200	450	750
2015	1,900	250	1400	250
2016	2,300	300	1750	250
2017	2,650	350	2000	300

Recommendations

3. All available funding for PMDT scale up for the next 2 to 3 years from all sources needs to be clearly delineated, with a detailed breakdown by activity (e.g. diagnostic and drug commodity procurement, social support packages, sputum collection and transportation mechanisms, etc) and by partner. Subsequently, the current 2013 to 2017 PMDT Expansion Plan needs to be urgently reviewed and updated if needed. (NTP/WHO/Challenge TB [KNCV/MSH]; By end of Q1 2015)
4. The Government of Bangladesh should gradually increase its financial support to NTP. The engagement with donors and partners for financing needs to be continued in view of vision of NTP for Universal Access for diagnosis and treatment for all TB patients including patients with DR−TB. (GOB/MoH&FW/NTP; On−going)

E. Partnerships-NGOs, private sector, etc
With the lower level of funding approved under the GF's NFM, there is likely to be a restructuring of the services provided by the NGO partners who are currently supported via the grant with the PR 2 (BRAC). It will be important that careful planning is done to alleviate any decrease in support via PR 2 to the current PMDT−related services provided.

Currently a wide range of PMDT−related activities are undertaken by URC under TBCARE2 support. These include: implementation and expansion of cPMDT activities to 35 districts; renovation of in−patient facilities at 8 CDHs and the XDR−TB ward at NIDCH; provision of 39 Xpert machines and cartridges, and 200 LED microscopes; social support and incentive packages to MDR−TB patients and their DOT Providers (DP); training for field staff; support to infection control and waste management; monitoring of care by DPs via mHealth systems in 34 districts; provision of a container C/DST in Sylhet; and various PMDT−related advocacy, community and social mobilization activities. However TBCARE2 activities will be ending in June 2015, with a transition to the new Challenge TB project. In addition, the current lead partner in Bangladesh for TBCARE2 activities, URC, will be changing under Challenge TB project to MSH.

From preliminary discussions with in−country partners held by the KNCV team (who were also visiting Dhaka during the time of the PMDT mission), Challenge TB activities may be focused on: expansion of the 9 month shorter regimen; procurement of a limited supply of Xpert cartridges for diagnosis of RR cases; provision of SL LPA at the NTRL; maintaining the current cPMDT activities, including the social support packages as provided under TBCARE2; and strengthening of sputum and collection networks.

Recommendations
5. A smooth transition from TBCARE2 to Challenge TB needs to be ensured, and the key current TBCARE2 PMDT−related activities maintained in the Challenge TB workplan and budgets. (NTP/Challenge TB [KNCV/MSH]; Q2–Q3 2015)

F. Advocacy and community engagement
Please refer to the report of the "JMM of the NTP, Bangladesh, 30 March to 10 April 2014" and the "2013 PMDT Monitoring Report" for details on this section.

G. Case finding strategy
The following groups of patients are defined as "suspects of drug resistant TB" and thus are the focus for DST:

1. Failures of Category II
2. Failures of Category I
3. Non-converters of Category II (remain smear positive at month 4)
4. Non-converters of Category I (remain smear positive at month 3)
5. All relapses
6. All return after default
7. Close contact of a MDR-TB patient with symptoms;
8. All TB/HIV infected patients at the start of TB therapy;
9. Others – Any smear negative or extrapulmonary TB patient clinically not improved in spite of treatment as per NTP guidelines

As has been commented on by previous missions, the proportion of retreatment cases out of the total smear positive PTB cases that are being registered under the NTP, appears to remain low. Even still it appears that less than 50% of the retreatment cases are provided with a DST. As reported to WHO by the country, 4,611 (49.8%) retreatment cases in 2013 were tested for RR–/MDR–TB out of total of 9,254 retreatment cases. The NTP now recommends that Xpert MTB/Rif is used as the primary diagnostic test for RR in those with presumptive DR−TB (Figure 1).

During the mission, it was reported that access to Xpert testing from the peripheral levels in some areas is limited due to the lack of sputum sample transportation systems. And from the available data, it appears that the available Xpert MTB/Rif capacity generally remains underutilized.

Although there has been progress in the two above areas since the last PMDT monitoring mission, further progress in identifying patients at risk of having MDR–TB disease, transporting their sputa to the respective laboratory and the DST being performed, needs to be closely monitored.

For those cases who unexpectedly are detected to have RR by Xpert MTB/Rif (e.g. new PTB cases

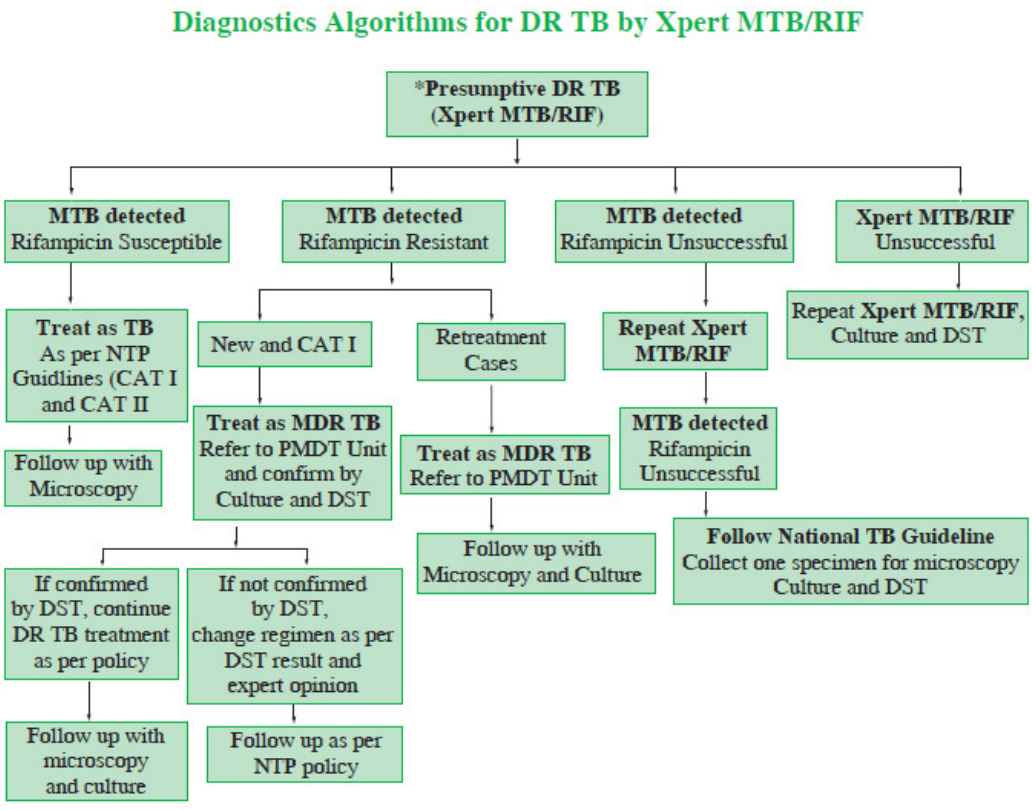
with no risk factors defining them as high or medium risk for DR–TB), the NTP policy currently includes the outdated recommendation to confirm the result by C/DST.

Despite the NTP having recommendations of which patients should have SL DST performed, capacity to undertake such DST is limited to the NTRL by C/DST, and the data is difficult to elicit in relation to number of patients tested and their results.

Recommendations

6. Adequate history taking of previous TB treatment needs to be ensured, and that correct classification of patients is done by health care providers. (NTP/In−country implementing partners; On−going)
7. 100% identification and DST by Xpert of all retreatment cases and other MDR−TB risk groups to be achieved by the end of 2015. Train all relevant staff on the protocols of when and whom to identify to test for drug resistance. (NTP/In−country implementing partners; By end of 2015)
8. Sputum collection and sample transportation networks to the Upazila level and those sites with the Xpert machines are to be strengthened. (NTP/In−country implementing partners; Q2 2015)
9. Diagnostic algorithms are to be updated to align with the latest WHO policies, especially in relation to the use of Xpert. Review whether the planned diagnostic capacity will be sufficient to achieve the testing targets as proposed in recommendation 7 above. (NTP/WHO; Q2 2015)
10. Further develop capacity for SL DST at the RTRLs. As an initial step for rapid SL DST to support the SR9 OR, introduce SL LPA at the NTRL. (NTP/WHO/Challenge TB [KNCV/MSH]; Q2–Q3 2015; By end of 2015)

Figure 1.



H. Laboratory services

Diagnostic capacity is expanding with an increased number of LED microscopes in place (200 added in 2014), the number of C/DST laboratories will increase in the near future from 3 to possibly 5 (currently the laboratories in in Khulna and Sylhet are under preparation), and an increased number of Xpert® MTB/RIF machines (now 39) are in place and being used as the primary and initial MDR-TB diagnostic test. The NTRL is linked to the Supra–National Reference

Laboratory in Antwerp, Belgium and participates in the regular rounds of validation of DST. The NTRL has been demonstrated to be proficient in both FL and SL DST.

Within the planned expansion of the laboratory capacity, by the end of 2014, there were meant to be 50 Xpert machines and 6 C/DST laboratories in place and functional. However to date there are only 39 Xpert machines in country and 3 C/DST laboratories in place and operational. There is also no budget under the GF NFM funds allocated for the procurement of any additional Xpert machines and cartridges to add to the current number in the country. Although there may be a budget allocation under Challenge TB for the procurement of a limited number of Xpert cartridges, there will be no allocation for any additional Xpert machines. Furthermore at the end of 2014, the laboratory capacity building activities in Bangladesh conducted under the EXPAND TB Initiative will end. However the existing Xpert capacity appears to be generally underutilized.

Table 6. Planned Laboratory Expansion

	2013	**2014**	**2015**	**2016**	**2017**
Xpert instruments (4 module) in Districts	25	40	64	64	64
Xpert instruments (4 module) in city corporations	10	10	11	14	16
Total Xpert (4 module) instruments in country	**35**	**50**	**75**	**78**	**80**
Xpert instruments (16 module) at NTRL	1	1	1	1	1
Number of districts/City Corps where specimen transportation systems for Xpert and for confirmation culture and DST exist	40/7	64/7	64/7	64/7	64/7
Number of solid culture and DST laboratories	**4**	**6**	**6**	**6**	**6**
Liquid culture (MGIT)	1	1	2	2	2
LPA molecular laboratory	1	1	2	2	2

Source: Expansion Plan of PMDT, 2013 to 2017. 2nd Edition. Dhaka, Bangladesh: MoH&FW; 2014

Recommendations

11. The current national laboratory strengthening plan needs to be updated, to ensure alignment of any increased laboratory capacity with management capacity for MDR–TB patients, with strict QA of smear microscopy services in place. (NTP/WHO; By end of Q2 2015)
12. The current laboratory capacity, especially that which was strengthened under EXPAND TB, needs to be maintained. The budgetary requirements needed to ensure this, should be included in the grant agreed with the GF under its NFM. (NTP; On–going)
13. A review of current diagnostic capacity and practices, with the aim of informing a process of prioritization of which patients should be tested by Xpert and better utilization of the existing Xpert capacity, needs to be conducted urgently. (NTP/WHO; By end of Q1 2015)

I. Treatment strategy

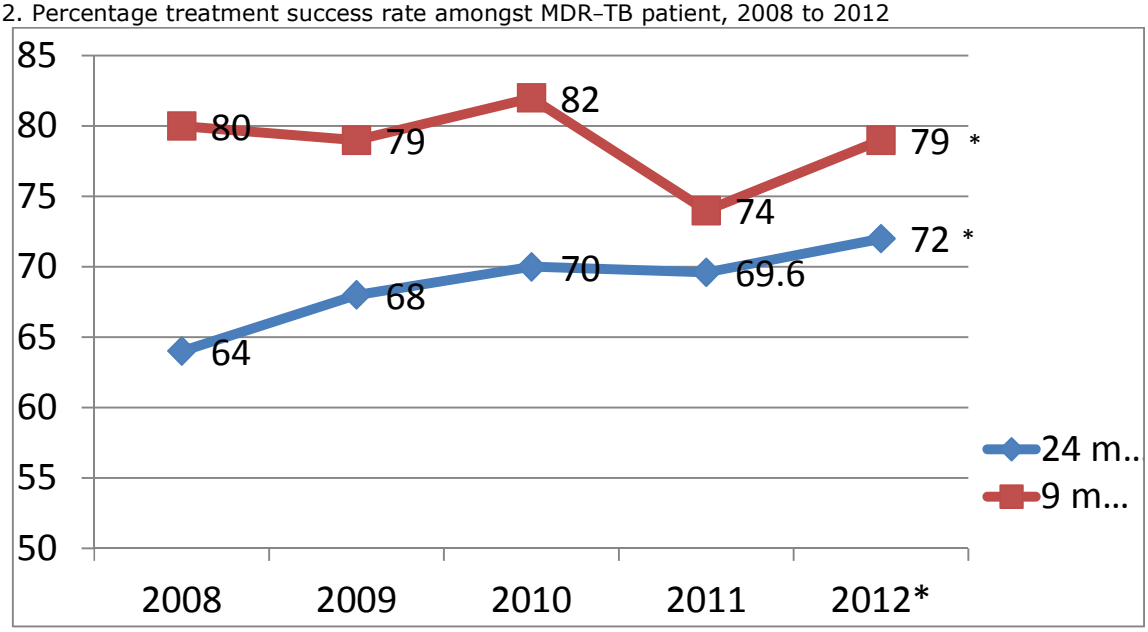
i. Regimen and model of care

Although a degree of harmonization of the models of care for MDR–TB patients has happened, there continues to be 2 quite different models being implemented in parallel in different areas of the country. These differ in relation to the treatment regimen used (in terms of duration and drugs used; a 9–month shorter regimen used in the DF areas and a 20–month WHO recommended in other areas), duration of hospitalization, use of community based PMDT approach and social support packages. An increasing number of patients are being detected and enrolled on treatment (684 in 2013, 719 as of October 2014). Treatment outcomes for patients treated with either the 20 month or shorter 9 month regimen, remain good at over 70% in the 2012 patient cohorts. The cPMDT approach has now been expanded to cover 35 districts. Under the cPMDT, the period of

hospitalization is reduced from 8 to 1-2 months. This will allow for an easier implementation of the GOB's plan to establish government hospitals for initial hospitalization of MDR–TB patients across the country in all 7 divisions. Currently there are 5 treatment sites under NTP where the 20-month regimen is used along with cPMDT, with a bed complement of around 300 beds. There are an additional 60 beds in DF facilities. The social support package for patients and incentives for DOT Provider are more widely implemented now. In addition, a pilot using mHealth monitoring of care by the DOT Providers has been introduced in 34 districts.

As of October 2014, a cumulative total of 3,473 patients have been enrolled on treatment. A total of 2,140 patients have been enroled for management with the GLC approved regimen (now at 5 treatment sites in NIDCH Dhaka, CDH Chittagong, CDH Pabna, CDH Khulna and CDH Sylhet). The annual treatment success rates of patients enrolled from 2008 to 2012 (January to June only) have ranged from 64% to 72%, increasing over time with the latest cohort having a 72% success rate. From May 2005 to October 2014, a total of 1,333 patients have been enroled for treatment with the shorter 9 month regimen. The annual treatment success rates of those patients enroled on the SR9 from 2008 to 2012 have ranged from 74% to 82%, with the latest cohort having a 79% success rate.

Figure 2. Percentage treatment success rate amongst MDR-TB patient, 2008 to 2012



* 24 m regimen: Jan-June, 9 m regimen: Jan-Dec

However although the treatment success rates are good at over 70%, whether the 24 month or the 9 month regimen are used, the total of patients being reported is still from a relatively small cohorts of patients. And although the cPMDT approach has been expanded to cover 35 districts now, not all 64 districts are fully and uniformly implementing cPMDT activities. Furthermore the planned expansion of the use of the 9-month shorter regimen has not yet even started. It is anticipated that by using the SR9 and the cPMDT approach together to manage a larger number of MDR–TB patients, the strengths of these 2 aspects of care will work synergistically, and lead to even higher treatment success rates in Bangladesh.

Recommendations

14. Implementation of cPMDT activities needs to be further strengthened, and the socio–economic support package and training harmonized across all areas of the country. (NTP/In–country implementing partners; Q2 2015)
15. The OR protocol for the SR9 should be finalised at the earliest, the required funding then sought from the respective agency, with a start date in the 1st half of 2015 being targeted. (NTP/WHO/USAID; By end of Q1 2015)

ii. Side-effects and follow up management

Although limited attention was paid to this area during the mission, it was observed that many of

the recommendations from earlier missions had not yet been met. Hence the patient safety programme for identification and management of adverse effects of drugs by DOT providers and establishment of linkages between the CDCs and CDHs for serious effects recommended by the 2013 rGLC, had not been met. Nor had the introduction of a monthly follow-up form, with the monthly follow up remaining a weak area of the PMDT implementation.

During the field visit to Narayanganj District, it was observed that the laboratory capacity in the public sector facilities for performing the necessary baseline and follow up tests was limited (e.g. the district hospital lacked the capacity to undertake liver and renal function tests). Hence patients were being referred to "reliable" private laboratories for the performance of the required tests. This necessitated in patients paying for such tests, usually out of the support packages that they were provided with. The author was informed that a pilot was being undertaken in Sylhet, whereby private laboratories were reimbursed by the public sector for the conducting of said required laboratory tests in cases where the capacity was lacking in the public sector to do such tests. This is a better system than the patient paying out of their pocket for such tests. Exploration should be done to determine whether it could be possible for the public sector to have formal agreements with "reliable" private laboratories for the performance of the required tests.

Recommendations

16. Evaluate the current different models for provision of the required ancillary laboratory tests and ancillary drugs, and if applicable pilot more widely the different models for the provision of the required services. (NTP/WHO; By end of Q2 2015)

J. Drug management

During the visits to the National level SLD warehouse in Shyamoli and the NIDCH, the physical storage facilities of the SLDs were observed to be adequate, with the paper based stock management system done well. However it was observed that the eTB Manager system remains not fully functional, particularly in regard to the MDR–TB and LMIS components. The MDR–TB component is currently only active at 1 (NIDCH) out of the 5 MDR–TB treatment sites. The details of the SLD stocks at the 5 MDR–TB treatment sites are hence not available via the eTB Manager system. Also at the Shyamoli warehouse, the only electronic recording of drug stocks is done by means of Excel sheets, apparently with no access to the eTB Manager system. Currently due to the prevailing environment related to the electronic availability of particularly real–time SLD stock details, QuanTB is not being fully utilised.

On the day of the visit to the Shyamoli SLD warehouse, it was observed that there was a minimal stock of levofloxacin (Lfx) 250mg tablets (n=27,210), with a seeming imbalance of Lfx, cycloserine (Cs) 250mg tablets (n=2,94,535) and ethionamide (Eto) 250 mg tables (n=7,16,890) available at the National level.

Currently there is no full time dedicated staff in the NTP Central Office for procurement and supplies management.

Recommendations

17. The eTB Manager system needs to be fully implemented, with all components functional. Quan TB needs to be updated on a monthly basis, which will require much closer coordination and information sharing across all the involved teams. (NTP/WHO/MSH–SIAPS; By end of Q2 2015)
18. The current SLD stocks at all levels, and national level orders, need to be reviewed closely and urgently. SLD orders are to be revised accordingly to meet the changing environment, including utilising the funds held by USAID for SLD procurement via GDF to partially bridge any gaps in SLD supply for 2015–2016. (NTP/WHO/MSH–SIAPS; Review to be completed by end Q4 2014. Order placed by end Q2 2015 at latest)

K. Recording and reporting, and data management, L. Infection control, M. Human resources, Training and Technical support strategy, and N. Supervision and monitoring of the programme

Please refer to the report of the "JMM of the NTP, Bangladesh, 30 March to 10 April 2014", the "2013 PMDT Monitoring Report" and elsewhere in this report for details and recommendations on these sections.

III. Annexures

Annex 1. Terms of Reference of the mission

- To assess present status, case finding, treatment strategies, administration and follow-up and evaluate the current achievement in managing DR−TB;
- To collect and analyze data on DR−TB patients on treatment;
- To assess situation with procurement and supply management of SLDs including ancillary drugs and other logistics by using QUAN TB in collaboration with MSH;
- To provide guidance on MIS specially on electronic data management for DR−TB programme;
- To assess laboratory services for DR−TB management including rapid diagnostic tools and infection control;
- To review draft protocol for shorter regimen (SR) and provide guidance and analyze the strengths and current feasibility of country wide expansion of SR;
- To provide guidance/recommendations for implementation of PMDT activities for next one year.

Annex 2. Programme of Dr DF Wares for the PMDT Monitoring Mission, 23−27 November 2014

Date	
22 November (Saturday)	Arrival in Dhaka
23 November (Sunday)	Briefing with NTP Visit National Institute of Diseases of the Chest & Hospital and the National TB Reference Laboratory
24 November (Monday)	Visit NGO run (Nari Maitree) Urban Primary Health Care Project clinic in Dhaka District Visit to National level warehouse for SLDs, Shymoli, Dhaka
25 November (Tuesday)	Visit to Narayanganj District: Civil Surgeon Office, Sadar UHC Office, District General (Victoria) Hospital, home visit to MDR−TB patient
26 November (Wednesday	Visit to URC Office, Dhaka Visit to MSH/SIAPS Office, Dhaka Report writing
27 November (Thursday)	Visit to BRAC Office, Dhaka Debriefing with NTP and partners (Afternoon) Departure from Dhaka (Evening)

Annex 3. List of key people met during the visit

MOH and NTP: Dr Md Quamrul Islam, Director MBDC & Line Director, TB−Leprosy, DGHS; Dr Ahmed Hussain Khan, Deputy Director MBDC & Programme Manager, TB, DGHS; Dr Chhewang Rinzin, International Finance Consultant (GF)

Academic Professionals: Dr Asif Mujtaba Mahmud, Associate Prof, IEDCR, Dhaka; Dr Mustafa Kamal**,** Associate Professor, Microbiology & Coordinator, NTRL, NICDH.

Narayanganj District: Dr Dulla Chowdhury, Civil Surgeon.

NGOs and other partners: Grace Hafner, Acting Country Project Director, MSH (Bangladesh); Dr ATM Sanaul Bashar, Senior Technical Advisor TB, MSH/SIAPS (Bangladesh); Mr Mohammed Golam Kibria Madhur Za, Senior Technical Advisor Quantification & MIS, MSH/SIAPS (Bangladesh); Dr Paul Daru, Technical Director, TB CARE II, URC, Bangladesh; Masuda Begum, Director Health, Nari Maitree & Project Manager, UPHCSDP, Dhaka; Dr Akramul Islam, Associate Director, HNPP, BRAC; Mr Sardar Ibna Mohsin, Senior Sector Specialist TB Control, BRAC; Dr Lisa Steven, USAID Bangladesh; Dr William Wells, USAID Washington DC, Dr Hamid Salim, Advisor to NTP on GF and MDR−TB; Dr Maarten van Cleeff, KNCV (Challenge TB), The Hague.

WHO: Dr N Paranietharan, WHO Representative, WHO Country Office Bangladesh.