Philippines
PMDT review
mission report
24-28 November 2014
Contents

1. Executive summary ............................................................................................................................. 5
   1.1. Summary recommendations ............................................................................................................. 6

2. Terms of reference .............................................................................................................................. 8

3. Background ......................................................................................................................................... 9
   3.1. Country ......................................................................................................................................... 9
   3.2. TB and MDR-TB epidemiology .................................................................................................... 9
   3.3. Health system .............................................................................................................................. 9
   3.4. Programmatic management of DR-TB (PMDT) .......................................................................... 10

4. Joint Program Review recommendations and progress update ...................................................... 11

5. Current status of PMDT implementation .......................................................................................... 14
   5.1. Update ........................................................................................................................................ 14
   5.2. Health system levels of PMDT implementation ......................................................................... 15

6. Places visited ..................................................................................................................................... 17
   6.1. San Lazaro Hospital ..................................................................................................................... 17
   6.2. Western Visayas Medical Centre, Iloilo city ................................................................................. 18
   6.3. Igbaras RHU ............................................................................................................................... 20
   6.4. Bacolod city Health Office ........................................................................................................... 20
   6.5. Pablo Torre Memorial Hospital (private) .................................................................................... 21
   6.6. Teresita L. Jalandoni Provincial Hospital ..................................................................................... 21
   6.7. Batasan Hills Super Health Center ........................................................................................... 22
   6.8. Toro Hills Health Center .......................................................................................................... 23

7. Findings ............................................................................................................................................. 25
   7.1. DR-TB case finding strategy and diagnostic algorithm .............................................................. 25
   7.2. Xpert MTB/RIF roll-out ............................................................................................................... 29
   7.3. Treatment and management of DR-TB ...................................................................................... 29
   7.4. Data management ....................................................................................................................... 32

8. References ......................................................................................................................................... 51

9. Annexes ............................................................................................................................................. 52
   9.1. Schedule of visits ........................................................................................................................ 52
   9.2. Visiting teams ............................................................................................................................ 52
   9.3. List of figures ............................................................................................................................. 53
   9.4. List of tables .............................................................................................................................. 53
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADR</td>
<td>Adverse drug reaction</td>
</tr>
<tr>
<td>CEM</td>
<td>Cohort Event Monitoring (a methodology of active pharmacovigilance)</td>
</tr>
<tr>
<td>CTRL</td>
<td>Cebu TB Regional Reference Laboratory</td>
</tr>
<tr>
<td>DOH</td>
<td>Department of Health</td>
</tr>
<tr>
<td>DPCB-IDPCD</td>
<td>Disease Prevention and Control Bureau – Infectious Diseases for Prevention and Control Division</td>
</tr>
<tr>
<td>DR-TB</td>
<td>Drug-resistant TB</td>
</tr>
<tr>
<td>DST</td>
<td>Drug susceptibility testing</td>
</tr>
<tr>
<td>EMR</td>
<td>Electronic medical record</td>
</tr>
<tr>
<td>GeneXpert</td>
<td>Testing platform (diagnostic instrument) for cartridge based assays, including Xpert MTB/RIF</td>
</tr>
<tr>
<td>GFATM</td>
<td>Global Fund to Fight AIDS, TB and Malaria</td>
</tr>
<tr>
<td>GLC</td>
<td>Green Light Committee (global mechanism for access to technical assistance and approval for concessional-priced second line drugs for MDR-TB; regional structures retaining the GLC acronym were created in 2011)</td>
</tr>
<tr>
<td>ITIS</td>
<td>Integrated Tuberculosis Information System</td>
</tr>
<tr>
<td>KMITS</td>
<td>Knowledge Management and Information Technology Service</td>
</tr>
<tr>
<td>LCP</td>
<td>Lung Center of the Philippines</td>
</tr>
<tr>
<td>MDR-TB</td>
<td>Multidrug-resistant TB</td>
</tr>
<tr>
<td>MSH</td>
<td>Management Sciences for Health</td>
</tr>
<tr>
<td>NCR</td>
<td>National Capital Region</td>
</tr>
<tr>
<td>NTP</td>
<td>National TB Programme</td>
</tr>
<tr>
<td>NTRL</td>
<td>National TB Reference Laboratory</td>
</tr>
<tr>
<td>PMDT</td>
<td>Programmatic Management of Drug-resistant TB</td>
</tr>
<tr>
<td>PMO</td>
<td>PMDT program management office of the NTP</td>
</tr>
<tr>
<td>PV</td>
<td>Pharmacovigilance</td>
</tr>
<tr>
<td>RCC</td>
<td>Rolling Continuing Channel of GFATM Grant</td>
</tr>
<tr>
<td>RITM</td>
<td>Research Institute of Tropical Medicine</td>
</tr>
<tr>
<td>RR-TB</td>
<td>Rifampicin-resistant TB</td>
</tr>
<tr>
<td>SLD</td>
<td>Second-line drug(s)</td>
</tr>
<tr>
<td>STCs</td>
<td>Satellite Treatment Centers</td>
</tr>
<tr>
<td>SIAPS</td>
<td>Systems for Improved Access to Pharmaceuticals and Services (USAID programme to support safe drug use implemented by MSH)</td>
</tr>
<tr>
<td>TCs</td>
<td>PMDT Treatment Centers</td>
</tr>
<tr>
<td>XDR-TB</td>
<td>Extensively drug-resistant TB</td>
</tr>
<tr>
<td>Xpert MTB/RIF</td>
<td>Cartridge based assay on GeneXpert platform that employs an automated real-time nucleic acid amplification technology for rapid and simultaneous detection of tuberculosis and rifampicin resistance.</td>
</tr>
</tbody>
</table>
Acknowledgements

The monitoring team wishes to acknowledge colleagues from the Department of Health, National TB Control Program, National TB Reference Laboratory, Lung Center of Philippines, Philippines Business for Social Progress and the treatment centers visited, for the commitment, motivation and hospitality.

Writing Group

**WHO HQ, Regional and Country offices:**
Fuad Mirzayev, Dennis Falzon, Tauhid Islam, Tom Hiatt, Woo-Jin Lew

**GF:**
Mohammed Yassin, Qi Cui, Wilson Lo

**NTP Philippines:**
Rosalind Vianzon, Celine Garfin, Maricel Trono, Ramon Basilio, Donna Gaviola, Voltaire Guadalupe

**Lung Center of Philippines:**
Vivian Lofranco, Stuart Pancho, Vincent BALANAG, Mary Rosary SANTIAGO, Nerissa DONATO, Joan SAMOYTHY, Dario DEFENSOR, Randolf LEPPAGO, Ma Theresa MONNETT

**NTRL:**
Noel Macalalad, Cindy Ama, Cristino NARCISO, Cristina VILLARICO, Althea PEREZ, Ian BUSTAMANTE, Eddie SISTOSO

**PBSP:**
Arnyl Araneta, Franco Bonifacio

**MSH/SIAPS:**
Princess Mangao, Michael GABRA

**KMITS:**
Andro Gutierrez

**Batangas Medical Center:**
Ramoncito MAGNAYE

**Grace Park Health Center (Caloocan City, Manila):**
Jon Mamaril, Dennis S Manahan, Donnabel Lacanilao

**Dr. Jose N. Rodriguez Memorial Hospital (Caloocan City, Manila):**
Alfredo S Lobo

**IMPACT:**
Ruth Chi

**TASC:**
Marl Mantala

**USAID:**
Kathryn Roa

**Pharmacovigilance Unit, Food and Drug Administration of the Philippines (FDA):**
Lanette Lee A. Querubin
1. Executive summary

The scale-up of PMDT in Philippines leans on a solid foundation of many years of experience at different levels of the healthcare and is rather impressive allowing all identified DR-TB cases to initiate appropriate treatment. The diagnostic capacity is being boosted by the Xpert MTB/RIF implementation, trained personnel is available even in some lower level treatment sites and no recent stock outs or gaps in SLDs procurement were reported.

At the GeneXpert sites already functional, time-to-result is reported to be short, usually not exceeding 7 days and is improving. Innovative solutions to decrease this time are being considered. All sites with access to Xpert MTB/RIF testing had reasonable times from Xpert MTB/RIF based diagnosis to the initiation of treatment - ranging from 3 to 14 days, although with some outliers that were patient related and less provider related. In the treatment centers visited, there were no waiting lists and no lack of second line medicines. Treatment was organized on ambulatory basis and both capacity and the trained staff were available.

PMDT implementation is well supported by the range of administrative and operational support documents and personnel involved are well informed and knowledgeable. Although being a fairly recent reform, the PMDT coordination is integrated into the TB programme at the regional level, and integration of PMDT and basic DOTS is gradually starting in some locations.

Diagnostic algorithm with inclusion of Xpert MTB/RIF assay is being implemented countrywide and testing of presumptive DR-TB cases is increasing with the roll-out of GeneXpert instruments to additional locations and treatment sites.

The ongoing roll-out of GeneXpert instruments is following the national plan and decisions on placement are taken based on the relevant criteria. GeneXpert instruments at the sites visited during the mission were utilized optimally, with some extra capacity available in case of further expansion.

PMDT implementation follows strict DOT based on ambulatory care with only seriously ill patients being hospitalized. Adverse drug reactions represent a serious problem but no unusual or particularly severe side effects were reported at the sites visited during the mission and no specific difference in frequency or presentation of the ADRs were observed. A range of ancillary medicines was available in all sites and medical staff was well aware of the indications. ADRs were sited as one of the main reasons for the loss to follow up while on DR-TB treatment along with the financial and access to treatment constrains, which validates and supports findings of the recent review of this problem performed by the NTP together with its technical partners.

A well-thought enablers package has been put in place with the support of the GF grant to Philippines and includes both the incremental milestone awards to patients to improve retention and a transportation allowance to facilitate access to healthcare and alleviate sometimes prohibiting transportation costs. The transportation allowance was frequently referred to as being inflexible and insufficient, both by healthcare staff in direct contact with patients and patients themselves. The transportation costs incurred by the patients are highly variable, depend on the distance and mode of transportation. In places visited, based on the reports of the nurses and from a few reports by the patients, these costs were higher than the transportation allowance (even at its highest bracket). A feature that was considered problematic was that transportation allowance is provided on the reimbursement scheme and is not advanced. The main implementer of the GF grant that supports the enablers package, the NGO called Philippines Business for Social Progress (PBSP), is developing patient friendly and front-loaded schemes to provide transportation allowances and make them a truly “enabler” and not a partial reimbursement of the money spent by patients to access their daily dosage of treatment.

The most prominent problem of the PMDT is unusually high and increasing rate of loss to follow up. This problem is likely to be related to the rapid PMDT expansion with multiple factors that contribute to this phenomenon and those listed above (ADR and access to care) are the salient ones.
While management of the ADR will be important to ensure retention on treatment and more training and expanded/revised range of ancillary medicines can help, decentralization of PMDT is the only other and perhaps even more effective measure to solve the problem of access to treatment and decrease the loss to follow up.

If this problem is not solved promptly and prior to the significant expansion programmed to take place in 2015-17 with stable and substantial support from the NFM GF grant, it will create unnecessarily elevated risk of even higher numbers of patients interrupting MDR-TB treatment with all related potential consequences of increasing mortality, DR-TB transmission in the communities and amplification of drug resistance patterns.

Insofar as informatics is concerned there has been an impressive drive in the recent years to reinforce the management of data for both drug-susceptible and resistant patients in the NTP. The creation and successful launch of the electronic Integrated TB Information System (ITIS) - with its own staff base to support implementation, maintenance and training – represents the centerpiece of this work, but not the totality, given that other efforts have gone into the simultaneous updating and roll out of recording and reporting paper systems and aligning these parameters with the latest WHO recommendations. The recommendations made by this mission are prioritized based on the most pressing dimensions of PMDT that the programme should be monitoring, particularly case detection, enrolment and outcomes of patients. Most of the recommendations are expected to be implemented before the end of 2016. They build upon the substantial progress achieved up to now.

The mission came to the conclusion that the next priorities in terms of system implementation and development should focus closely on the needs of the end-user. ITIS has been successfully deployed peripherally but in the process added a significant workload on the health workers. The system has been driven mostly as a surveillance tool. The end-users need to find the right motivation (i.e. the system needs to help them carry out their daily work better) if they are to develop the system further in a sustainable manner. They need to perceive, for instance, that there is a plan to phase out paper reporting and that their recording and reporting requirements will be lessened in the near future. Right now this is not the case.

The other priority is for ITIS to conform fully with the WHO set of PMDT indicators, particularly those focused on detection. At this point in time the most important gap is the inability of the system to provide comprehensive and accurate values of the numbers of individual RR-/MDR-TB patients and the proportion of TB patients with results for rifampicin (+/- isoniazid) susceptibility by different risk category of patient. Having a good handle on where the patients are being or not being detected and how many are diagnosed and are eligible for MDR-TB treatment are crucial indicators for managers to have and act upon, particularly at this juncture where PMDT scale-up is the byword.

1.1. Summary recommendations

1.1.1. Case finding

1. Roll-out of Xpert MTB/RIF testing is fast paced and ongoing with more instruments to be placed during 2015. A careful review and assessment of the testing needs and referral routes (of patients and/or samples) is needed both before placing the additional instruments but also after the testing sites are well established and exhibit some extra capacity that can be utilized.

2. To better understand the current referral practices based on the existing policy and identify reasons for the high proportion of individuals with negative Xpert MTB/RIF results among retreatment and other presumptive DR-TB groups, an assessment of the groups of patients referred for Xpert MTB/RIF testing is recommended in 2015.
1.1.2. Case management

3. Decentralization of PMDT and as early as possible during the course of treatment and further integration with the “basic DOTS” TB care may have a serious impact to reverse the high rates of loss to follow up. This process has been piloted in several sites and can be expanded already in 2015. Wider expansion will require thorough planning and preparation by the NTP.

4. With expansion and decentralization of PMDT it is important to expand training on management of ADR to the staff at decentralized treatment sites. Trainings will need to be planned to match wider expansion as mentioned in point 3.

5. Changing enablers scheme into a front-loaded scheme, more flexibility and possible increase of the transportation allowances will be useful to influence the rate of loss to follow up while on treatment. This approach has been piloted and can be implemented in 2015.

6. It is recommended to revise and expand list of available ancillary medicines for PMDT in 2015.

7. It is recommended to boost interaction between healthcare workers and DR-TB patients, step up/improve health education activities to reduce number of patients diagnosed with DR-TB but not initiating treatment.

8. Implementation of shorter regimens for DR-TB and introduction of new anti-TB drugs under appropriate conditions will contribute to the retention on treatment and may also improve treatment outcomes.

1.1.3. Data management for PMDT

9. There needs to be a progressive replacement of the paper-based system with electronic elements as ITIS implementation moves ahead. A timeline for this process needs to be developed, advancing in a phased manner (to remove paper registers and reports by the end of 2017). If the system is to evolve to the level where data entry at the point of patient interaction is electronic (i.e. an EMR) then greater mobility and flexibility of access needs to be ensured (timeline depends on programme decision to go to EMR).

10. Efforts to increase coverage of data for both the DOTS and PMDT components should expand. An attempt should be made to register on ITIS at least a minimum dataset for all TB cases diagnosed by the programme (staggered implementation to 100% coverage by the end of 2017). For this to be done adequately more centers would need to be provided with access and most likely the interfaces used to enter and access diversified (e.g., greater use of smartphones, tablet computers or laptops.

11. Another clear priority is the creation of a specific laboratory module (to be created and piloted by the end of 2015; to implement fully in all the DST labs at least by the end of 2016). Getting the laboratories to register the susceptibility test results online is expected to cut down on turnaround time and provide the labs in return with a method to generate their own activity reports. It would also, conceivably, avert the repeat counting of the same individual tested using different methods.

12. The recording of adverse drug reactions would need to allow for active pharmacovigilance data for patients being treated with new or repurposed drugs and novel regimens (needs to be in place for all patients on new drugs and short regimens enrolled in CEM).

13. In order to be in conformity with the WHO minimum requirements for PMDT reporting it is important that early attention is given to fix the problems in generating the Detection set (coverage of R-resistance testing by risk category, accurate enumeration of cases eligible for MDR-TB treatment and estimation of interval between presumption and test results) (needs to be aligned with the pace of item 10 above and therefore by the end of 2017).
2. Terms of reference

1. To review status of JPR recommendations with regards to PMDT implementation
2. To review implementation status of diagnostic algorithms and integration of new diagnostics into these algorithms
3. To validate the current PMDT scale up plan and implementation:
   a. To review diagnosis and treatment capacity alignment in the implementation of PMDT
   b. To review Xpert MTB/RIF roll out and its impact on PMDT in view of increase of case detection and time to treatment
   c. To review existing and potential barriers to scale up of both DR-TB diagnosis and treatment (barriers to broader scale up, suboptimal use of new diagnostics, DR-TB patients waiting lists)
4. To validate compliance to international standards and comprehensiveness of the PMDT information management system
   a. Assess the current system for recording and reporting of drug-resistant TB (definitions, indicators and periodicity of reporting) for conformity with the parameters recommended by WHO, including reporting of adverse drug reactions
   b. Assess the functionality of the electronic system introduced for recording of data on drug-resistant patients
   c. Examine the records in the laboratories, Xpert testing sites and treatment centers and linkages between them for standard quality dimensions (completeness, uniqueness, timeliness, validity, accuracy and consistency)
5. Propose any necessary modifications in the short and long term and outlines the resources that will be required to effect these changes and if possible any likely sources of funding.
3. Background

3.1. Country

Philippines, quick facts:

- Country in Southeastern Asia, archipelago of 7100 Islands between the Philippine Sea and the South China Sea, east of Vietnam
- 64th largest country in the world
- Population of 99,874,258
- 7th most populous in Asia
- 12th most populous in the world
- 37.5% of population below poverty line
- Island groups of Luzon, Visayas and Mindanao
- Manila is the Capital City
- 17 geographical regions

3.2. TB and MDR-TB epidemiology

The country’s health profile depicts a distinct epidemiologic and demographic transition characterized by double burden of diseases consisting of communicable diseases (which require major public health intervention) and non-communicable diseases (which need expensive curative and chronic-care intervention). This scenario makes the country’s health profile a “hybrid” or combination of health situations found in both developed and developing countries. The health status of the country therefore can be best described to be at the crossroads of infectious and non-communicable diseases.

In addition to being among the 22 high burden countries for drug sensitive TB, the Philippines is one of the 27 high multidrug-resistant TB (MDR-TB) burden countries in the world. The 2012 national anti-tuberculosis drug resistance survey reported that the prevalence of MDR-TB was 2% among new cases and 21% among retreatment cases. In 2013, estimates of MDR-TB cases among notified pulmonary cases were 4,400 among new and 4,100 among retreatment cases.

- TB case notifications 2013, new and relapse cases – 229’918
- Previously treated, excluding relapses – 14’474
- Laboratory confirmed RR-/MDR-TB 2013 – 3’962

3.3. Health system

The health system in the Philippines is highly decentralized. There are five tiers, including national, regional, provincial/city, municipal and barangay (village). The Department of Health (DOH) has a central office and regional offices called Centers for Health Development (CHDs), including one in Autonomous Region in Muslim Mindanao. Provincial Health Offices (PHOs) are under the provincial governors, while City Health Offices (CHOs) and Rural Health Units/Health Centers (RHUs/HCs) are administered by mayors. TB case detection and cure rates are monitored among the core performance indicators of each of the Local Government Units (LGUs); and are reported in annual “LGU Scorecards” that are available nationally.

In its current decentralized setting, the Philippine health system has the Department of Health (DOH) serving as the governing agency, and both local government units (LGUs) and the private sector providing services to communities and individuals. The DOH is mandated to provide national policy direction and develop national plans, technical standards and guidelines on health. Under the Local Government Code of 1991, LGUs were granted autonomy and responsibility for their own health services, but were to receive guidance from the DOH through the Centers for Health Development (CHDs). Provincial governments are mandated to provide secondary hospital care,
while city and municipal administrations are charged with providing primary care, including maternal and child care, nutrition services, and direct service functions. Rural health units (RHUs) were created for every municipality in the country in the 1950s to improve access to health care.

The private sector, which is much larger than the public sector in terms of human, financial and technological resources, is composed of for-profit and non-profit providers that cater to 30% of the population. Although the private health sector is regulated by the DOH and the Philippine Health Insurance Corporation (PhilHealth), health information generated by private providers is generally absent in the information system of the DOH. Regulation of health science schools and universities is under the Commission on Higher Education, while the regulation of health professionals is carried out by the Professional Regulation Commission. The PhilHealth provides a reimbursement package to cover outpatient TB services for drug susceptible TB in children and adults. The management of DR-TB is not currently included in this package.

**3.4. Programmatic management of DR-TB (PMDT)**

The management of DR-TB in the Philippines started in 1999 in a private DOTS clinic—Makati Medical Center of Tropical Disease Foundation (TDF) and was one of the first Green Light Committee (GLC) approved pilot projects.

In 2003, the Philippines’ Global Fund grant proposal for Round 2 was approved and one of the components was to treat 500 patients suffering from MDR-TB. Additional treatment centers were established and the DR-TB management has seriously expanded. In 2006, Round 5 proposal of the country to the Global Fund was successful and cohort of cases to be treated was expanded to 2,500 MDR-TB cases for the period of 2006-2011. This development paved the way for the further mainstreaming of DR-TB services to the National TB Control Program aside from the involvement of the public sector through the Lung Center of Philippines (LCP), and the public health centers through decentralization (community TB care) of MDR-TB cases. More facilities in the public and private sectors were involved as treatment centers and the National TB Reference Laboratory (NTRL) was engaged to establish a laboratory network in the country to support DR-TB management.

In 2008, the implementing guideline for Programmatic Management of Drug-resistant TB (PMDT) was signed by the Secretary of Health setting the mandate to support PMDT in the country.

In 2009, the stewardship in implementing the PMDT was transferred to the Department of Health (DOH), with the LCP designated as the main technical arm and the PBSP as the implementing partner. A transition plan was set with the objective of ensuring the continuity of quality services to drug-resistant TB patients, strengthening of DOH technical and managerial capacity of PMDT, and to prepare DOH/LCP in acquiring GLC approval.

In 2012, the second phase of the Rolling Continuing Channel (RCC) GFATM Grant was approved to support the NTP in treating 7,903 cases of MDR-TB until 2014. With the New Funding Model concept note in 2013, Philippines adopted even more challenging goals for the PMDT and its further expansion.
4. Joint Program Review recommendations and progress update

Summary Challenges for PMDT

PMDT has been implemented in a relatively independent and isolated manner, and has not yet been fully integrated with the national DOTS programme. An MOP and the PMDT sub-plan has been developed, highlighting challenges of PMDT and outlining the direction of full integration of PMDT services into DOTS facilities and further expansion of PMDT with an increased target of cases for enrollment.

Summary Recommendations for PMDT

PMDT scale-up must be planned and executed through the NTP structure (NTP, NTRL, LCP). With further scale-up of diagnosis anticipated and decentralization of treatment being recommended, the solid foundation of the existing DOTS network that can support patients all the way to their communities must similarly be the foundation for the management of drug-resistant cases.

<table>
<thead>
<tr>
<th>A. Case finding for drug-resistant TB</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>All DOTS facilities should ensure and PMDT coordinator monitor 100% testing for drug resistance among retreatment TB cases and new cases with high risk of drug resistant TB; PMDT PMO should monitor and improve the adequacy of testing coverage among the risk groups by measuring the gap between diagnosed and estimated MDR cases</td>
<td>Ongoing. New MOP stipulates all presumptive DR-TB cases to undergo screening using Xpert MTB/RIF. Numbers of screened are rising, depending on the roll-out of GeneXpert sites and the mechanism to monitor the testing and evaluate reaching the 100% target is needed.</td>
</tr>
<tr>
<td>RHUs nurses should routinely monitor the number of presumptive drug-resistant TB cases, whether they indeed visit the TC, whether examinations are done, what testing results are, and whether patients with rifampicin resistance are enrolled on treatment.</td>
<td>Ongoing. The monitoring mechanism needs to be fully established and rolled out to gather results at the national level.</td>
</tr>
<tr>
<td>NTP manager and PMDT coordinator should address transportation barrier of patients' travel to TC/STC for diagnosis and enrolment on treatment</td>
<td>Ongoing. The package of enablers is being rolled out by the PBSP with support of the GF grant but requires further development and more flexibility.</td>
</tr>
<tr>
<td>PMDT coordinator should pilot a new approach in which sputum specimens for Xpert tests are collected at selected RHUs and sent directly to the laboratory for testing.</td>
<td>From STC this approach is being implemented. May need to explore sample transport mechanism via courier from lower level of health centers.</td>
</tr>
<tr>
<td>PMDT PMO should conduct research to investigate the reason for the high proportion of Xpert tests among presumptive DR-TB cases that were M. tuberculosis negative.</td>
<td>Needs to be done (analysis of suspect register)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Barriers to MDR-TB treatment</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>RHU nurses should inform patients of Xpert results and ensure that patients with RMP resistance are counselled and enrolled for Cat IV treatment.</td>
<td>Ongoing. However, referral of patients is in many cases done through the TC or STC and not via direct interaction with RHUs, which may introduce complexity and delays.</td>
</tr>
<tr>
<td>PMDT coordinator should develop a plan to address patients' financial barriers in enrolment for treatment, and to decentralize drug-resistant treatment as early as possible.</td>
<td>Enablers package is being implemented and various models of closer to patient approach are being piloted such as Community Provided Care (ComPCare) and integrated DOTS (iDOTS) and need to be accelerated.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C. Treatment of MDR-TB</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale up the availability of treatment (NTP and LCP). The JPR endorses the proposed scale-up of treatment targets to 19,500 patients put on second-line treatment by 2016, while seriously addressing the high rate of loss to follow-up.</td>
<td>Scale up of PMDT is happening, more delegation to the regions and more integration with DOTS. Review of the plans and acceleration of implementation of iDOTS is needed to effectively scale up PMDT.</td>
</tr>
</tbody>
</table>
Decentralize treatment to support treatment success. The JPR prioritizes the achievement of a 75% treatment success among drug resistant cases. The JPR recommends a concurrent decentralization of the treatment of drug resistant cases to trained RHUs and BHWs.

| National consilium should regularly supervise regional consilium, and ensure that coordinators of regional consilium are well trained in clinical management of drug-resistant TB. | Ongoing. More simplification and streamlining is needed to eliminate any delays related to this process. |
| Consilium should minimize advice on individualized treatment, especially in patients with delayed release of DST results. | Xpert MTB/RIF testing is helping to bridge direct access to standard treatment regimen without delay, also decreasing the empiric treatment. |
| PMDT coordinator to organize a task force to elaborate on benefits & risks of routinely adding INH in cases with RMP resistance by Xpert test. | INH is not a component of the currently used standardised treatment regimen. |

### D. Case holding, high risk interrupters, and outcome of treatment

| Address the high rate of loss to follow-up among patients treated for MDR-TB (NTP and partners, including PMDT coordinator). | OR is being done by TDF. Apparently a multifactor phenomenon with different weight of main factors depending on the site. All factors need to be addressed simultaneously to achieve reduction. |
| Test the applicability of a shorter (9-month) MDR-TB regimen under research conditions (NTP and NCPR/LCP). | Ongoing. The approach is defined, plan is written and reviewed, commented by the WHO and supported by the GF with relevant finding needs covered. Currently ongoing the ethical review by the ethical board. Expected start – March 2015. |

To reduce high default rate and to ensure enrolment of MDR-TB patients on treatment, PMDT coordinator in collaboration with NTP Manager should urgently develop a plan to 1) strengthen capacity of RHUs for early decentralization of MDR-TB patients (through addressing HR issues, provision of trainings, supervision and necessary commodities, including medications), 2) address patients’ financial barrier in adherence to treatment, including using innovative, sustainable and country-specific incentives tailored according to the needs of patients, 3) strengthen health workers’ ability in addressing adverse drug reactions among MDR-TB patients, 4) conduct operational research to understand the reason for patients to default (specifically target defaulted patients), and 5) pilot short course MDR-TB regimen (9-12 months) under research conditions.

### E. Supervision, data management, drug management

| PMDT coordinator should strengthen PMDT supervision at all levels and in all aspects including drug management; engagement of regional/provincial staff in PMDT supervision should be increased. | Done. NTP was reorganised, PMDT management delegated to regions. Further integration of PMDT into DOTS activities is needed. |
| NTP Manager should ensure that the reporting module of Integrated TB Information System (ITIS) will be developed and that human resources needed to make the ITIS fully functional for management of MDR patient data will be in place. | Ongoing. Entering data is challenging in some places with a significant backlog. Reporting features of the ITIS are not utilised to the full extent yet. ITIS is still under ongoing development and improvement, internet access is another main challenge in regions. |
| PMDT coordinator should develop a plan to improve the timeliness of unutilized drug retrieval from TS to TC, and TC/STC to PMO. | Ongoing. |

### F. Sustainability of PMDT

| NTP manager and PMDT coordinator should strengthen advocacy for sustainability of drug-resistant TB program using domestic funds and pursue inclusion of MDR-TB in PhilHealth schemes. | Ongoing. Evaluation and costing of the PMDT package is underway to be followed by the negotiations to include it into PhilHealth. |
Innovative support to patients from external funding should consider requiring some form of counterpart funding from the national or LGU budgets (Donors).

Covered by the GF until end of 2016. Urgent need to develop national schemes for enabling patients or reimbursement and make ongoing efforts sustainable in the future.

<table>
<thead>
<tr>
<th>G. Engagement of the private sector in PMDT</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTP should develop a sustainable framework for systematically engaging private providers in PMDT ensuring ample site preparation and availability of technical assistance and supervision whenever necessary.</td>
<td>Ongoing. Some examples of private health sector are already available and are successful, providing entry to the network of private doctors and clinics but more efforts are necessary.</td>
</tr>
</tbody>
</table>
5. Current status of PMDT implementation

5.1. Update

The Philippine Plan of Action to Control TB (PhilPACT) maps the actions and strategy for 2010-2016. In 2013, the Philippines was one of the early applicants for the New Funding Model of the Global Fund Grant for Tuberculosis. With the leadership of the NTP, and with help from a number of stakeholders and partners, the country submitted its concept note for TB control in the Philippines. Alongside this endeavor, the country embarked on a Joint Program Review (JPR). This involved several international technical experts on TB, as well as local TB experts. The country used the JPR recommendations to revise the PhilPACT as well as enhance the GF Concept Note. Specifically for PMDT, the country decided to increase its targets for detection of MDR-TB cases from a cumulative total of 15,000 to 19,500 by the end of 2016. A target for treatment success was also added, to reach 75% treatment success rate. This is in line with the general recommendations of the JPR which were: (1) finding all TB cases, and (2) ensuring that all cases are cured. The third general recommendation was securing an enabling environment for TB control. PMDT was then viewed as a separate parallel program that needed to be integrated into the NTP network. The DOH’s Infectious Disease Office (IDO) was empowered to manage PMDT within its framework. The new, 5th edition of the NTP Manual of Procedures (MOP) was completed in 2013. This manual integrated policies for case finding, case holding and health systems support of PMDT to the NTP framework of activities.

Starting from 2014, activities such as advocacy, expansion of facilities and laboratories, monitoring and evaluation, recording and reporting, and drugs and supplies management are being supervised by the DOH’s Regional Offices (ROs) through their NTP regional coordinators. Training of PMDT staff and overall management of PMDT-related research remains under coordination of the LCP. The management of the TB laboratory network, including the scale-up and expansion of GeneXpert facilities, culture laboratories and DST laboratories is under responsibility of the National TB Reference Laboratory. Distribution of drugs and supplies is coordinated by the DOH’s Materials Management Division (MMD). Procurement of SLDs is managed by PBSP. Lastly, the Integrated TB Information System (ITIS) is rolled out by the Knowledge Management and Information Technology Service of the DOH.

Figure 5-1. Philippines Department of Health organogram for PMDT
Table 1. PMDT in Philippines, indicators and targets

<table>
<thead>
<tr>
<th>Objective/Indicator</th>
<th>3-Year Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of presumptive DRTB screened (using Xpert MTB/RIF assay)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>2014</strong></td>
<td>22008</td>
</tr>
<tr>
<td><strong>2015</strong></td>
<td>26190</td>
</tr>
<tr>
<td><strong>2016</strong></td>
<td>31062</td>
</tr>
<tr>
<td><strong>Number of DR-TB Detected</strong></td>
<td></td>
</tr>
<tr>
<td><strong>2014</strong></td>
<td>3668</td>
</tr>
<tr>
<td><strong>2015</strong></td>
<td>4365</td>
</tr>
<tr>
<td><strong>2016</strong></td>
<td>5177</td>
</tr>
<tr>
<td><strong>Case Notification Rate</strong></td>
<td>43%</td>
</tr>
<tr>
<td><strong>2015</strong></td>
<td>51%</td>
</tr>
<tr>
<td><strong>2016</strong></td>
<td>61%</td>
</tr>
<tr>
<td><strong>Number of enrolled for treatment among detected</strong></td>
<td></td>
</tr>
<tr>
<td><strong>2014</strong></td>
<td>3668</td>
</tr>
<tr>
<td><strong>2015</strong></td>
<td>4365</td>
</tr>
<tr>
<td><strong>2016</strong></td>
<td>5177</td>
</tr>
<tr>
<td><strong>Proportion of patients with negative culture after 6 months of treatment</strong></td>
<td>85%</td>
</tr>
<tr>
<td><strong>2015</strong></td>
<td>85%</td>
</tr>
<tr>
<td><strong>2016</strong></td>
<td>85%</td>
</tr>
<tr>
<td><strong>Treatment Success Rate</strong></td>
<td>75%</td>
</tr>
<tr>
<td><strong>2015</strong></td>
<td>75%</td>
</tr>
<tr>
<td><strong>2016</strong></td>
<td>75%</td>
</tr>
</tbody>
</table>

Table 2. Targets by type of facility

<table>
<thead>
<tr>
<th>FACILITY</th>
<th>PhilPACT TARGET</th>
<th>Updated Targets - 2016</th>
<th>To be established / procured</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB Culture Center</td>
<td>25</td>
<td>29</td>
<td>16</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>DST Center</td>
<td>5</td>
<td>7</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>LPA facility</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>GeneXpert site</td>
<td>0</td>
<td>180</td>
<td>160</td>
<td>80</td>
<td>80</td>
<td>0</td>
</tr>
<tr>
<td>Treatment Center</td>
<td>35</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Satellite Treatment Center</td>
<td>0</td>
<td>110</td>
<td>86</td>
<td>68</td>
<td>18</td>
<td>0</td>
</tr>
<tr>
<td>iDOTS facilities</td>
<td>0</td>
<td>10% of DOTS faculties</td>
<td>300</td>
<td>20</td>
<td>180</td>
<td>100</td>
</tr>
</tbody>
</table>

5.2. Health system levels of PMDT implementation

The PMDT treatment facilities and laboratories are currently being managed by the National TB Control Program through the different DOH – regional offices and the National TB Reference Laboratory respectively. The implementation of the PMDT program is being funded mainly by the Global Fund grant. The treatment facilities screen all presumptive DR-TB patients and send specimens to laboratories for confirmation. These treatment facilities maybe a treatment center (TC), a satellite treatment center (STC), or a treatment site (TS).

The Treatment Center (TC) does the screening of the patients and sending of the sputum specimen to the PMDT laboratories. The TC also initiates patient treatment until patient finishes the treatment. The Satellite Treatment Center (STC) will perform the same tasks as TC only on a smaller scale. The Treatment Sites (TS) also screen and send specimen to accredited laboratories but will only manage patient’s treatment during the continuation phase. The TC is usually a provincial/city hospital that covers the province with a population of around 1 million, the STC is in most of the cases located at a district hospital serving a cluster of municipalities with population of around 200,000 and the so-called TS are selected DOTS health centers/RHUs serving a municipality with population of around 50,000.
### Table 3. PMDT expansion 2003-2014

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NCR</td>
<td>Region 7</td>
<td>Region 1</td>
<td>CAR</td>
<td>Region 4B</td>
<td>Region 2</td>
<td>ARMM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Region 4A</td>
<td>Region 6</td>
<td>Region 3</td>
<td>Region 5</td>
<td>Region 9</td>
<td>Region 8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Region 10</td>
<td>Region 12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Region 11</td>
<td>CARAGA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of Gx Labs</td>
<td>16</td>
<td>17</td>
<td>24</td>
<td>73</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New No. of Facilities</td>
<td>5</td>
<td>1</td>
<td>5</td>
<td>15</td>
<td>12</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Cumulative No. of Facilities</td>
<td>6</td>
<td>11</td>
<td>26</td>
<td>38</td>
<td>44</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>No of patient Notified/enrolled</td>
<td>761</td>
<td>530</td>
<td>569</td>
<td>870</td>
<td>2569</td>
<td>2056</td>
<td>2390</td>
</tr>
<tr>
<td>Treatment outcome (as %)</td>
<td>64%</td>
<td>57%</td>
<td>46%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6. Places visited

The locations for field visits were selected by the NTP using the following several criteria:

- to represent different levels of the PMDT network (TC, STC, TS);
- to show sites that have started implementation only recently and those that are implementing PMDT for several years;
- to include both public and private sector based health centers;
- sites with Xpert MTB/RIF testing on site and those referring patients or samples for testing elsewhere;
- sites in metro Manila and those geographically remote from the central NTP and under responsibility of regional health offices.

6.1. San Lazaro Hospital

Location: Santa Cruz, Metro Manila
Date of the visit: 24 November 2014
Health system level for PMDT: Treatment Center

One of the PMDT Treatment Centers (TC) are located in the San Lazaro Hospital in Manila and caters for the patients in its coverage area from 2011 starting before the roll-out of Xpert MTB/RIF testing in 2013.

Table 4. San Lazaro Hospital enrollments

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Lazaro PMDT Treatment center</td>
<td>Screened</td>
<td>Enrolled</td>
<td>Screened</td>
<td>Enrolled</td>
</tr>
<tr>
<td></td>
<td>520</td>
<td>186</td>
<td>925</td>
<td>198</td>
</tr>
</tbody>
</table>

Table 5. San Lazaro Hospital treatment outcomes (2011)

<table>
<thead>
<tr>
<th></th>
<th>Success</th>
<th>Died</th>
<th>Lost to follow up</th>
<th>Failed</th>
<th>ongoing</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Lazaro Hosp.</td>
<td>34%</td>
<td>18%</td>
<td>46%</td>
<td>1%</td>
<td>1%</td>
</tr>
</tbody>
</table>

Some MDR-TB presumptive cases were enrolled on Cat IV treatment empirically in 2011-2012 and part of them were reverted to Cat II treatment after return of DST results showing pansusceptible strains. All patients are cared for on the outpatient basis as in all other PMDT treatment centers with only a few in-patient beds available in case of need.

There was a significant decrease of the treatment start delays since the introduction of the Xpert MTB/RIF testing and at most is 20 days current year (excluding some outliers). The delay is reported to be client related and not provider related. Some patients need recurrent follow up to make sure they actually start treatment and in most of the cases a close to one week delay is caused by the need of the administrative document (attestation of the current address from barangay) that is requested by the TC, primarily to ensure treatment follow-up.

Loss to follow up is very high and is potentially increasing with expansion in numbers of patients but trend is difficult to set as many patients are still undergoing treatment. Worthwhile to note that a group of (small number) MDR-TB patients with HIV co-infection are reported to have high mortality rates but significantly less loss to follow up.
6.2. Western Visayas Medical Centre, Iloilo city

Location: Iloilo city, Province of Iloilo (Panay Island)
Date of the visit: 25 November 2014
Health system level for PMDT: Treatment Center

Western Visayas Medical Center (WVMC) in Iloilo city is a multipurpose hospital serving multimillion population in the Western Visayas and it also avails of the PMDT TC and a smaller DOTS treatment center in a separate location at the hospital premises. Western Visayas consists of 6 provinces, 14 cities, 117 municipalities (4,051 barangays) with a total population of 7,5 million.

The PMDT TC is a center with PMDT starting back in 2011. The center has an MD on staff, several nurses and ancillary health workers. Most of the other 5 PMDT facilities in Western Visayas became functional only in 2012 or 2014 and only 4 GeneXpert sites are currently functional in the region (in Silay city, Aklan and Antique) including one in WVMC. In addition to the Xpert testing, hospital has a TB culture laboratory, all DST, when needed, are referred to the regional reference laboratory in Cebu.

Target PMDT enrollment set by the NTP for the region in 2014 is 235 with 118 cases having been enrolled as of end of September 2014 (45 enrolled in WVMC).

Table 6. Western Visayas Medical Center enrollments.

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>W. Visayas MC.</td>
<td>Screened</td>
<td>Enrolled</td>
<td>Screened</td>
<td>Enrolled</td>
</tr>
<tr>
<td></td>
<td>223</td>
<td>71</td>
<td>171</td>
<td>40</td>
</tr>
</tbody>
</table>

There is a small number of RR-TB detected patients not enrolled on treatment and tracing of these cases presents a challenge as some of them do not have permanent addresses or have changed the address several times.

Laboratory

Culture laboratory is mostly used for the monitoring of treatment and isolating strains for subsequent DST. Same staff member is in charge of the Xpert MTB/RIF testing and smear microscopy, appears to be seriously overworked although a new staff member has started last month, thanks to the GF grant funding. GeneXpert instrument is well utilized with an average number of 8 tests per day, which also means that some capacity is still available if HR situation improves.

Table 7. Xpert testing in Western Visayas Medical center

<table>
<thead>
<tr>
<th>GeneXpert facility in Western Visayas Medical Center</th>
<th>2014</th>
<th>no MTB</th>
<th>MTB detected</th>
<th>ERROR</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>WVMC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
All patients with presumption of MDR-TB are referred for the Xpert testing following the risk groups of presumptive cases as outlined in the MOP. An interesting finding is that more than half of all patients suspected of having MDR-TB are not confirmed having TB by the Xpert MTB/RIF (64%). From those confirmed of having TB, 39% also have Rifampicin resistance (RR), which is above of the national average from last DRS (21% in retreatment cases). This is probably caused by the selection of patients suspected of having MDR-TB for screening with Xpert MTB/RIF, where many symptomatic cases with previous history of TB treatment (automatically considered as cases with presumptive MDR-TB) do not suffer from TB (resulting in big proportion of non-confirmed) and those who have TB also having failed several TB course in the past. To better understand this phenomenon, a more detailed analysis of the records from several GeneXpert sites and the reasons for referral are necessary.

**Treatment**

Treatment is usually initiated in a week from the results being available and is almost invariably outpatient. Two beds are available for complicated cases. Many patients experience adverse drug effects with the most prominent being GI upset, vomiting and joint pains. Protonamide is referred to as a most probably cause of the vomiting and ramping of the dosage is in usual practice.

Table 8. Western Visayas Medical Center Cat IV treatment outcomes (2011)

<table>
<thead>
<tr>
<th></th>
<th>Success</th>
<th>Died</th>
<th>Lost to follow up</th>
<th>Failed</th>
<th>ongoing</th>
</tr>
</thead>
<tbody>
<tr>
<td>W. Visayas MC.</td>
<td>45%</td>
<td>12%</td>
<td>43%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Loss to follow up is quite high, masks and doesn’t allow any conclusions on the treatment success rates (as lost to follow up patients could have had favorable or unfavorable outcomes). Better understanding and prompt resolution of the problems leading to this high rate are urgently needed in this and other PMDT centers to make sure the numbers do not increase with now programmed expansion of the PMDT countrywide.

Main causes of the loss to follow up are considered to be adverse drug reactions (ADR) and the financial constraints for patients to remain on treatment and travel to the center six times a week to receive their daily dosage of SLDs. No particularly severe ADRs are reported and the pattern is a familiar set of ADRs with the regimen provided. The package of enablers is available through the PBSP but the part of it that relates to the transportation allowance was considered seriously insufficient.
6.3. Igbaras RHU

Location: Igbaras Municipal Health Office, Province of Iloilo (Panay Island)
Date of the visit: 25 November 2014
Health system level for PMDT: Treatment Site

This municipal health center in Igbaras is an example of a lower level health facility catering to the population of approximately 70,000. The center is following up the susceptible TB treatment and has a small microscopy laboratory. Recently, some patients on the continuation phase have been “decentralized” to continue treatment under supervision of this facility. The distance from patient to the center is dramatically shorter compared to the TC in Western Visayas for example and it appears to favor a significantly smaller numbers of patients lost to follow up, although total number of patients on treatment was fairly small in this RHU.

A brief interview with an MDR-TB patient attending his regular DOT revealed a few relevant findings. The patient valued decentralization of treatment that is now closer for him and takes less travel time. However, the cost of travel has now increased as the center is still not at a walking distance and the modes of public transportation available are actually more expensive - no buses (jeepneys), they run between bigger towns, and the only alternatives being a tricycle or a motorcycle are also at least three times more expensive than the jeepney. This highlights the importance of the transportation allowance being more flexible than it is currently.

6.4. Bacolod city Health Office

Location: Bacolod city, Province of Negros Occidental
Date of the visit: 26 November 2014
Health system level for PMDT: no treatment of DR-TB, GeneXpert site

Bacolod city Health office is a coordinating center for both TB and DR-TB management in the Bacolod area and several parts of Negros Occidental. No treatment of DR-TB takes place in this facility and all patients are referred to the treatment center at Pablo Torre Memorial Hospital, which
is a private hospital. All patients receiving their treatment in the Bacolod city Health Office have susceptible forms of TB.

Although no treatment of DR-TB take place here, one GeneXpert instrument (provided by TBXpert project) has been recently installed in a separate room adjacent to the OPD, was validated and may start testing anytime. This Xpert site in addition to the presumptive DR-TB cases will be testing all sputum smear (-) cases with abnormal CXR, children and PLHIV.

### 6.5. Pablo Torre Memorial Hospital (private)

**Location:** Bacolod city, Province of Negros Occidental  
**Date of the visit:** 26 November 2014  
**Health system level for PMDT: Treatment Center**

PMDT treatment center has been established in the Pablo Torre Memorial Hospital and started to enroll patients on 27 October 2011. Its catchment area for PMDT is most of Negros Occidental.

Patients are not charged for the treatment as it is subsidized and SLDs are provided by the PBSP, as well as ancillary medicines and the enablers package. There is no so called “halfway home” or temporary residence for patients from remote areas and this is complicating access to treatment. The enablers package was also referred to be seriously insufficient for the same reasons as in other locations. The TC being hosted by the private sector hospital provides an evidence that this model is feasible and can function well. The great advantage of this TC is that it readily attracts referrals from the private MDs in its catchment area, therefore providing very much needed linkage between TB care services in the private and public sectors.

The hospital hosts a well-organized culture laboratory on-site, usually used for the treatment follow-up of MDR-TB patients and also growing strains for further DST for first line drugs, for which strains are sent to the regional DST laboratory in Cebu. The referral of strains is not yet fully formalized in terms of transportation and some challenges exist. From the review of the laboratory records and the report is was apparent that from the beginning of 2014, there was not a single culture that have grown, which is possible but surprising as it is in striking contrast with previous year. A review of currently used decontamination procedure was proposed by the NTRL.

#### Table 9. Pablo Torre Memorial Hospital enrollments

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTMH</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screened</td>
<td>37</td>
<td>218</td>
<td>540</td>
<td>674</td>
</tr>
<tr>
<td>Enrolled</td>
<td>8</td>
<td>51</td>
<td>69</td>
<td>60</td>
</tr>
<tr>
<td>Detected (GX)</td>
<td>540</td>
<td>69</td>
<td>59</td>
<td>674</td>
</tr>
<tr>
<td>Enrolled</td>
<td>51</td>
<td>69</td>
<td>59</td>
<td>60</td>
</tr>
</tbody>
</table>

Proportion of patients lost to follow up while on MDR-TB treatment is quite high and is 50% for the cohort enrolled in 2011.

#### Table 10. Treatment outcomes in Pablo Torre Memorial Hospital (2011)

<table>
<thead>
<tr>
<th></th>
<th>Success</th>
<th>Died</th>
<th>Lost to follow up</th>
<th>Failed</th>
<th>Ongoing</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTMH</td>
<td>38%</td>
<td>13%</td>
<td>50%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

### 6.6. Teresita L. Jalandoni Provincial Hospital

**Location:** Silay city, Province of Negros Occidental  
**Date of the visit:** 26 November 2014
**Health system level for PMDT: Satellite Treatment Center**

STC in Teresita Jalandoni Provincial hospital is linked to the TC in Bacolod city and at the time of the visit had 18 MDR-TB patients on treatment. All PMDT is organized on the outpatient basis and from all patients on treatment in 2014 there was only one lost to follow up (although numbers are small). This was a contrasted finding and appeared to be mostly related to the proximity of the STC to the patients it catered for.

This STC also has a GeneXpert site that started operations in July 2012. This allows the center to have a complete set of both diagnostic and treatment services on-site, making it more attractive and largely eliminating delays between diagnosis and treatment as both diagnostic consumables and SLDs are available complementing a well-trained and dedicated staff.

<table>
<thead>
<tr>
<th>2014</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TJPH</td>
<td>Screened</td>
<td>Detected (GX)</td>
<td>Enrolled</td>
</tr>
<tr>
<td>50</td>
<td>8</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

**6.7. Batasan Hills Super Health Center**

*Location: Metro Manila, Quezon city*
*Date of the visit: 27 November 2014*

**Health system level for PMDT: Satellite Treatment Center**

This TC is located in a densely populated and developing area of the Quezon city (3 million total population) in metro Manila and serves a population of more than 0.5 million. It is a multipurpose health center with antenatal, dental, childcare, general OPD, TB and an HIV clinic. First DR-TB patients were enrolled in 2012 and 54 are currently on treatment (48 in continuation phase).

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Batasan Hills Health center</td>
<td>Screened</td>
<td>Enrolled</td>
<td>Screened</td>
<td>Enrolled</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>0</td>
<td>102</td>
<td>18</td>
</tr>
</tbody>
</table>

The most recent report on treatment outcomes of DR-TB cases shows high rate of loss to follow up (50%). Main reasons for default as reported by the nurse in charge were:

- ADRs (GI upset, joint pains)
- treatment stopped as patient felt better with less TB symptoms
- patients changing addresses, difficult to trace retain.

This STC has experience of organizing a fully community based treatment of susceptible TB patients, currently it is not used to introduce community based PMDT.
6.8. Toro Hills Health Center

Location: Metro Manila, Quezon city
Date of the visit: 27 November 2014
Health system level for PMDT: Treatment Site

PMDT Treatment Site at Toro Hills Health Center provides services to the population of about 70,000-80,000 and is one of the still rare integrated DOTS facilities that feature treatment provision for both susceptible and DR-TB at the same place. The site also provides referral for Xpert testing and the referral is usually to the LCP, results are available in just a few days on average.

In total, this treatment site has provided treatment to 15 MDR-TB patients so far, 12 of them completed treatment successfully, 2 transferred out and only 1 patient defaulted. This treatment site is another example of the decentralized PMDT, which appears to generate less loss to follow up while on Cat IV treatment.
Figure 6-2. Sites visited in metro Manila
7. Findings

The scale-up of PMDT in Philippines is well founded on already many years of experience at different levels of the healthcare and is rather impressive, allowing all identified DR-TB cases to initiate appropriate treatment. The diagnostic capacity is being boosted by the Xpert MTB/RIF implementation, trained personnel is available even in some lower level treatment sites and no recent stock outs or gaps in SLDs procurement were reported.

At the GeneXpert sites already functional, time-to-result is reported to be short, usually not exceeding 7 days and is improving. Innovative solutions to decrease this time are being considered. All sites with access to Xpert MTB/RIF testing had reasonable times from Xpert MTB/RIF based diagnosis to the initiation of treatment - ranging from 3 to 14 days, although with some outliers that were patient related and less provider related. In the treatment centers visited, there were no waiting lists and no shortages of second line medicines. Treatment was organized on ambulatory basis and both capacity and the trained staff were available.

PMDT implementation is supported by the range of administrative and operational support documents and personnel involved are well informed and knowledgeable. Although being a fairly recent reform, the PMDT coordination is integrated into the TB programme at the regional level, and integration of PMDT and basic DOTS is gradually starting in selected locations.

7.1. DR-TB case finding strategy and diagnostic algorithm

The ongoing roll-out of GeneXpert instruments is following the national plan and decisions on placement are taken based on the relevant criteria. GeneXpert instruments at the sites visited during the mission were utilized optimally, with some extra capacity available in case of further expansion.

The current national policy for the DR-TB case finding is to use Xpert MTB/RIF assay for screening several specific groups of patients and individuals presumed to have DR-TB. Group of individuals with presumptive DR-TB includes the following:

- retreatment cases, PLHIV with signs and symptoms of TB,
- contacts of the MDR-TB patient,
- non-converters of the Cat I treatment.

Retreatment cases are divided into: relapse cases, treatment after failure (TAF), treatment after loss to follow up (TALF) and previous treatment outcome unknown (PTOU). PTOU cases are most of the times those referred from the private sector.

More recently, in 2014, with the roll-out of GeneXpert instruments in the country, this policy was enhanced to include Xpert MTB/RIF testing for several additional groups of individuals (only in the direct catchment area of the Xpert site): children with presumptive TB, patients with extrapulmonary TB and individuals with negative sputum smear microscopy and abnormal chest X-ray. This policy is active only in a few locations and expansion is expected in 2015.

The NTP is making good efforts to collect the results of Xpert MTB/RIF testing on the national level and data are aggregated and simplified into a fewer categories (although the laboratory request forms have all the detailed information). The graph below is visualizing the data available and the aggregation method currently employed to summarize Xpert MTB/RIF results at the national level.
The detailed national data with granularity according to the lab request form was not available at the time of the visit and not all numbers were available in a fully validated format for the year 2014. This has limited the analysis but allowed to make several observations.

Jan-Sept 2014, national data from 22 GeneXpert sites\(^1\) (some discrepancy is obvious but is not a major one) shows that in more than 60% of all tested, \(M.\) \emph{tuberculosis} was not detected by Xpert MTB/RIF. Among those who had TB, about one third demonstrated Rifampicin resistance.

Table 13. Xpert MTB/RIF testing results in Philippines, January-September 2014

<table>
<thead>
<tr>
<th>Total examined</th>
<th>MTB Positive</th>
<th>MTB Not Detected</th>
</tr>
</thead>
<tbody>
<tr>
<td>12,535</td>
<td>4,469 (36%)</td>
<td>7,759 (62%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Positive Result</th>
<th>Rifampicin Resistant</th>
<th>Rifampicin Susceptible</th>
<th>Rifampicin Indeterminate</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,469</td>
<td>1,604 (36%)</td>
<td>2,869</td>
<td>70</td>
</tr>
</tbody>
</table>

A very high proportion of \(M.\) \emph{tuberculosis} negative Xpert MTB/RIF results in Philippines is most probably related to the selection of subjects referred to the testing. A substantial proportion of these individuals do not have TB and most probably are both smear and culture negative. It is therefore important to analyze the proportion of smear positive and smear negative cases within both groups - with TB detected or not detected with Xpert MTB/RIF, and find out to what extent Xpert MTB/RIF has been used as an add-on test following a negative smear microscopy result. It would also be important to assess the proportional size of different groups that contribute to the aggregated national level classification of Xpert results, which is only possible if the testing site level

\(^1\) Courtesy of Dr Macalalad
data is collected. Unfortunately, none of these data are currently being reported upstream. For example, how many cases from group of “treatment after failure”, “treatment after loss to follow up” or “contacts of an MDR-TB” contribute to either positive, “no MTB” or Rifampicin resistance results of Xpert MTB/RIF testing?

**Recommendation**

To better understand the current referral practices based on the existing policy and identify reasons for the high proportion of individuals with negative Xpert MTB/RIF results among re-treatment and other presumptive DR-TB groups, an assessment of the groups of patients referred for Xpert MTB/RIF testing is recommended in 2015.

**Table 14. Distribution of all Xpert MTB/RIF tests by treatment history of referred presumptive DR-TB cases**

<table>
<thead>
<tr>
<th>2014</th>
<th>New</th>
<th>Relapse</th>
<th>Other Retreatment</th>
<th>Unknown</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>2941</td>
<td>23.5%</td>
<td>3152</td>
<td>25.1%</td>
<td>6114</td>
</tr>
</tbody>
</table>

The aggregated national data available (January-September 2014) shows approximately 50/50 division between the groups of “New+Relapse” and “Retreatment”. Disaggregated data of Xpert MTB/RIF results by the testing group was only available at testing facility level and is presented below for the San Lazaro Hospital, which was one of the GeneXpert sites with a fairly big number of tests performed during the same period in 2014. This testing site exhibits a higher proportion of the “New” category of referred for testing – 70% of almost 1,000 tests performed at this site.

Expectedly, proportion of “MTB not detected” is higher in New and Relapse cases and lower in Retreatment cases suspected of having DR-TB.

**Table 15. Results of Xpert testing in San Lazaro Hospital GeneXpert site**

<table>
<thead>
<tr>
<th>San Lazaro Hosp.</th>
<th>Examined</th>
<th>MTB</th>
<th>RR*</th>
<th>RS*</th>
<th>R indeterminate</th>
<th>MTB not detected</th>
</tr>
</thead>
<tbody>
<tr>
<td>New</td>
<td>69.8%</td>
<td>697</td>
<td>273</td>
<td>88</td>
<td>185</td>
<td>7</td>
</tr>
<tr>
<td>Relapse</td>
<td>13.5%</td>
<td>135</td>
<td>34</td>
<td>15</td>
<td>19</td>
<td>2</td>
</tr>
<tr>
<td>Previous treatment</td>
<td>16.7%</td>
<td>167</td>
<td>73</td>
<td>25</td>
<td>48</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>999</td>
<td>380</td>
<td>128</td>
<td>252</td>
<td>11</td>
</tr>
</tbody>
</table>

*subset of MTB column

With the high proportions of confirmed RR-TB among three groups presented in the table below it would be rather interesting for the programme to find out which of the referred for testing groups (TAF, TALF, PTOU, contacts of MDR-TB case or Cat I non-converters) contribute to the RR-TB the most. This analysis will be also important for better understanding of the referral practices by the TB care facilities and to further improve the diagnostic algorithm for Xpert MTB/RIF testing.

**Table 16. San Lazaro hospital GeneXpert site testing results by treatment history and R resistance**

<table>
<thead>
<tr>
<th>San Lazaro hosp.</th>
<th>RR</th>
<th>RS</th>
<th>MTB</th>
</tr>
</thead>
<tbody>
<tr>
<td>New</td>
<td>88</td>
<td>185</td>
<td>273</td>
</tr>
<tr>
<td>Relapse</td>
<td>32%</td>
<td>68%</td>
<td>34</td>
</tr>
<tr>
<td>Previous treatment</td>
<td>25</td>
<td>48</td>
<td>73</td>
</tr>
<tr>
<td>total</td>
<td>128</td>
<td>252</td>
<td>380</td>
</tr>
</tbody>
</table>
Xpert MTB/RIF is not only a tool to identify Rifampicin resistance but also a great test to identify TB, hence this wide approach that is apparently being taken by the sites referring patients or samples for Xpert MTB/RIF testing can only be encouraged.

A particular part of the current algorithm that would benefit from this analysis is highlighted below in the algorithm diagram (dotted line). Currently, all cases of presumptive DR-TB with a negative sputum smear and an abnormal chest X-ray after testing positive for TB and showing Rifampicin resistance on Xpert MTB/RIF are tested a second time in order to verify the first result. While this practice is recommended by the WHO in patients considered to be at low risk of MDR-TB, in Philippines, all smear negative cases referred to the Xpert testing as being presumptive of DR-TB do not necessarily qualify to be at low risk of MDR-TB. Therefore, repeating the Xpert test for this, most probably numerous group will lead to a delay of effective treatment initiation and also will lead to some difficult to justify overuse of Xpert MTB/RIF cartridges.

Given the current practice of referral it would be important to help healthcare workers by specifying a groups within presumptive DR-TB referrals that may need to be re-tested, based on the deeper analysis of the frequency of RR-TB in the current groups within the New presumptive DR-TB cases.

If this line of the diagnostic algorithm refers to the DSSM (-) with abnormal CXR from the additional group of cases (not presumptive DR-TB) that will be tested in the Xpert testing site coverage area, this will need to be specified and made clear on the algorithm diagram.

Figure 7-2. Diagnostic algorithm using Xpert MTB/RIF in Philippines

---

7.2. **Xpert MTB/RIF roll-out**

At the time of the visit there were 76 GeneXpert instruments installed and used in Philippines, with a few of them used exclusively for training at the NTRL. The increase to 118 instruments is planned with additional instruments and cartridges funded by the GF and the TBXpert project supported by UNITAID.

Table 17. Number of GeneXpert sites in Philippines by year.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Gx Labs</td>
<td>NCR Region 7 Region 1 Region 4A Region 6 Region 5 Region 9 Region 10 Region 12 Region 11 CARAGA Region 2 Region 3 Region 8</td>
<td>16</td>
<td>17</td>
<td>24</td>
<td>73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New No. of Facilities</td>
<td>5</td>
<td>1</td>
<td>5</td>
<td>15</td>
<td>12</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Cumulative No. of Facilities</td>
<td>6</td>
<td>11</td>
<td>26</td>
<td>38</td>
<td>44</td>
<td>54</td>
<td></td>
</tr>
</tbody>
</table>

With the roll-out and scale up of testing more patients with TB and RR-TB will be identified. This prospective development will require additional efforts to follow up identified patients and ensure initiation of treatment. In 2012, among patients with RR-TB resistance by Xpert, only 66% were enrolled on treatment. Some patients did not return for results of the Xpert test and some refused treatment for the following reasons: 1) financial barriers (transportation fee, need to earn money to support family), 2) not willing to disrupt work schedule, and 3) lengthy Cat IV treatment duration.

Enrolling all identified DR-TB patients on an appropriate treatment and retaining them to complete the treatment course, are two paramount objectives for the PMDT in Philippines.

**Recommendation**

Roll-out of Xpert MTB/RIF testing is fast paced and ongoing with more instruments to be placed during 2015. A careful review and assessment of the testing needs and referral routes (of patients and/or samples) is needed both before placing the additional instruments but also after the testing sites are well established and exhibit some extra capacity that can be utilized.

7.3. **Treatment and management of DR-TB**

PMDT implementation follows strict DOT based on ambulatory care with only complicated, seriously ill patients being hospitalized. Adverse drug reactions represent a serious problem but no unusual or particularly severe side effects were reported at the sites visited during the field visits and no specific difference in frequency or presentation of the ADRs were observed. A range of ancillary medicines was available in all sites and medical staff was well aware of the indications. ADRs were cited as one of the main reasons for the loss to follow up while on DR-TB treatment along with the financial and access to treatment center constrains, which validates and supports the findings of a recent study of this problem performed by the NTP together with its technical partners.

---

3 Evaluation of Reasons for Patients’ Loss to Follow-up During MDR-TB Treatment in the Philippines. PBSP, TDF, USAID
A well-thought enablers package has been put in place with the support of the GF grant to Philippines and includes both the incremental milestone awards to patients to improve retention and a transportation allowance to facilitate access to healthcare and alleviate sometimes prohibiting transportation costs. The transportation allowance was frequently referred to as being inflexible and insufficient, both by healthcare staff in direct contact with patients and patients themselves. The transportation costs incurred by the patients are highly variable, depend on the distance and mode of transportation. In places visited, based on the reports of the nurses and from a few reports by the patients, these costs were higher than the transportation allowance (even at its highest bracket). A feature that was considered problematic was that transportation allowance is provided on the reimbursement scheme and is not advanced. The main implementer of the GF grant that supports the enablers package, the NGO called Philippines Business for Social Progress (PBSP), is developing patient friendly and front-loaded schemes to provide transportation allowances and make them a truly “enabler” and not a partial reimbursement of the money spent by patients to access their daily dosage of treatment.

The most prominent problem of the PMDT is unusually high and increasing rate of loss to follow up. This problem is likely to be related to the rapid PMDT expansion with multiple factors that contribute to this phenomenon and those listed above (ADR and access to care) are the salient ones. While management of the ADR will be important to ensure retention on treatment and more training and expanded/revised range of ancillary medicines can help, decentralization of PMDT is the only other and perhaps even more effective measure to solve the problem of access to treatment and decrease the loss to follow up.

Previously, management of DR-TB was organized through the network of dedicated treatment facilities that were initially highly specialized in PMDT (as for example TDF at the beginning and the LCP later on). While this earlier organization model of the PMDT is still very visible, there are clear signs of a new strategy that will work through the current public health service delivery system, mainstreaming PMDT services in: a) provincial/city hospitals that cover the province with a population of around 1 million, b) district hospitals serving a cluster of municipalities with population of around 200,000, and c) selected DOTS health centers/RHUs (serving a municipality with population of around 50,000); and being rolled out in this particular order.

While this approach is absolutely logical and the achievements are particularly commendable already at this stage of the PMDT services expansion, a major drawback and apparent weakness of the expansion is also highly visible and is represented by the very high proportions of patients lost to follow up.

Table 18. DR-TB treatment outcomes in Philippines

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Success</td>
<td>64%</td>
<td>57%</td>
<td>59%</td>
<td>73%</td>
<td>73%</td>
<td>74%</td>
<td>63%</td>
<td>63%</td>
<td>64%</td>
<td>57%</td>
<td>46%</td>
<td>40%</td>
</tr>
<tr>
<td>Failure</td>
<td>18%</td>
<td>14%</td>
<td>7%</td>
<td>0%</td>
<td>4%</td>
<td>1%</td>
<td>2%</td>
<td>4%</td>
<td>1%</td>
<td>2%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Died</td>
<td>9%</td>
<td>15%</td>
<td>11%</td>
<td>5%</td>
<td>8%</td>
<td>12%</td>
<td>17%</td>
<td>11%</td>
<td>10%</td>
<td>9%</td>
<td>14%</td>
<td>13%</td>
</tr>
<tr>
<td>Lost to follow-up</td>
<td>9%</td>
<td>14%</td>
<td>23%</td>
<td>23%</td>
<td>15%</td>
<td>13%</td>
<td>18%</td>
<td>20%</td>
<td>25%</td>
<td>33%</td>
<td>38%</td>
<td>45%</td>
</tr>
</tbody>
</table>

If this phenomenon is not solved promptly and prior to the significant expansion programmed to take place in 2015-17 with stable and substantial support from the NFM GF grant, it will create unnecessarily elevated risk of even higher numbers of patients interrupting MDR-TB treatment with all related potential consequences of increasing mortality, DR-TB transmission in the communities and amplification of drug resistance patterns.

Recommendations
- Decentralization of PMDT and as early as possible during the course of treatment and further integration with the “basic DOTS” TB care may have a serious impact to reverse the high rates of loss
to follow up. This process has been piloted in several sites and can be expanded already in 2015. Wider expansion will require thorough planning and preparation by the NTP.

- With expansion and decentralization of PMDT it is important to expand training on management of ADR to the staff at decentralized treatment sites. Trainings will need to be planned to match wider expansion as mentioned in point 3.

- Changing enablers scheme into a front-loaded scheme, more flexibility and possible increase of the transportation allowances will be useful to influence the rate of loss to follow up while on treatment. This approach has been piloted and can be implemented in 2015.

- It is recommended to revise and expand list of available ancillary medicines for PMDT in 2015.

- It is recommended to boost interaction between healthcare workers and DR-TB patients, step up/improve health education activities to reduce number of patients diagnosed with DR-TB but not initiating treatment.

- Implementation of shorter regimens for DR-TB and introduction of new anti-TB drugs under appropriate conditions will contribute to the retention on treatment and may also improve treatment outcomes.
7.4. Data management

7.4.1. Conformity of the R&R parameters with WHO recommendations

The Philippines has largely adopted the new definitions and reporting framework of WHO (2013). The forms in use for recording and reporting (see Table 20 and Manual of Procedures 2013) largely provide for the new parameters recommended by WHO, with additional forms which the NTP uses for its specific purposes. The NTP plans to implement the revised DOTS registers from January 2015 across the nation. However, PMDT sites started to implement the new RR-/MDR-TB recording and reporting methodologies from 1 January 2014. However the training on revised PMDT forms in some regions was completed in later in the year (eg. October 2014 in Batangas) so that the PMDT registers were to be updated retrospectively. Training is focused on changes in recording and reporting definitions and forms; it is being conducted for both DOTS and PMDT. It is customised to the level of health worker for R&R and ITIS; 2 weeks’ training held on PMDT for doctors and nurses (one week training and one week “immersion” in a traineeship programme).

During the mission the registration was being performed according to these new requirements in the sites visited by Team B (LCP, Batangas, Grace Park STC, NTRL). The Presumptive TB masterlist is kept at the centres; it includes a column to distinguish those patients who are being evaluated for DR-TB (A special Presumptive DR-TB Masterlist for use in DR-TB centres (Form 1b) has been developed and is slightly different from Form 1 for all presumptive TB patients as in the 5th ed of the Manual of Procedures).

Laboratories servicing PMDT centres are expected to maintain one register, depending upon the diagnostic procedures that they undertake. Sites equipped with GeneXpert are expected to keep the NTP laboratory register (Microscopy and GeneXpert) while centres doing culture (as well as the DST centers) maintain the TB culture and DST laboratory register. Xpert facilities are expected to submit a monthly report. Training on the use of the revised registers and forms based on the updated MOP was held countrywide in October 2014 for the laboratory staff, supervisors and the regional medical technologist coordinators. However, compliance does at times vary and in at least one laboratory the workers were entering Xpert MTB/RIF results on a loose notebook even if the laboratory register had columns for results and the staff had received training in its use. This practice was laid down to problems with access of the laboratory register. Other challenges have been expressed concerning the R&R in the laboratories, namely a lack of approved policies and guidelines on laboratory recording and reporting; some facilities have one person doing the all laboratory activities and thus recording and reporting is delayed; a high turnover of trained medical technologists; the responsibilities of some regional coordinators and medical technologists go beyond the TB programme; some facilities lack computers and internet connection; inaccurate transcription of records to reports, particularly for the Registration Group and tallying the total number of cases tested to those with Xpert MTB/Rif results.

7.4.2. Definitions & Indicators for PMDT

The new registration system is governed by the NTP Manual of Procedures (MOP), the 5th edition of which has been revised in 2014 to incorporate updated definitions and parameters as recommended by WHO. The NTP has largely adopted the new WHO definitions although some terminology that the NTP is using differs from the ones of WHO, for example there is no category of patients with “unknown previous TB treatment history” (included in “other”), and Cat IV regimen is still used at times to refer to the second line MDR-TB regimen. The health care workers interviewed were generally aware of the new definitions. The new treatment failure definition for MDR-TB treatment was not known by one of the doctors in the clinics responsible for case registration.
The NTP report templates in paper and on ITIS were compared with the indicators and forms as recommended in the "Companion handbook to the WHO guidelines for the programmatic management of drug-resistant tuberculosis" Chapter 2 and the associated annexes.

7.4.2.1. Detection

To a large degree the “Quarterly Report on All DR-TB Cases” (3b) provides for the Detection indicators for RR-/MDR-TB; however, some important shortfalls are pointed out:

1. The total number of cases presenting to the DOTS facilities and who fit into a risk category for DR-TB are not included and juxtaposed next to the other values reported. The point of departure is the presumptive DR-TB patient who had a screening form completed. There may presumably be other cases - new or retreated - who were not screened and these would form a larger universe of cases to be used as denominators when assessing testing coverage.

2. The group “New” (Blocks A and B) could include patients who were tested without a manifest risk as well as others (eg, HIV infected, contacts of MDR-TB and delayed converters) who were targeted for DST.

3. In Block A, the Number of All Presumptive DR-TB Tested would include cases tested using different methodologies. There may be interest to split those tested with Xpert from those with other techniques.

4. The Interval between presumption of DR-TB and DST results is not included in the report. As a result of the shortfall in the Detection indicators noted at (1) the system is not able to inform about progress regarding the policy requirement that “all presumptive DR-TB shall be referred to the nearest DOTS facility with PMDT services for screening or an Xpert MTB/RIF site for testing” (see item L in MOP 2014 page 21). This is a direct consequence of the lack of linkage and/or synchronised entry of data on TB cases in both the PMDT and the DOTS components of ITIS. For example, in Batangas, there was no data entry on ITIS being undertaken at the DOTS clinic. In Grace Park PMDT satellite treatment centre, whereas the clinical management of PMDT has been integrated into DOTS since November 2011, the data management component has not and data are entered offsite at the city TB health office. The PMDT staff do not have access to the ITIS records for their own DOTS patients.

At the NTRL, the quarterly reports on GeneXpert laboratory examinations (1a), DST (1c) and LPA (1d) provide a similar breakdown of the cases tested by new, relapse and Other retreatment. If the same case is tested using different methodologies then there is no possibility to tell them apart and therefore repeat counting of the case would occur.

7.4.2.2. Enrolment

The “Quarterly Report on All DR-TB Cases” (3b) also provides the number of RR-/MDR-TB and XDR-TB (presumptive or otherwise) entered in the DR-TB register for 2nd line treatment. A sex and age-group disaggregation is included. The only salient differences from the WHO recommended indicators is that:

- the number of children and female patients detected is not juxtaposed against the number of those registered;
- the interval between DST result and start of treatment is not summarized for the patients with data.

As to the first observation it would be possible to have at least the Number of All Presumptive DR-TB and the Number of All Confirmed RR-TB from report 3b featuring alongside the numbers registered for treatment, in order to allow a ratio of detected to enrolled during the quarter of interest to be computed. The second indicator could easily be derived from the ITIS given that both the time points (Start Treatment Date and Release date) are entered on the Case management panel of ITIS.
7.4.2.3. Interim results

The “Quarterly Report on Treatment Interim Outcome of DR-TB Cases” (5b) overall conforms to the one recommended by WHO. To note that WHO recommends that the analysis of Interim results and Final outcomes (see next) is only performed on laboratory confirmed cases of RR-/MDR-/XDR-TB, in order to allow meaningful comparison between the groups. The only elements which are missing are the numbers of cases (i) started on second-line treatment found not to have RR- or MDR-TB and (ii) on XDR-TB treatment found not to have XDR-TB during the quarter of interest. These two indicators are meant to capture the degree of unnecessary treatment. This was observed to be more frequent when GeneXpert testing was not available (e.g. at the San Jose Rodriguez Memorial Hospital in Caloocan City one third of patients in the 2011 MDR-TB cohort were found not to be RR-TB into their treatment). It would thus be useful to monitor these indicators in units where many patients are started on MDR-TB treatment on presumption of DR-TB and short of a reliable laboratory diagnosis.

7.4.2.4. Final outcomes

The “Annual Report on the Treatment Outcome of DR-TB Cases” (5c) contains all the elements required for outcome reporting as per WHO recommendations. As noted above, only laboratory-confirmed RR-/MDR-/XDR-TB cases are included for the generation of these indicators. In situations where HIV-associated TB is common, a separate cohort for patients with HIV/RR-TB is suggested. The category “Still ongoing” would need to be merged with the “Not evaluated” for standardised reporting to WHO. It was observed that this category was often used owing to delayed update of data rather than true persistence of treatment beyond 24 months.

7.4.2.5. ADR reporting

The experience of the NTP in reporting of adverse drug reactions is largely motivated by the monthly returns that the PMDT treatment facility staff have to complete for the purposes of calculating the consumption of second-line and ancillary medicines and forecasting the drug requirements. The data source for this reporting comes from the patient treatment card. There is no systematic transfer of information about ADRs from the NTP to the official structure responsible for pharmacovigilance (i.e. the Pharmacovigilance Unit of the Center for Drug Regulation and Research at the Food and Drug Administration (FDA) of the Philippines). Nonetheless, the FDA of the Philippines has a prominent Internet presence and also promotes the online spontaneous reporting of suspected ADRs through an SSL (see https://www.fda.gov.ph/sysFDA_WorkFlow/en/classic/63866899151ef25b75f7f59042808866/ADR_Form.php; see form below; accessed 22 Nov 2014). The FDA has participated in the WHO Programme for International Drug Monitoring since 1995. Since then and by August 2014 the country had reported more than 700 reports linked to first or second anti-TB drugs (unpublished information; VigiBase).

Within the Case Holding panels of ITIS is an ADR module which allows for the entry of more than one report per patient (see above). There are no standardized reports for ADR, nor criteria for filtering patients who have had an ADR reported within the Advanced search function of the Case management view. The generation of indicators of drug-related harms are not possible without exporting the data in case based format and running an ad hoc analysis. There was no discussion yet between the NTP and National PV Centre about the potential for ITIS to provide an extraction of case reports with suspected or confirmed ADRs into a format which satisfies the national requirements of ADR notification.

The mission was informed by MSH/SIAPS (M. Gabra) that in their workplan USAID had approved to hire a full-time epidemiologist position from the start of 2015 to work closely with the FDA and the PMDT staff on the strengthening of national pharmacovigilance capacity. Additional external, expert support is also expected in January 2015 to improve local capacity in causality assessment and signal detection. This was timely because of the imminent introduction in the Philippines of shorter regimens in early 2015 and the start of use of bedaquiline later that year. It is understood also that

Page | 34
another person will be recruited by the NTP and will be located in the FDA to provide a liaison function. An ad hoc advisory group between the DoH and the FDA will be nominated in December 2014 and SIAPS will be on this group.

Figure 7-3. Online form for reporting of suspected ADRs (The Philippines FDA)
Figure 7-4. Module for reporting ADRs (left) and criteria for filtering records (right), IT IS

7.4.3. The functionality of the electronic system for drug-resistant TB patients

The Integrated Tuberculosis Information System (ITIS; http://itis.doh.gov.ph/home.php) is a web-based system for data collection, management, and reporting. It was developed by the Knowledge Management and Information Technology Services (KMITS) in coordination with Disease Prevention and Control Bureau – Infectious Diseases for Prevention and Control Division (DPCB-IDPCD) of the Department of Health of the Philippines. ITIS is intended to provide the users with the TB information required for TB control. In addition to DR-TB, it includes modules with other focus (Drug-Susceptible TB, TB in Children, TB in Prisons and TB/HIV). Moreover, it is envisaged that ITIS will interoperate with other data sources for the purposes of consumable stock management (National Online Stock Inventory System (NOSIRS)) and clinical data management (Integrated Clinic System (iClinicSys). None of these links are functional at this point in time. The DoH was mindful of the Enterprise Architecture when creating the system (conformity of ITIS with the requirements of this architecture was beyond the scope of the mission).

Figure 7-5. Schematic representation of the relationship between ITIS and other information sources
7.4.3.1. Data entry

Data entry on ITIS requires that the user logs in and enters the patient record online. The main data sources at the time of entry are the (i) screening form, (ii) the TB treatment card and (iii) the Laboratory Request form and associated results forms (culture, DST results). The BMU and laboratory registers were not actually seen or reported being used to enter the data at the clinics visited. ITIS was originally envisioned as a monitoring tool where separate encoders would digitize the paper records of facilities. This objective is innovative and commendable, but ambitious and has proved difficult to implement. Indeed, during the mission, it was observed that the encoding was being done by the health workers themselves following the entry of data on paper forms (a number of those interviewed performed their “ITIS duties” after they finish seeing patients, or in the weekends, or at home). Parallel coding - on paper and electronic - is thus currently the rule where ITIS is used. This creates a double recording requirement for health workers. In addition to monitoring of patient indicators the system has created expectations for work management (e.g., looking up of patient clinical markers and laboratory results or interaction with other systems for management of consumables). There is a possibility to use ITIS offline. This requires the user to download an executable file, run it, create a local database on the terminal and then upload the database (as a .doh file). The upload only updates the later record so any changes made in the interim in the online version will not be written over.

7.4.3.2. Coverage & Completeness

If things go to plan, ITIS will eventually cover all DOTS and PMDT facilities at full implementation. The system has been conceived in order that patient eligibility for first entry starts upon presumption of TB. At the time of the mission there were over 412,000 patient records entered on ITIS. Since it was launched in 2012, RR-/MDR-TB cases have now been entered from 15 of 17 regions (as well as DOTS patients from 6 regions). The Table below summarises the number of cases entered for both DR-TB and DOTS centres for the period January 2010 till 10 December 2010.

Table 19. Registered TB and RR-/MDR-TB cases by Region, Philippines (as on 10.12.2014)

<table>
<thead>
<tr>
<th>Region</th>
<th>DOTS TB Cases</th>
<th>RR-/MDR-TB cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>BICOL REGION (Region V)</td>
<td>393</td>
<td></td>
</tr>
<tr>
<td>CAGAYAN VALLEY (Region II)</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>CALABARZON (Region IV-A)</td>
<td>802</td>
<td></td>
</tr>
<tr>
<td>CARAGA</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>CENTRAL LUZON (Region III)</td>
<td>57980</td>
<td>1</td>
</tr>
<tr>
<td>CENTRAL VISAYAS (Region VII)</td>
<td>99</td>
<td></td>
</tr>
<tr>
<td>CORDILLERA ADMINISTRATIVE REGION (CAR)</td>
<td>56</td>
<td></td>
</tr>
<tr>
<td>DAVAO REGION (Region XI)</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>EASTERN VISAYAS (Region VIII)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>ILOCOS REGION (Region I)</td>
<td>7916</td>
<td>454</td>
</tr>
<tr>
<td>MIMAROPA (Region IV-B)</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>NATIONAL CAPITAL REGION (NCR)</td>
<td>109957</td>
<td>4587</td>
</tr>
<tr>
<td>NORTHERN MINDANAO (Region X)</td>
<td>5585</td>
<td>304</td>
</tr>
<tr>
<td>SOCCSKSARGEN (Region XII)</td>
<td>1872</td>
<td>82</td>
</tr>
<tr>
<td>WESTERN VISAYAS (Region VI)</td>
<td>39707</td>
<td>150</td>
</tr>
<tr>
<td>ZAMBOANGA PENINSULA (Region IX)</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>223017</strong></td>
<td><strong>7263</strong></td>
</tr>
</tbody>
</table>
To note that the total number of records on the system is however much higher (412,810) and includes other presumptive DR-TB patients who were not confirmed by the laboratory and patient records from before 2010.

At the time of the mission the DOTS centers in Region 6 were not observed to be entering data. In two sites visited in the national capital DOTS data were being entered but this was performed by the city health officials off-site. In Caloocan City (NCR), this data entry was performed by the city health officials off-site. This work practice has implications upon the ownership and responsibility for the data and the possibilities for checking the accuracy and completeness of the data entered.

The coverage of data for PMDT varied by treatment facility visited. For instance at LCP the 2014 records for all PMDT patients and DR-TB suspects were complete on ITIS, even those coming from another unit. At the San Jose Rodriguez Memorial Hospital in Caloocan City the 2014 data were up-to-date until the previous week. At Batangas, however, only 5% of patients screened and 12% of those enrolled on MDR-TB treatment were on ITIS.

Even in centres where the coverage of record entry on PMDT patients is good or nearly complete, some variables may not be completely entered (e.g., the record of daily administration of treatment).

7.4.3.3. Access

Access to ITIS was reported to be problematic in most places visited due to poor internet connection or to issues with the ITIS site itself. In the Lung Center of the Philippines (LCP), there was no network connection at the time of the visit. This is reportedly often the case, even if nurses are expected to enter their data within 24 hours. PCs are used and are available but not in the clinic sites; access through laptop could be convenient but is not available at this stage. An initial registration takes about 15-20 minutes. In Grace Park Health Center PMDT data are entered every afternoon via a desktop (laptops and tablet computers found to be more cumbersome). Lack of internet has caused this routine to be disturbed for days on end in the past. Internet connection is the main rate limiting factor; at times they have problems logging onto the system. It takes about 45 minutes to update the data for one PMDT patient already on the system.

In contrast, in the Batangas TC the system could be accessed easily; WIFI was available in different sites in the facility and there are multiple sites from where to enter the data. The system speed was good. DOTS patient data are not entered in the onsite DOTS center. Data entry is usually organised on Thursday (weekly update; sometimes on Saturday or in their spare time).

7.4.3.4. Robustness

No reports were made by end-users of data being corrupted or altered after entry.

7.4.3.5. Server/Internet

The ITIS server is hosted at the DoH. Backups of the data are made daily onto a portable hard-disk held by the TB database administrator in a different physical location in Manila. Speed is slow and the server may be inaccessible as connection depends on one ISP. KMITS is trying to get a second ISP as a backup so that if internet access is down on the primary provider they can fall back on the second. Moreover, the current server is now more than 5 years old and due for replacement. The replacement server is also envisaged to enhance the access via android devices, android being the dominant OS for smartphones/tablets in use in the country.

7.4.3.6. Coordination structure

It is envisaged that ITIS will work within a network of other data systems with which it will interoperate (see schema above). At this point in time none of these structures are effectively interoperating. The DoH remains committed to the roll out of both the DOTS and PMDT components of ITIS. The Global Fund support will continue until 2017; the new grant will provide for training, internet support, and some hardware but no more software support or maintenance of the
software, which will need to be provided for from domestic resources. KMITS is the official structure of the DoH which is dealing with data management for all diseases. It is composed of 5 staff: 2 developers, 1 database and server administrator; 1 training officer and 1 project officer. It belongs to a different cluster from the NTP (at the regional level there is also a similar division). Implementation of ITIS is overseen by the NTP and its regional structure. In provinces and rural health units it is usually the same person dealing with both the monitoring and the encoding. An online self-teaching module is available for users (new/refresher). ITIS has a transaction log function which allows assessment of activity by different users (see below), a useful management and quality assurance tool.

Figure 7-6. Module for the trail of use activity, IT IS

<table>
<thead>
<tr>
<th>Date</th>
<th>Script</th>
<th>User</th>
<th>Action</th>
<th>Field</th>
<th>Old Value</th>
<th>New Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-01-2014</td>
<td>login.php</td>
<td></td>
<td>login</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-02-2014</td>
<td>patientAdd.php</td>
<td>A44</td>
<td>patientID</td>
<td>1809888000104200880</td>
<td>1809888000004200880</td>
<td></td>
</tr>
<tr>
<td>12-03-2014</td>
<td>patientAdd.php</td>
<td>A44</td>
<td>standardID</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-04-2014</td>
<td>patientAdd.php</td>
<td>A44</td>
<td>birthdate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-05-2014</td>
<td>patientAdd.php</td>
<td>A44</td>
<td>lastName</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-06-2014</td>
<td>patientAdd.php</td>
<td>A44</td>
<td>gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-07-2014</td>
<td>patientAdd.php</td>
<td>A44</td>
<td>birthPlace</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-08-2014</td>
<td>patientAdd.php</td>
<td>A44</td>
<td>bloodType</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-09-2014</td>
<td>patientAdd.php</td>
<td>A44</td>
<td>bloodType</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-10-2014</td>
<td>patientAdd.php</td>
<td>A44</td>
<td>bloodType</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-11-2014</td>
<td>patientAdd.php</td>
<td>A44</td>
<td>email</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-12-2014</td>
<td>patientAdd.php</td>
<td>A44</td>
<td>religion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-13-2014</td>
<td>patientAdd.php</td>
<td>A44</td>
<td>occupation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-14-2014</td>
<td>patientAdd.php</td>
<td>A44</td>
<td>address</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-15-2014</td>
<td>patientAdd.php</td>
<td>A44</td>
<td>location</td>
<td>06154857</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-16-2014</td>
<td>patientAdd.php</td>
<td>A44</td>
<td>zipCode</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-17-2014</td>
<td>patientAdd.php</td>
<td>A44</td>
<td>birthPlace</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-18-2014</td>
<td>patientAdd.php</td>
<td>A44</td>
<td>birthPlace</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A national consultative meeting is held quarterly and lasts for about 3 days. All regions participate, as well as Global Fund, WHO, USAID, and SIAPS (ADRs, logistics). At this meeting the system performance and development are discussed. Local governments and end-users are not represented at the national consultative meetings; any problems and feedback are captured during supervision visits. Similar meetings are held at the regional level. Monthly monitoring meetings are held at the facility level; at LCP these meetings were reported to discuss progress but no standard monitoring indicators are generated from ITIS and discussed.
7.4.3.7. Case management

The ITIS is not being used as an electronic medical records system (EMR) because the updates are not frequent enough to enable real-time access and an online connection could not be relied upon in all settings where individual patient case notes would needed to be consulted. If ever this component is developed it would provide clear benefits, creating efficiencies, for instance to trace if and when a patient has been screened or find details of a patient being referred from elsewhere without relying on having a paper record everywhere the patient turns up. This is particularly relevant in TCs such as the one in Batangas where patients are often referred from outside the region and from remote islands. EMRs also provide other organizational benefits (eg overcoming problems to interpret calligraphy; having important records on reasons for changing of treatment or ADRs recorded in a specific location). Apart from issues relating to access, protecting patient confidentiality and the added task to enter certain information (eg daily treatment records) are important considerations.

7.4.3.8. Drug management

There is no clear plan at national level on how to use the information on daily doses of medication currently being entered on ITIS for individual patients in TCs such as the Batangas. If this information will be used in future to feed into the forecast or drug-ordering calculations it is not happening right now. The centres are still providing additional monthly line-listing of patient consumption to inform the calculations for SLD and ancillary drugs. This information is also used at national level in order to adjust for fluctuations in consumption patterns of SLDs (as additional information to QuanTB) resulting from patient loss to follow-up, death, and changes of dose.

7.4.3.9. Reporting

The reports generated by ITIS are modelled on the paper ones (see above). The same compliance levels to the revised framework of WHO in 2013 thus apply. So for instance the reports on screening do not feature the total number of target groups who present for TB care and need to be tested (this information could be available on the system if all the DOTS and PMDT centres enter the data on ITIS and thus all TB patients presenting to the DOTS centre with a risk factor for DR-TB registered). The online reports however allow greater flexibility on certain parameters than the paper reports (eg; they allow stratification by exact time periods rather than quarterly / annually only; distribution of cases by particular region/province/municipality; see below).
Despite this flexibility and the obvious advantages of electronic reporting, the centres visited are not yet using the ITIS reports for official reporting. The two reasons cited were either because of incomplete update of the PMDT centre patient data or, at times, that the numbers generated in the system and those computed manually differ even when updates were done (one example from Dr. Jose N. Reyes Memorial Medical Hospital shown below). In one instance the discrepancy was traced to a change in the definitions applied from mid-2014, whereby prior to that date all retreatment cases without bacteriological confirmation were classified as “Other” and thence such cases have been reclassified into the subcategories of previously treated (“Relapse”, “Retreatment after failure”, etc).

Figure 7-8. Query screen for report generator(treatment interim outcomes, DR-TB), ITIS

7.4.3.10. Data export function

A data export function to .csv is possible at central level but not at the treatment facility level. The function to export aggregated tables from the reports as Excel sheets is available at the TCs. This function could be useful in the centres to analyse the data or to assist in work management (eg, generate a list of patients under evaluation awaiting results).
As described above, recording and reporting is currently a mix of the mainstay paper-based forms and registers - now using stationery largely compliant with the WHO-recommended framework of of 2013 - and computer-based formats (ITIS online database and Excel sheets, as well as ACCESS in the laboratories). In both the treatment facilities and the laboratories there is often a repetitive process of registration in both formats. There are also parallel chains of reporting within the laboratory and treatment centre networks with no cross linkage of data. Much of the analysis and validation is thus only possible at a central level, which limits the completeness of cross-checks which can be made and de-duplication of records. Some DOTS centres (e.g. San Jose) and city health offices are encoding data on susceptible TB cases who are started on treatment but not for presumptive TB patients. In no place could the full trajectory of a TB patient be followed through on ITIS, i.e starting with the presumptive TB patient at a DOTS facility, followed by an update from the laboratory confirming the case as TB, then involving the PMDT centre if the patient has a DR-TB risk, and eventually registering an MDR-TB patient on treatment.

### 7.4.4.1. **Uniqueness**

One of the problems of trying to reconcile numbers only at the central level is that it becomes difficult to enumerate the totality of TB cases eligible for MDR-TB treatment accurately. This is compounded by the decentralization of diagnostic facilities as is currently the situation in the Philippines where over 70 GeneXpert units have been distributed and more will be commissioned in the near future. There are clear issues with the national statistics concerning the double counting of RR-TB cases who were later found to be MDR-TB when tested using DST in the NTRL and the two other DST labs in the country. There is a plan to assign a unique number based on patient name, gender and date of birth via PhilHealth but this is not yet in use. The lack of widely-used patient
unique codes (e.g., ID card or social security number) make it difficult to identify individual patients efficiently on the system, without recourse to more laborious matching.

7.4.4.2. Timeliness

In centres that update ITIS the staff usually do this at a weekly or more frequent rhythm. However, the more remote PMDT patient data from 2010 and earlier (or even later) may not be entered yet. An attempt was made to compute, using ITIS, the two intervals proposed by WHO in the PMDT indicators (see the Companion handbook Chapter 2 and associated annexes), namely:

- **Detection indicator 5**: Interval between presumption of RR-/MDR-TB and DST results; and
- **Enrolment indicator 4**: Interval between RR-/MDR-TB diagnosis and start of MDR-TB treatment.

For the Detection indicator, the time between suspicion of DR-TB and availability of DST results could not be computed because the date of suspicion is not routinely captured on the same system. Depending upon the type of patient risk category, this date may correspond variably to when the 5th month smear resulted positive, or the date of discovery of significant contact with a MDR-TB case, or an HIV positive test result. Currently ITIS reports are not set to generate the turnaround time from a request for DST or Xpert MTB/RIF to the release of results. The interval between sample collection and the release of results can however be derived given that both dates are captured on the system. This would require an analysis of the raw case-based records. In the absence of the online function the TB Laboratory Result Releasing Forms and the Laboratory Specimen Receiving Forms (which bear the test request date) at Grace Park Health Center were examined for November 2014 to assess the turnaround for GeneXpert results. The interval between sample collection and release of result was typically 1-2 days, but the time from processing to the arrival of the result at the centre was often 6-8 days. This is surprising given the fact that the GeneXpert facility is located only about one hour’s drive away. It transpired that a delay was incurred in compiling the individual sample requests and results slips, getting them signed and having them transported over. These delays could be reduced if the GeneXpert site could communicate the results electronically immediately upon production (e.g., to a central server +/- SMS).

The Enrolment indicator could more easily be derived because both the diagnosis (release date) and date of start of treatment are captured on ITIS. However, there is no inbuilt function at this point in time to generate this automatically in the form recommended by WHO (i.e., 6-monthly mean, minimum, maximum and number of records assessed). It would therefore require analysis of the raw records. However, enrolment delays - as well as the reasons for why some diagnosed patients were not started on treatment - were being monitored by some clinics. For instance in LCP, the average duration from screening (i.e., TB patient examination/testing for DR-TB) to start of treatment among the 313 patients diagnosed with RR-TB in 2013 was reported to be 39 days and in the 190 patients of Q1-Q3 2014 it was reduced to 24 days. At Dr. Jose N. Rodriguez Memorial Hospital, out of the 100 RR-TB patients confirmed on Xpert in 2013, 83 were started on treatment, 79 had information on the dates, and the mean delay was 14 days (median 7 days) with a range of 0-161 days.

7.4.4.3. Validity, consistency and accuracy

One of the important quality issues of an information system is that the data are valid and that there are no mistakes resulting usually from transcription errors or lack of updating. The standard way of checking this is to take a sample of paper records used as the data source and check them against the data entered electronically for individual testing or treatment episodes. While no discrepancies were noted between the two sources of information during the mission the checking was not systematic or of sufficient spread over location and over time to ensure a satisfactory conclusion. This is a dimension which needs to be stressed on during supervision visits. Accuracy relates more to how much the data on the system reflect the reality. One of the most consequential observations during the mission was that a substantial proportion of retreatment TB cases detected clinically and
included in the official notifications of the country were found not to be confirmed TB when they were tested using Xpert.

In TB surveillance and monitoring, the validity, consistency and accuracy of data hinge very much on the laboratory input. In the Philippines the three DST laboratories (NTRL, Cebu and LCP) store and manage their data on unlinked MS Excel (Cebu) or ACCESS files (NTRL and LCP). There is therefore no automated control of the consistency of the results between these centres; the NTRL visits the other two DST labs at least once yearly and each DST is reportedly validated by comparing spreadsheets from the different labs on a case by case level. The NTRL compiles the quarterly paper reports from the regions, enters them in Excel sheets and uses these aggregations to generate its national indicators. There are no case-based data at the NTRL level and it is therefore not possible to distinguish duplicates or cases with RR-TB who were subsequently confirmed to be MDR-TB. Otherwise there are no concordance indicators being generated for the routine cross-checking of smear microscopy with Xpert results, neither for sputum smear positive or smear negative cases. The proportion of patients with presumptive pulmonary TB who are positive on direct sputum smear microscopy is used to assess the quality of testing and case detection (using 10-20% as rough guidance of expected yield).

A laboratory module of ITIS is being planned for use to manage the laboratory data. “Workbooks” will be generated as a result of laboratory requests from health facilities and the results will be entered in the workbooks and reports eventually generated. A laboratory process flow has been worked out and will be discussed with NTRL in early December and the plan is to have it piloted in one or more labs by the first quarter of 2015.

7.4.5. Recommended action points for data management

7.4.5.1. Case registration

1. An attempt should be made to register on ITIS all TB cases diagnosed by the programme. This would require that for each individual TB case diagnosed clinically or bacteriologically a minimum dataset is captured, including identifiers, demographic and clinical data (including in particular details on the TB treatment history and any other risks for DR-TB as indicated in the national policy). The upper block of the Case Management module of ITIS could be used and adapted slightly for this purpose (the addition of the “Bacteriology confirmation” and “Outcome”, and their respective dates, would be useful to have in this module, albeit this would require one or more updates to the record on the system in order to complete the data subsequent to the initial registration). Other patient details would only be entered if the case is a presumptive or confirmed RR-/MDR-TB case and based on need (for instance if the system will be used as an EMR for clinical case management or detailed drug forecasting).

In terms of volumes this would mean that upon full implementation all the 244,000 TB cases diagnosed in the country in 2013 would have their basic details registered on ITIS. For this to be done adequately more centers and laboratories would need to be provided with access and most likely the interfaces used to enter and access diversified (e.g., greater use of mobile electronic devices (smartphones, tablet computers or laptops); bar-code readers; optical mark recognition software), in order to capture the basic case data more extensively. The possibility to provide for offline data storage and periodic synchronization of the data with the server would have clear advantages. Development of apps and provision of mobiles and tablets to health professionals could be one option; other workers may also be inclined to use their own hardware for work-related activities should they see a clear benefit to be gained.

As an interim (standby) solution for centres that cannot register case-based data (due to the constraints identified earlier) there could be an option for them to record and report aggregated
information via tabulations each quarter and this would bring ITIS data - case-based or aggregated – closer to becoming the official data source for TB cases, drug susceptible or resistant. The necessary changes would need to be applied to ITIS so that it accommodates an aggregated function alongside the case-based data (as well as the SOPs relating to this).

2. One other consideration would be to aim to include all presumptive TB patients on the ITIS in addition to the clinically-diagnosed and bacteriologically-confirmed cases. This prospect appears not too distant from the way in which ITIS was conceived, with data entry for patients being evaluated for TB at the time of suspicion (i.e; when the information of a laboratory request form is provided to the laboratory). The advantage would be that the records on the Master Lists could be generated from ITIS and “positivity rates” could be compared easily between centers and different subgroups of patients. The downside is the volume of individual records which would represent a substantial additional load for the data entry operation and storage on the server (an increase by a factor of 10 or more compared to current records for confirmed TB patients may be expected). On the other hand the dataset captured for presumptive patients could be kept smaller than the one for confirmed TB cases.

3. Another clear priority is the creation and introduction of a specific laboratory module, starting with the three laboratories that undertake DST in the country and which have developed their own Excel or Access-based records quite independently of each other. The laboratory is crucial for the diagnosis of TB and DR-TB and eventually all centers equipped with Xpert or LPA should be linked up to the network. Getting the laboratories to register the susceptibility test results online is expected to cut down on turnaround time and provide the labs in return with a method to generate their own activity reports. It would also, conceivably, avert the repeat counting of the same individual with a molecular test showing RR-TB from being enumerated again should a biological specimen be confirmed by conventional DST, as was observed at NTRL. Automating the transmission of results from GeneXpert instrument to a centralized server could further cut-down on any delays/errors due to the need for workers to trace a patient registration online and enter the corresponding results manually. When the choice of laboratory for the pilot is made, it would be important to make a strategic choice of a laboratory which would allow the testing of a complete pathway (DOTS center<->laboratory->PMDT center)

4. An inventory module for drugs/consumables is another priority: at this point in time the data on drug consumption for PMDT patients is at times being entered once in ITIS and again at the end of the month in a separate Excel-file which computes the consumption patterns per patient. According to the current plan implementing this component would require close collaboration with the other DOH staff dealing with NOSIRS who are not within the NTP or KMITS structures.

5. The recording of adverse drug reactions would need to allow for (i) active pharmacovigilance data for patients being treated with new or repurposed drugs and novel regimens; and (ii) the reporting of a minimum set of data for all ADRs reported by patients on MDR-TB treatment. For the first situation, modules for cohort event monitoring (CEM) will be introduced alongside the initiation of patients on shorter regimens and bedaquiline from 2015. These will need to conform to the relevant WHO guidance on this area (see References). For the second situation, the recording can be limited initially to all severe or serious events reported by the patients or detected in the course of clinical and laboratory examinations (e.g., jaundice or anaemia). These practices may need to be modified depending on the experience in pharmacovigilance in MDR-TB patients and based on the requirements to report to the FDA of the Philippines (and VigiFlow; see also below)

7.4.5.2 Case reporting

1. There needs to be a progressive replacement of the paper-based system with electronic elements as ITIS implementation moves ahead. A timeline for this process needs to be developed,
advancing in a phased, negotiated manner at the pace of the automation of data and as the information is validated for completeness and accuracy. So, for instance,

- if a centre enters the minimum data on all confirmed TB cases then the staff is absolved of the requirement to maintain the Master Lists (“suspects” registers), or generate the “Quarterly report on TB case registration” or even to keep a BMU TB register;
- if the laboratory can link up to the patient medical record then the requests for analysis of biological specimens can also be automated and there is no need to await for the results to be provided on the paper forms before acting upon them and/or informing the patients. Likewise the laboratory staff will not need to produce aggregated quarterly reports (eg Report 1a) and can also produce additional indicators (particularly to check sputum smear with Xpert results);
- if all patient data usually entered on the second-line treatment register are entered on ITIS then the need to have the register and to generate manually the Enrolment, Interim results and Final outcome indicators for RR-/MDR-TB are obviated;
- if further information on daily, individual patient consumption of SLDs is up to date then there should be no need for the units to recreate manually the same information in patient line listing at the end of the month (at this point it is not convincingly clear to the end user and at central level why individual data on daily treatment administration is being entered on ITIS).

This process can proceed up to the point where the only remaining paperwork is the one completed at the point of patient interaction (treatment card, screening form). This is likely to be the last remnant of the system to disappear. Its successful implementation will depend upon the user confidence on the system being able to provide the complete clinical information reliably and consistently (usage would now have moved to an electronic medical record; EMR). If the system is to evolve to the level where data entry at the point of patient interaction is electronic, then greater mobility needs to be ensured given that desktop computers may not be accessible during the patient encounter. One way of improving access to authorized users could be through “apps” developed for mobile devices (tablets and/or smart phones).

2. In order to be in conformity with the WHO minimum requirements for PMDT reporting it is important that early attention is given to fix the problems in generating the Detection set (coverage of R-resistance testing by risk category, accurate enumeration of cases eligible for MDR-TB treatment and estimation of interval between presumption and test results). Moreover, the “bugs” detected in reports as a result of the introduction of changes to the case definitions during 2014 need to be fixed.

3. Entry of minimum data for all TB cases (see first recommendation under Case registration section above) would serve, among others, to ensure completeness of the notification of TB. Even if this is not a statutory legal requirement in the Philippines, it could help satisfy the need for reporting of TB cases among the other communicable conditions which the DoH collects information about.

4. Agreement with the national pharmacovigilance center (FDA) of the Philippines and partners is needed concerning the method of reporting of ADRs. The intention would be that for any episode of drug-related harm (severe or otherwise; and elicited spontaneously or through active methods) the data will be exported directly from ITIS to the PV database maintained by the FDA without the need to have a worker intervene.

5. A lot of data are being collected on ITIS. It is time to start planning analyses beyond the mainstay indicators envisaged by the standard reports. For instance, the data can now start to shed light on critical operational problems, such as the timing from start of treatment when deaths and loss to follow occur: this could be analyzed for different patient groups (eg by region or patient type or age-group).
7.4.5.3. **System functionalities**

1. **Access rights** need to allow better **linkage between the DOTS and PMDT** components of the database. The DOTS workers need to know which of their presumptive MDR-TB patients were confirmed and enrolled on second-line treatment in order to discharge them correctly on the BMU register or else assign them an outcome. Likewise the PMDT workers need to have a more efficient way of knowing about the patients undergoing testing and confirmed or presumed as MDR-TB in order to follow them up.

2. The assignment of **unique identifiers** could help trace patients fast and reliably within the system. As it is right now a patient is searched using the name and then matched using other identifiers and demographic details, given that identity or social security numbers are not an option. The use of the registration number on ITIS would be limited to one particular episode of care.

3. **A batch-upload onto ITIS** of the PMDT data from 2013 and earlier (which is already stored on Excel sheets) should be attempted. This will require mapping of the data to the ITIS structure; if done successfully it could save a huge chore for the workers in the facilities. The rationale for doing this is to centralize as much data as possible in one place, in a uniform structure. It will require negotiation with all the previous producers/owners of the data.

4. The **safeguarding of the data** is key. Server replacement appears to be imminent; the provisions for backing up the data automatically to a site physically remote from the main database is important. Likewise it is important that Internet access to the ITIS server is reliable and that a backup the current internet provision is introduced to address this other reported problem.

5. The **infrastructural needs** for ITIS have to be attended to. One of the common limitations reported by the users in the clinics was the intermittency of internet provision at their end. The solution to this problem lies clearly with the access in the individual treatment and diagnostic sites (rather than ITIS) but it could be alleviated if functionalities such as offline data entry are established.

6. The **parallel system** of PMDT data flow in the country - from the laboratory and the treatment centre networks - could provide an opportunity for cross-checking of data between the diagnostic and curative sectors. However, at this point, this appears to happen only at the central level at the end of the chain. By then it becomes difficult to reconcile the numbers and make sure that there is a good agreement between the two sources. It is therefore recommended that checks are undertaken systematically and periodically more peripherally. Such checks would no longer be necessary once ITIS is fully rolled out countrywide.

7.4.5.4. **Coordination and resources**

1. The **coordination structure** and quarterly meetings which govern the functioning and roll-out of ITIS include the participation of key partners involved. However there appears to be a lack of direct representation from the peripheral workers who are interacting with ITIS on a daily level. In fact ITIS does not have an inbuilt mechanism for users to report “bugs” or suggest added features, short of which such reports can only reach the central level indirectly through additional steps.

2. The establishment of **technical and advisory group for ADR** monitoring between DoH and FDA to define the methodology of pharmacovigilance is timely given the important developments in PMDT expected from 2015. This group will have important significance for defining what ITIS and its users need to have and do in order to ensure that the indicators for PV are correctly generated, that signal detection is carried out and about the transfer of adverse event data to FDA.

3. Online training modules for users of ITIS could be expanded and other **eLearning** tools for data managers and M&E experts would be encouraged. There is a commendable trend in the DoH and NTRL to give normative documents a pedagogical slant. The Philippines has in the past been a pioneer in the field of PMDT training modules. It would therefore be useful if the content from...
material already developed, tried and tested be used adopted for online platforms and benefit from the greater flexibility that these offer (eg; allow self-testing; deal with staff turnover).

4. An **evaluation date** of ITIS should be planned from now and terms of reference/parameters drawn up. The exercise should broadly aim to assess how well the system performed against its objectives and the timeline envisaged for implementation. The opportunities and downsides would need to be evaluated constructively with a view to its long-term sustainability once all external funding stops. The degree by which the individual partners benefited from the system (eg flexibility and reliability reporting requirements to Global Fund; critical assessment for “validation” points). Other indicators have been proposed by WHO (see Table 21; reproduced from Table 4.1 (page 74) of http://whqlibdoc.who.int/publications/2012/9789241564465_eng.pdf) and a selection of these could be monitored centrally and adapted as ITIS moves forward.
Table 20. Main forms for recording and reporting, NTP Philippines, 2014 (those additional to ones recommended by WHO in 2013 are in italics)

- Presumptive TB masterlist
- Informed Consent and Commitment to Undergo Treatment for Drug-resistant TB
- Contract for the patient to be treated for drug-resistant TB (DR-TB)
- NTP laboratory request form
- NTP laboratory register (microscopy and Xpert)
- TB culture and DST laboratory register
- Quarterly report on TB microscopy, Xpert, culture, DST, LPA and EQA for TB microscopy
- Quarterly report on all DR-TB cases
- Quarterly report on treatment interim outcomes of DR-TB cases
- Annual report on the treatment outcomes of DR-TB cases
- Drug-resistant TB register
- NTP PMDT referral form
- DR-TB screening form
- PMDT Consiliumex
- PMDT Treatment card
- PMDT Contact initial investigation form
- PMDT Patient’s progress report form
- PMDT Patient’s booklet
- PMDT Patient endorsement form
- PMDT Treatment site requisition form
- PMDT Drugs receiving form
- PMDT Stock card
- PMDT temperature and humidity monitoring log
Table 21. Possible indicators for monitoring the performance of ITIS and associated information systems

**SYSTEM PERFORMANCE**
- % of evaluated functionalities with correct functioning / needing adjustment / with bugs to be fixed
- % of electronic recording and reporting system users trained and active out of target number of users
- Number of months delay in implementing electronic recording and reporting action plan
- User friendliness and operator satisfaction ratings (user survey needed to measure these indicators)
- Quarterly or annual cost of electronic recording and reporting system implementation and maintenance per TB patient entered in the system
- Cumulative annual or monthly downtime of central server

**SYSTEM COVERAGE**
- Number of TB or DR-TB units where the system has been rolled out and is in use (and % out of all units in the country) by the end of a quarter or end of a calendar year.
- Number of TB or DR-TB units trained with at least one person trained and using the system (and % out of all units where the system has been rolled out) by the end of a quarter or end of a calendar year.

**DETECTION, REGISTRATION AND TREATMENT**
- Number of TB suspects screened for TB and registered in the electronic recording and reporting system during a quarter or during a calendar year.
- % of TB suspects that are screened and registered in the system out of all TB suspects screened and registered during a quarter or during a calendar year.
- Number of TB cases diagnosed and registered in the system during a quarter or during a calendar year.
- Number of TB patients registered in the system during a quarter or during a calendar year with HIV status also recorded.
- % of TB patients registered in the system during a quarter or during a calendar year with HIV status also recorded.
- Number of MDR-TB suspects screened for DR-TB and registered in the system during a quarter or during a calendar year.
- % of MDR-TB suspects screened and registered in the system out of all MDR-TB suspects screened and registered during a quarter or during a calendar year.

**TB OR DR-TB PROGRAMME ACTIVITY**
- Number of TB or DR-TB patients registered in the system who started treatment during a quarter or during a calendar year.
- Number of TB patients registered in the system during the previous calendar year for whom treatment outcomes have been recorded.
- % of TB or DR-TB patients whose outcomes are being recorded in the system out of all newly registered patients during a quarter or during a calendar year.

**DRUG MANAGEMENT**
- Number of forecast exercises conducted to compare actual second-line drug consumption with projected consumption predicted by the system
- % accuracy between real second-line drug consumption versus projected consumption with electronic recording and reporting system
- Number of stock outs at sites using the drug management component of the system
- Calculated number of months of stock available at a specific time for each drug at each site using the drug management component of the system
- Average time taken during a calendar year to receive a given drug at a given site after an order has been placed
8. References

9. Annexes

9.1. Schedule of visits

Team A

24 November – Manila – Briefing; San Lazaro Hospital
25 November – Province of Iloilo - Western Visayas Medical Center (WVMC); Igbaras Municipal
26 November – Province of Negros Occidental - Bacolod city Health Office; Pablo Torre Memorial Hospital; Teresita L. Jalandoni Provincial Hospital
27 November – Quezon city (Manila) - Toro Hills Health Center; Batasan Hills Super Health Center
28 November – Manila - Debriefing

Team B

24 November – Manila - Briefing; Philippines Lung Center
25 November – Batangas - Medical Center; Manila- RITM/NTRL
26 November – Manila - DOH-NTP, PMDT & ITIS teams; Caloocan City (Manila) - Grace Park Health Center
27 November – Caloocan City (Manila) - Dr. Jose N. Reyes Memorial Medical Hospital
28 November – Manila - Debriefing

9.2. Visiting teams

Team A

Fuad Mirzayev (Global TB Programme (GTB) - World Health Organization – Geneva – Switzerland)
Taufhid Islam (World Health Organization Regional Office W Pacific – Manila - Philippines)
Mohammed Yassin (TB Adviser, Global Fund)
Qi Cui (Portfolio Manager, Global Fund)
Celine Garfin (NTP Manager)
Noel Macalalad (head of NTRL)
Maricel Trono (NTP)
Vivian Lofranco (LCP)
Marl Mantala (TASC)
Ruth Chi (IMPACT)
Arnyl Araneta (PBSP)

Team B

Dennis FALZON (Global TB Programme (GTB) - World Health Organization – Geneva – Switzerland)
Tom HIATT (World Health Organization Regional Office W Pacific – Manila - Philippines)
Woojin LEW (World Health Organization Country Office – Manila - Philippines)
Wilson Lo (Global Fund)
Rosalind Vianzon (NTP)
Ramon Basilio (NTP)
Cindy Ama (NTRL)
Donna Gaviola (NTP)
Stuart Pancho (LCP)
Kathryn Roa (USAID)
Andro Gutierrez (KMITS)
Franco Bonifacio (PBSP)
Princess Mangao (SIAPS)
9.3. List of figures

Figure 5-1. Philippines Department of Health organogram for PMDT .......................................................... 14
Figure 6-1. Sites visited in Iloilo and Negros Occidental ........................................................................... 20
Figure 6-2. Sites visited in metro Manila .................................................................................................. 24
Figure 7-1. Groups and subgroups referred for Xpert MTB/RIF testing and aggregation for reporting .......... 26
Figure 7-2. Diagnostic algorithm using Xpert MTB/RIF in Philippines ....................................................... 28
Figure 7-3. Online form for reporting of suspected ADRs (The Philippines FDA) ........................................ 35
Figure 7-4. Module for reporting ADRs (left) and criteria for filtering records (right), IT IS ......................... 36
Figure 7-5. Schematic representation of the relationship between ITIS and other information sources .......... 36
Figure 7-6. Module for the trail of use activity, IT IS ................................................................................ 39
Figure 7-7. Chain of flow of TB information, PMO and laboratory structures ............................................ 40
Figure 7-8. Query screen for report generator(treatment interim outcomes, DR-TB), ITIS .............................. 41
Figure 7-9. An example of discrepancies between reports generated using IT IS and manually ............... 42

9.4. List of tables

Table 1. PMDT in Philippines, indicators and targets .................................................................................. 15
Table 2. Targets by type of facility .............................................................................................................. 15
Table 3. PMDT expansion 2003-2014 ......................................................................................................... 16
Table 4. San Lazaro Hospital enrollments ................................................................................................ 17
Table 5. San Lazaro Hospital treatment outcomes (2011) ....................................................................... 17
Table 6. Western Visayas Medical Center enrollments ............................................................................ 18
Table 7. Xpert testing in Western Visayas Medical center ....................................................................... 18
Table 8. Western Visayas Medical Center Cat IV treatment outcomes (2011) ........................................... 19
Table 9. Pablo Torre Memorial Hospital enrollments ............................................................................... 21
Table 10. Treatment outcomes in Pablo Torre Memorial Hospital (2011) ............................................... 21
Table 11. Teresita L. Jalandoni Provincial Hospital enrollments ................................................................. 22
Table 12. Batasan Hills Super Health center enrollments ....................................................................... 22
Table 13. Xpert MTB/RIF testing results in Philippines, January-September 2014 ................................. 26
Table 14. Distribution of all Xpert MTB/RIF tests by treatment history of referred presumptive DR-TB cases ................................................................................................................................. 27
Table 15. Results of Xpert testing in San Lazaro Hospital GeneXpert site .................................................. 27
Table 16. San Lazaro hospital GeneXpert site testing results by treatment history and R resistance ....... 27
Table 17. Number of GeneXpert sites in Philippines by year ................................................................ 29
Table 18. DR-TB treatment outcomes in Philippines .............................................................................. 30
Table 19. Registered TB and RR-/MDR-TB cases by Region, Philippines (as on 10.12.2014) ................. 37
Table 20. Main forms for recording and reporting, NTP Philippines, 2014 (those additional to ones recommended by WHO in 2013 are in italics) .......................................................... 49
Table 21. Possible indicators for monitoring the performance of ITIS and associated information systems ........................................................................................................................................................................... 50