The Joint External TB Monitoring Mission (JEMM TB)

Indonesia, 16-27 January 2017
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## Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>AIDS</td>
<td>Acquired Immune Deficiency Syndrome</td>
</tr>
<tr>
<td>ANC</td>
<td>Antenatal Care</td>
</tr>
<tr>
<td>APBN</td>
<td>Anggaran Pendapatan dan Belanja Negara</td>
</tr>
<tr>
<td>APBN-P</td>
<td>Anggaran Pendapatan dan Belanja Negara Perubahan</td>
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<tr>
<td>ART</td>
<td>Anti retroviral Treatment</td>
</tr>
<tr>
<td>Bappenas</td>
<td>Badan Perencanaan Pembangunan Nasional</td>
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<tr>
<td>BCG</td>
<td>Bacille Calmette-Guérin</td>
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<tr>
<td>BPJS</td>
<td>Badan Penyelenggara Jaminan Sosial</td>
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<td>BPPSDM</td>
<td>Human Resources for Health Board</td>
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<tr>
<td>CME</td>
<td>Continuous Medical Education</td>
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<tr>
<td>CSO</td>
<td>Civil Society Organization</td>
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<tr>
<td>DAK</td>
<td>Dana Alokasi Khusus</td>
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<tr>
<td>DJPK</td>
<td>Direktorat Jenderal Perimbangan Keuangan</td>
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<tr>
<td>DRS</td>
<td>Drug Resistance Survey</td>
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<tr>
<td>DST</td>
<td>Drug Susceptibility Testing</td>
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<tr>
<td>DHO</td>
<td>District Health Office</td>
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<tr>
<td>FKRTL</td>
<td>Fasilitas Kesehatan Rujukan Tingkat Lanjut</td>
</tr>
<tr>
<td>FKTP</td>
<td>Fasilitas Kesehatan Tingkat Pertama</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GNI</td>
<td>Gross National Income</td>
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<tr>
<td>GoI</td>
<td>Government of Indonesia</td>
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<tr>
<td>GP</td>
<td>General Practitioner</td>
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<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
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<tr>
<td>IDI</td>
<td>Indonesian Medical Association</td>
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<td>IDR</td>
<td>Indonesian Rupiah</td>
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<tr>
<td>JEMM</td>
<td>Joint External Monitoring Mission</td>
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<tr>
<td>JKN</td>
<td>Jaminan Kesehatan Nasional</td>
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<tr>
<td>KIS</td>
<td>Healthy Indonesia Card</td>
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<tr>
<td>KKS</td>
<td>Kartu Keluarga Sejahtera</td>
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<tr>
<td>MDG</td>
<td>Millennium Development Goals</td>
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<tr>
<td>MDR-TB</td>
<td>Multidrug-Resistant Tuberculosis</td>
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<tr>
<td>MDTF</td>
<td>Multi-Donor Trust Fund</td>
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<tr>
<td>MoH</td>
<td>Ministry of Health</td>
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<td>MOIA</td>
<td>Ministry of Internal Affairs</td>
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<tr>
<td>NGO</td>
<td>Non Government Organization</td>
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<tr>
<td>NIHRD</td>
<td>National Institute for Health Research and Development</td>
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<td>NTP</td>
<td>National Tuberculosis Program</td>
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<tr>
<td>NTRL</td>
<td>National Tuberculosis Reference Laboratory</td>
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<tr>
<td>OOP</td>
<td>Out-of-Pocket</td>
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<tr>
<td>P2JK</td>
<td>Pusat Pembiayaan Jaminan Kesehatan</td>
</tr>
<tr>
<td>PHO</td>
<td>Provincial Health Office</td>
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<tr>
<td>PNC</td>
<td>Postnatal Care</td>
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<tr>
<td>Poskesdes</td>
<td>Pos Kesehatan Desa</td>
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<tr>
<td>Posyandu</td>
<td>Pos Pelayanan Terpadu</td>
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<tr>
<td>Pusdatin</td>
<td>Centre for Health Data and Information of MoH</td>
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<tr>
<td>Puskesmas</td>
<td>Pusat Kesehatan Masyarakat</td>
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<tr>
<td>Rifaskes</td>
<td>Riset Fasilitas Kesehatan</td>
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<tr>
<td>SDG</td>
<td>Sustainable Development Goal</td>
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<tr>
<td>TB</td>
<td>Tuberculosis</td>
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<tr>
<td>TNP2K</td>
<td>Tim Nasional Percepatan Penanggulangan Kemiskinan</td>
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<tr>
<td>TSR</td>
<td>Treatment Success Rate</td>
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<tr>
<td>UDB</td>
<td>Unified Database</td>
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<td>UHC</td>
<td>Universal Health Coverage</td>
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<tr>
<td>UN</td>
<td>United Nations</td>
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<tr>
<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
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<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
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<tr>
<td>Wasor</td>
<td>District/Provincial TB Officer</td>
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<td>WHO</td>
<td>World Health Organization</td>
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Executive Summary

Introduction

This report of the Joint External TB Monitoring Mission (JEMM TB), 16-27 January 2017, was undertaken by Indonesian experts from the Ministry of Health (MoH), the National Tuberculosis Programme (NTP), universities, the non-governmental sector, community service organisations, and external experts from Indonesia’s partners in the fight against TB.

The Government of Indonesia, with all the Member States of the World Health Organization (WHO), adopted the End TB Strategy in May 2014, thus committing to end the global TB epidemic. This is a great responsibility for Indonesia, which alone bears one tenth of the global burden of TB. It requires implementing bold policies, addressing persistent health system weaknesses, and the social and economic determinants driving the TB epidemic.

Indonesia has also committed to the Sustainable Development Goals (SDGs), many of which can both contribute to the fight against TB, and at the same time benefit from better TB control. The multi-sectoral approach of the SDGs requires collaboration across government ministries, public and private sectors, NGOs, CSOs, and communities - with which the NTP needs also to engage.

The United Nations will hold the first ever High Level Meeting on TB in 2018, in New York, preceded by the Global Ministerial Conference in Moscow “A Multi-sectoral Response to End TB in the Sustainable Development Era”. A Ministerial Meeting to End TB in the South East Asia Region took place in March, 2017. As Indonesia harbours approximately a quarter of undiagnosed patients globally, the eyes of the world will be focused here.

The mission aims to provide an analysis of the TB situation, and of Indonesia’s TB control efforts, and to provide recommendations for further strengthening of TB control services to reach the targets of the National TB Plan 2015-2019, the End TB Strategy, and the Sustainable Development goals and targets which pertain to TB. The mission undertook field visits to DKI Jakarta, Central Java, West Sumatra, South Kalimantan, and South-East Sulawesi and held discussions with key agencies in the health field in the country.

Burden

The task confronting Indonesia is considerable: Indonesia has the 2nd highest TB burden in the world (over 1 million estimated cases occurring per year) with the 2nd highest number of estimated cases (690,000) not reported to the National Tuberculosis Programme (NTP) – the so-called “missing cases”. While around 7,500 of the notified cases die, there are probably over 100,000 deaths every year among those not notified.

TB can affect any age, or class, but patients are mainly poor, and more men are affected than women. Urban areas are more affected than rural areas. The malnourished, prisoners, and people already sick with compromised immune systems, including HIV and diabetes, are vulnerable to TB.
The uncontrolled epidemic of HIV is creating as many as 78,000 extra TB cases per year, yet the NTP and NAP are finding less than 5% of those who are co-infected. MDR-TB is emerging as a massive organisational and financial challenge to the NTP with over 30,000 cases occurring each year, yet only 1,848 (6%) cases started on treatment in 2016. Eventually, this risks exchanging a mostly drug susceptible epidemic of TB into a mostly drug-resistant epidemic, with huge costs in the future. Unusually, significant numbers of those with HIV and with MDR-TB refuse treatment because of stigma and worries about side effects, which are insufficiently addressed by health staff.

The total economic burden imposed by TB in one year in Indonesia is around US$ 5.46 billion, using the recent prevalence data. Loss of productivity due to premature death is responsible for 63% of the total cost and disability accounts for 31%. These figures represent catastrophe for any family already impoverished. Yet every rupiah invested in TB control has a forty—fold economic return on investment.

**Achievements**

Importantly, health insurance coverage now reaches 66 % of the population and provides free of charge health services to the poorest in society. The insurance covers the essential elements of TB care provision by both public and private providers including diagnosis and treatment. This is a major step towards universal access to TB care.

Indonesia has successfully treated 81% of the 1.3 million cases known to have been treated since 2012, saving over 1 million lives. In 2015, case notifications were over 330,000 (but this is only 32% of the estimated incident cases). Puskesmas provide basic TB services, combining case finding with family health interventions and reaching treatment success rates of over 80% in 8 of the 34 provinces.

Indonesia has produced a flow of appropriate policy documents which lay out the approach to TB control. They are in line with WHO recommendations a National Strategic Plan (NSP) 2016-2020, has been prepared (in addition to the NSP of 2015-2019), and aims to achieve universal access to quality TB diagnosis and treatment.

The latest diagnostic technology has been successfully introduced (GeneXpert MTB/RIF), there is a national policy to use it for all presumptive cases, and there are over 500 machines in the country already.

Collaboration of the public and private sectors was started in 2000. There has been progress with private hospitals through the ‘hospital-DOTS-linkages’ initiative, although it remains incomplete. Coordination of the TB and HIV/AIDS control programmes has been set up at national level.

Programmes to treat drug-resistant TB have been started in 33 provinces. The first nationwide anti-TB drug resistance survey (DRS) is planned to start this quarter, organized by the MoH.

The health and economic benefits of the NTP have been enormous, with an estimated US$ 3.1 billion gain to the Indonesian economy in 2016, relative to the absence of NTP services.
Challenges

The biggest single challenge to TB control in Indonesia is the estimated 690,000 missing cases that occur each year, yet case detection in the programme remains flat at about 300,000 cases per year since 2009. The majority of the missing cases are believed to be in the private sector and unreported, although some may be unable to access diagnosis and care at all.

As in other countries, we are concerned about the quality of care in the private market. Private providers, especially the private pharmacies, account for 74% of initial care-seeking, and 51% of treatment, but only 9% of case notification. One survey of 547 general practitioners (GPs) in 8 Indonesian cities in 2011 found that only 10% had been properly trained in TB, less than half used smear microscopy for TB diagnosis, only 28% followed the NTP regimen and 9% prescribed unnecessary 2nd line drugs. The treatment success rate at Puskesmas level is, on average, significantly higher than in the private sector, where treatment delays, sustained transmission, increased multi-drug resistant TB, catastrophic expenses and impoverishment are more likely. Yet public sector input on TB care in the private sector is minimal and little has been done to engage the private primary care sector.

A further 27% of TB patients are treated in the public hospitals, half of which are not linked with the NTP and may also be providing sub-standard treatment. Public hospitals report only 18% of the notified cases. Nearly half of patients are paying for their care out of their own pockets, at the risk of incurring debt and impoverishment.

A major observation of this review is that the flow of appropriate policies produced by the Central Unit of the NTP is not implemented in practice. At the peripheral levels of the NTP (provinces and puskesmas), sufficient, competent human resources are lacking at Puskesmas, district and provincial level to guide, supervise, and advocate for, TB program implementation in public and private sectors, let alone the ambitious scale-up of case finding planned in the NSP. The TB laboratory network is under-performing – sputum smears are not well done and the new rapid diagnostic tests (GeneXpert MTB/RIF) are being rolled out too slowly. The quality of clinical care is often low, and there is no linkage between health insurance payments and quality of TB care. Intermittent treatment is still prescribed, which is against international recommendations. Efforts to address the problem of MDR-TB and HIV-associated TB are only dealing with about one-tenth of the burden. Currently, contact investigation and management is not systematically implemented - a missed opportunity to avoid additional TB cases. A very high mortality and transfer out rate were observed in one prison facility (18/70 (26%) and 46/70 (66%), respectively, in 2015) where medical care appeared absent.

In conclusion, the JEMM 2017 notes that the implementation of the NSP for 2015-2019 is not on track. The anticipated upswing of performance in response to the prevalence survey has not yet happened. To achieve this, greater attention needs to be paid to the quality of TB service provision throughout the health system. The JEMM recognises that some constraints to implementation are part of the wider challenge of decentralisation. TB control could therefore act as a marker of good practice in the ways districts address their decentralised responsibilities.
Opportunities

The biggest opportunity is provided by the recent introduction of the JKN health insurance scheme which aims for universal health coverage and offers the prospect of relief from incurring excessive, and especially catastrophic, expenditure for patients and families with TB.

Because the payments made by BPJS (the Social Security Management Agency) currently do not sufficiently reinforce the desired behaviours of facilities, the primary care level capitation fee needs to be complemented with performance-based incentives, and the secondary care payments need adjustment to encourage down-referral of simple cases. These issues are recognised by JKN and it is possible to address them.

Encouraging models of public-private collaboration exist (e.g. private sector coordination by the pulmonologists’ professional association, pharmacies preventing over the counter sales of TB drugs in Jogyakarta) and there are many local innovations in service delivery, where lessons can be learnt.

Mandatory notification has been approved, and can increase notification, if it is enforced. Accreditation schemes, linked to health insurance have potential to improve the quality of TB care across the public and private sectors. The MOIA circular on district funding for TB control, based on the MoH Minimum Service Standards for Healthcare includes a detailed framework for increased funding of TB control through district budgets. Coordination by BAPPENAS of the (funding for) inter-sectoral collaboration can lead to increased co-investments.

Recent purchases of over 500 GeneXpert machines offer a rapid and massive increase in capacity of drug susceptibility testing. The planned introduction of the shorter treatment regimen for MDR-TB will make treatment easier for patients and staff.

Indonesia has a clear strategic plan, with all policies in place to achieve a 10% annual decline of the epidemic, if well-resourced and implemented.

Recommendations

1. In order to increase case finding, notifications and access to care, the JEMM strongly advises the MoH to drive massive engagement of private providers - and shift treatment from hospitals to the primary care level - by adjusting payment mechanisms in both primary (FKTP) and hospital (FKRTL) systems of JKN. This would capitalize on the extraordinary opportunity created by expansion of JKN to transform TB control in Indonesia. Specifically, the MoH and NTP should:
   a. Make full use of JKN to create incentives to encourage appropriate diagnosis, notification and care at private primary care level. These may include:
      i. Add a payment for TB case notification to the non-capitation element of primary care payment (alongside delivery, ANC/PNC and family planning);
ii. Encourage high TB case notification, and reward TB training, using the capitation performance-adjustment formulae;

iii. Revise hospital tariffs to encourage down-referral and facilitate better monitoring of hospital behaviour;

iv. Rather than moving capitation during the diagnostic process, compensate puskesmas and hospitals for providing specific TB diagnostic services (smear microscopy, Xpert, and chest X-ray (CXR)) ordered by puskesmas (CXR) and private PHC providers (smear, Xpert and CXR).

b. Make optimal use of mandatory notification, accreditation and continuous medical education for professionals to ensure the quality of TB care funded by health insurance.

c. Ensure access to health insurance for the very poor and near poor and people with inadequate documentation.

2. The JEMM strongly advises the MoH to greatly increase the public sector focus on engaging all care providers and civil society, including:

a. Strengthen district and sub-district PPM networks making use of all available domestic and international resources to launch urban TB initiatives with strong public-private-community partnerships and local ownership in several urban districts, engaging large numbers of private providers of all sorts and public hospitals, developing and testing models and systems that can be sustained beyond the initial stages by regular district and sub district teams;

b. Set up a multi-stakeholder mechanism comprising key stakeholders including JKN, IMA, private hospitals’ association, associations of private pharmacies and laboratories, regulatory bodies and potential intermediary agencies and community systems engaged in TB control in order to design, implement and monitor (with clear targets and milestones) a phased scale up of effective, (sub) district-based, private provider engagement for delivery of quality TB care. This is essential to make rapid progress in a relatively uncharted work area;

c. Set an ambitious targets for the number of cases notified by private primary care providers, in the NSP 2016-2020, for instance at least 60/100,000 population;

d. Improve understanding of how private primary TB care providers operate by a range of focused studies in collaboration with partners, including the World Bank.

3. The JEMM urges the MoH and NTP to double current funding and mobilize the human resources necessary for full implementation of the NSP, 2016-2020, ensuring high quality of service provision. The NTP has to reach out to other agencies, directorates and entities within and outside the MoH to implement the NSP, by:

a. Increasing staff working on TB at the Central Unit, Provincial Units and Puskesmas, and improving their quality so that policy gets into practice. Particular attention should be paid to the leadership and management functions of staff, and to the huge needs in the larger provinces and districts, so that supervision improves, the effects of stigma are addressed, daily treatment throughout is implemented, and specific staff can engage with private providers;
b. Increasing funding for TB control by expediting guidance to the development of district action plans for TB control – including how to develop strategies, activities, and budgets; identifying the streams of funding that can finance increased TB activity budgets, incorporating TB-related performance-based indicators in these financing flows, and defining the actions necessary to meet the Minimum Service Standard (SPM) for TB;

c. Making detailed agreements with related ministries on their collaboration in TB control, with clear responsibilities, deliverables, targets and timelines;

d. Scaling up prevention, diagnosis and treatment services for TB-HIV co-infected patients, focusing initially on the 141 high HIV burden districts in the country by expanding facilities for rapid TB and HIV diagnosis and linkage to treatment, and address other key populations such as children, prisoners, diabetics etc;

e. Revising the existing laboratory network with clear roles and responsibilities and sufficient trained staff at all levels to ensure universal access to high quality TB diagnoses;

f. Without further delay, expanding the response to MDR-TB by including modern molecular diagnostics, decentralized treatment, new shorter MDR regimens, new anti-TB drugs for patients not able to receive the shorter MDR regimens, and a robust system of management, supervision and monitoring.

4. To improve the reporting of diagnosed cases, the JEMM urges the NTP to invest in swiftly and significantly improving the SITT and expediting mechanisms to capture all TB cases, in both public and private sectors, including prisons. A TB module should be integrated with the future eHealth environment in Indonesia (SIP).

5. The JEMM urges the country to explore a Presidential Initiative on TB in order to enable and accelerate the multi-sectoral response to this preventable and treatable epidemic and ensure, in advance of the 2018 UN High Level Meeting on TB, that Indonesia is making the necessary investments to end TB.

Postscript

Before departure of the team, meetings were held with the Deputy Coordinator of Health Improvement, Coordinating Ministry for Human Development and Cultural Affairs, and the Secretary of the Directorate General of Regional Autonomy, Ministry of Internal Affairs (MOIA). The Coordinating Ministry of Human Resource Development chairs the Board of the JKN and therefore has a significant influence on the policies and approaches of the JKN. Dr Sigit, the Deputy Coordinator, and ex Director DTDC in the MoH, responsible for TB control at the time of the Prevalence Survey, asked some very penetrating questions, and was concerned about the lack of progress of PPM efforts until now. He perceived that GeneXpert was indeed essential to identify more cases, and was concerned about the influence of the medical schools on the knowledge and
practice of private practitioners. Dr Mukund Uplekar, WHO, Geneva, made some clear suggestions on how to bring the medical schools into the NTP’s activities based on the experience of India. Dr Sigit concluded by expressing his willingness to address particularly the recommendations for JKN to drive appropriate behaviours by hospitals, puskesmas and private practitioners. The fees for service for TB activities could be based on diagnosis related groups, but will need the technical input of the NTP to define these groups.

Mr. Anselmus Tan, the Secretary at the MOIA, noted that leadership on many health issues was now with local government. The districts needed clear guidance on their development priorities in order to create their annual budgets. A circular letter to all districts was about to go out to advise and guide them in their functions. He advised that the NTP needs to make very clear suggestions for actions to take at district level to go into this letter. The NTP needed to work fast to take advantage of this brief window of opportunity, and support the entry of sound, improved, TB policies into district action plans.

1. Introduction

   a. Goals of the Review

   The objectives of the JEMM and its expected outcomes are laid out in Annex 1. They are comprehensive and generic. As the Review unfolded it rapidly became apparent that the key strategic focus was the gap between estimated incidence and the notified cases. These “missing cases” are clearly in the private sector, governmental but non-MoH facilities, and, probably in poorer parts of the country, undiagnosed, and hence, untreated. This focus brings into play the performance of the private sector, and especially mechanisms to notify cases from all facilities, both public and private, as well as to monitor their performance in TB management. The costs to a family, or a community, of a case of TB emphasize the crucial role of health insurance and social protection. The sections dealing with these issues are therefore quite detailed and go beyond what is usually presented in reviews of TB programmes. This is quite deliberate because this is where the action should lie in contemporary TB control in Indonesia.

   b. Organisation of the Review

   The preparations for the Joint External TB Monitoring Mission (JEMM TB), were undertaken by staff of the NTP in collaboration with WHO’s Country Office and partners. The review took place from January 6 to 16, 2017 and was undertaken by Indonesian experts from the Ministry of Health (MoH), the National Tuberculosis Programme (NTP), universities, the non-governmental sector, community service organisations, and external experts from Indonesia’s partners in the fight against TB.

   The mission undertook field visits to DKI Jakarta, Jawa Tengah (Central Java), Sumatera Barat (West Sumatra), Kalimantan Selatan (South Kalimantan), and Sulawesi Tenggara (South-East Sulawesi) as well as discussions with key agencies in the health field in the country (Figure 1).
2. Background

a. Socio economic performance

Today, Indonesia is the world’s fourth most populous nation, and 10th largest economy in terms of purchasing power parity, and a member of the G-20.

The largest economy in Southeast Asia, Indonesia has charted impressive economic growth since overcoming the Asian financial crisis of the late 1990s. Its gross domestic product (GDP) reached a peak of US$ 900 billion in 2012, but has since fallen back slightly (Figure 2). The country’s gross national income per capita rose from $560 in the year 2000 and peaked in 2012, falling back to $3,374 in 2015 (Figure 3). An emerging middle-income country, Indonesia has made enormous gains in poverty reduction, cutting the poverty rate by almost a half since 1999, to 11.2% in 2015.

Indonesia’s economic planning follows a 20-year development cycle, currently spanning from 2005 to 2025. It is segmented into 5-year medium-term plans, called the RPJMN, each with different development priorities. The current medium-term development plan – the third phase of the long-term plan – runs from 2015 to 2020, focusing, among other things, on infrastructure development and social assistance programs focused on education and health-care. Such shifts in public spending have been enabled by a reform of long-standing energy subsidies, allowing for more investments in programs that directly impact the poor and near-poor.

However, considerable challenges remain. A continued slump in demand for commodities – the fuel for Indonesia’s economic boom in the past decade – has led to moderating GDP growth. Trade has fallen, as has expansion of investment, and domestic consumption – long the main driver of growth – is also less buoyant. These developments have slowed the pace of poverty reduction.
While the poverty rate declined by 1% annually from 2007 to 2011, since 2012 poverty has fallen by an average of only 0.3% per year. Hence out of a population of 258 million in 2016, more than 28 million Indonesians still live below the poverty line. However, about 40% of the entire population remains vulnerable to falling into poverty, as their incomes hover marginally above the national poverty line, set at IDR 330,776 per person per month (US$ 22.60). If not reversed, the gap between rich and poor, already increasing in recent years, may widen. At 41, Indonesia’s GINI coefficient – a measure of inequality - is higher than in neighbouring countries. Another challenge to efforts at reducing poverty – and to the 1.7 million youth who enter the workforce each year – is the slower pace of job creation. Employment growth is now slower than population growth. Even though the birth rate has flattened off (Figure 4), the population continues to rise.

Life expectancy at birth in 2015 was 67 years for males and 71 for females. Indonesia is thus in the midst of a demographic shift, with declining fertility rates and with the fraction of elderly yet to rise sharply. Indonesia could therefore enjoy a ‘demographic dividend’ in the next decade as the working age population increases relative to the rest of the population, provided that jobs can be created fast enough.

In order to strengthen the investment climate and economic growth, the government continues to announce policy reforms intended to ease red-tape. Investors welcome the policy reforms, which include opening up sectors for investment and reducing high logistics costs. A long-anticipated cabinet reshuffle also reflects the government’s commitment to further reforms, as well as the consolidation of the political coalition supporting the administration.

Figure 2. Total GDP for Indonesia, 1967 – 2015, in US$ (not adjusted for purchasing power)  

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Figure 3. GNI per Capita for Indonesia, 1967-2015, in US$

Figure 4. Birth Rate in Indonesia, per 1,000 people, 1960-2014
Source: https://knoema.com/atlas/indonesia/Birth-rate accessed 2 March 2017

b. Financing, governance, structure and performance of the health system

i. Financing of health

Total health expenditure was around 2.9% of GDP in 2012, and 1.2% of GDP was the public sector contribution\(^3\), the remainder being the private sector contribution. Out of pocket expenditure was measured at 75% of the private sector contribution and therefore is still high in spite of the introduction of state health insurance.

Indonesia has committed to universal health coverage by 2019. The institutional framework for UHC was achieved through the passage of the 2004 National Social Security System Law requiring health insurance for the entire population. In 2011, the Social Security Provider’s Bill Law established a national social security agency Badan

Penyelenggara Jaminan Sosial Kesehatan (BPJS) to undertake implementation of the UHC program Jaminan Kesehatan Nasional (JKN). Enrolment will be mandatory for all, with the formal sector (civil servants and salaried employees in the private sector) having already been enrolled by employers based on a premium equivalent to 5% of their salary. Informal workers, the majority of whom are not enrolled, can choose a monthly premium (minimum of IDR 23,000 - maximum IDR 59,000) based on three tiers of care. Through BPJS, the government has committed to financing social insurance coverage for the poorest 40 percent of the population who are registered as instalment payment beneficiaries. Around 35 percent of the initially targeted “poor” (92 million) have been registered equating to about 70 percent of all current JKN memberships.

The World Bank’s Health Financing System Assessment (HFSA) provides an excellent description of the current state of health financing in Indonesia. Its findings include:

- Government expenditure for health is increasing, but slowly, and from a very low baseline.
- A rapid assessment across 44 districts showed health’s share of the district budget varying from 3% to over 18%, with an average of 10% in 2013.
- The number of hospitals has doubled over the past decade; more than half were private hospitals.
- For government health expenditure in 2013, 57% of spending occurred at the district level, 36% centrally, and 7% at the province level.
- In the absence of explicit rationing in JKN (i.e., which services are covered), there is implicit rationing based on access, and low supply side availability. The poor and those in remote areas therefore receive far less benefit from JKN than others.
- There is overlap and no clear division of which financial flows should finance curative care vs public health functions – though JKN is focused more on curative.
- JKN coverage still has a “missing middle”. The government and formal employers pay premiums for many of the identified poor and for formal employees, respectively, but the lower-middle class remain largely uncovered.
- Thus far, the increase in JKN coverage has not reduced out-of-pocket (OOP) expenditure.
- Funding is fragmented across multiple levels of government and funding flows, resulting in fragmented governance, and unnecessary management costs.

ii. Governance and health system structure

Indonesia is a republic with a constitution, a democratically elected president, and executive, judicial and legislative branches of government. The country consists of 34 provinces, each with a governor and legislature. Provinces are composed of 416 districts and 98 municipalities responsible for government services. Sub-districts (6,543) are divided into villages (75,225), which are in turn divided into citizen groups and, finally, neighbourhoods.
The organization of health services is the responsibility of Ministry of Health officials at district, province and national level. The network of public health services follows the political structure of the country. Following the reforms of 2001, administrative and financial responsibility have been decentralized to province and district level.

There are a total of 12,242 health facilities in the country which include 9,754 sub-district public health centres (termed Pusat Kesehatan Masyarakat or puskesmas). There are 2,488 hospitals of which 1,593 are public hospitals (including 167 military/police facilities) and 895 private hospitals. More peripheral than the sub-district level are satellite and mobile health centres with 94% of the population living within 5 kilometres of a facility. There are approximately 90,000 licensed practitioners of medicine and an unknown number of licensed traditional practitioners. Licensing is coordinated by the Indonesian Medical Association (IDI) and the National Association of Traditional Healers and is granted by government at local level.

Like funding, responsibility for health activities is also fragmented and divided between a number of ministries. Coordination of financing of activities is through the Planning Bureau at each of these levels to which programs submit budgets up to a fixed ceiling. Services for tuberculosis patients are included in the Directorate General of Prevention and Disease Control (PDC) at the Ministry of Health (Figure 5). Training and capacity building are the responsibility of the Board for Development and Empowerment of Health Human Resources (BPPSDM); accreditation, licensing, laboratory services and infection control rest with the Directorate General of Health Services. Responsibility for the health information system resides with the Secretariat General. Management of local services is coordinated by the Ministry of Internal Affairs. The TB Sub-Directorate, under the DG PDC of the MoH, manages daily activities of tuberculosis control in Indonesia. TB services delivered through the public sector component of the health system take place in primary health care centres (PHCs, or puskesmas) and hospitals (Figure 6). The PHCs (puskesmas) and hospitals are managed under the Directorate General of Health Services (YANKES = Pelayanan Kesehatan). In addition, other government departments such as prisons and military services, as well as non-governmental actors like private providers and companies, provide TB services.
Figure 5. Organogram of Ministry of Health
Source: MoH
Figure 6. Structure and organization of the delivery of health services

Source: MoH

Note:
Puskesmas has dual roles as program and health facility

Line of Command: ——— Line of Coordination: ———— Line of Supervision: ————
The overall direction of the MoH is to move from curative and rehabilitative services to a focus on health promotion and disease prevention, with emphasis on non-communicable diseases. During this current five-year period, MoH is supposed to focus on issues of access to, and quality of, essential and referral health care services. Based on the targets set in the draft RPJMN III, the national development plan, the MoH has drafted a strategic plan that details its efforts to contribute to overall development in Indonesia—the RENSTRA 2015 – 2019.

One of the target areas within the goal of improving population health status is decreased communicable disease prevalence, and there are specific targets for TB. A national strategic plan (NSP) for TB was drafted in 2014 and is currently being implemented.

iii. General performance of the health system

While there are great efforts at improving basic public services, the quality of health clinics and schools is uneven by middle income standards, contributing to alarming indicators - particularly in health. For example, the maternal mortality rate in Indonesia in 2015 was 126 maternal deaths per 100,000 live births – higher than the Millennium Development Goal of 102 maternal deaths per 100,000 live births. One in 3 children under the age of 5 suffers from stunting, or shorter height. The neonatal mortality rate was 13.5 per 1,000 live births in the same year. Many statistics are out of date – for example, availability of contraception was last assessed in 2007 at under 50%. Malaria is disappearing, with only 64 deaths reported in 2014.

3. Epidemiology of Tuberculosis in Indonesia

The 2017 Joint External TB Monitoring Mission (JEMM) has provided the opportunity to carry out an in depth epidemiological analysis of TB surveillance data at the national and the sub-national level, as well as review the surveillance systems in place that collect and generate data on TB cases and deaths. The results of this work are in a separate document that is summarised in this section and in Section 14.

a. Findings

Indonesia is the second highest TB burden country in the world with over 330,000 TB cases notified to WHO in 2015. WHO calculated an incidence rate of 395 (95% CI; 255-564) per 100,000 population for 2015, which would mean 1,020,000 (95% CI; 658,000-1,450,000) new and relapse cases occur each year. These estimates were revised upwards from 460,000 incident cases in 2012, following the prevalence survey results in 2013, which found there were 1.6 (1.2 – 1.9) million prevalent cases. For every 5 prevalent TB cases only 1 case was notified to the NTP. Nevertheless, in spite of these new, larger estimates, the burden of TB is falling in Indonesia - incidence and prevalence of TB are estimated to be dropping at about 1% and 2% per year, respectively.

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The country has made important advances in TB surveillance and control by establishing public-public and public-private engagement schemes, implementing and achieving nation-wide coverage of the electronic recording and reporting system in NTP facilities, and introducing mandatory TB notification, as well as improving health sector performance, which has led to an increase in TB diagnoses and reporting coverage. As a result, TB notifications have increased over time but there is still a clear gap, particularly from the private sector and large public hospitals that are not integrated into the NTP. In addition, some patients are in the public sector, and staff have tried to notify them, but the SITT has been unable to include them.

From 2000-2005, there was a steady increase in TB case notifications and rates. This is most likely due to the expansion of DOTS and improvements in access to health care. Since 2005, however, case notification rates have been effectively static, although in 2015, the implementation of the national health insurance scheme may have led to a slight increase in TB case notifications, and this should have a larger impact on TB notifications as coverage increases.

TB is significantly more common among men than among women (Figure 7), and among older ages than in the young (Figure 8). The latter is especially important given the rapidity of ageing of the Indonesian population (Figure 9). TB in the elderly is often more difficult to diagnose due to lack of classic TB symptoms and less obvious pulmonary cavitation on chest X-ray. The prevalence survey showed that there was a large amount of under-reporting with the biggest notification gaps in those over 65 years old. The increase in co-morbidities in the elderly can mask TB, and hence more elderly cases die before diagnosis. The Indonesian population is likely to age more as time progresses, so Indonesia needs a clear strategy for detecting TB in the older population through engagement with the clinical service delivery sector, increasing the index of suspicion in health care staff, and providing a mechanism for screening and referral.

Figure 7. Age and Sex Distribution of TB Notifications in Indonesia 2015

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Diabetes mellitus in both sexes, and smoking in men in particular, should be considered as key risk factors for TB in the country - Indonesia has the highest male smoking rate in the world, which is still rising (Figure 10). The impact of HIV on TB in Indonesia increases notifications, as it does elsewhere, but the true extent of the HIV/TB interaction is unclear since so few cases are tested for HIV. The low levels of treatment of co-infected patients with ART and CPT undoubtedly increases TB mortality rates, and should be addressed urgently.

Figure 8. TB Notification Rates by Age Group, 2000-2015

Figure 9. Population Structure of Indonesia, 2000 and 2015

Figure 10. Percentage of the Population Smoking Tobacco by Sex in Indonesia, 2000-2015

b. Challenges

The biggest single challenge to TB control in Indonesia is the estimated 690,000 missing cases that occur each year, while case detection in the programme remains flat at just over 300,000 cases per year since 2009 (Figure 11). The majority of the missing cases are believed to be in the private sector and unreported, although some may be unable to access diagnosis and care at all.

Figure 11. TB Incidence (includes HIV positive TB) and Notifications in Indonesia, 2000-2015, Showing the Large Gap Between the Two
Source: WHO

The completeness and accuracy of routine TB surveillance and vital registration (VR) systems in Indonesia have to be reassessed as it is clear that notifications do not reflect the true TB burden in the country. This in turn challenges the ability to measure progress towards global and national targets, such as those outlined in the End TB Strategy.

Greater efforts need to be made to find the “missing” or undetected cases and ensure that they are rapidly diagnosed, treated and reported. The TB programme should focus efforts on detecting TB in men, the elderly - and in Java, where the epidemic is most concentrated. The NTP is already planning to quantify the amount of under-reporting from the private sector through an inventory study.

Cases that die, or are lost to follow up prior to starting on treatment, are currently not captured well - primary default is therefore high and TB mortality is underestimated. The treatment success rate, which already falls short of the new WHO 90% target, would be much lower if all deaths and cases lost to follow up were included. The lack of robust mechanisms for following up patients who are referred and those who are lost to follow up, particularly for DR-TB patients, is particularly concerning. The results of the DRS will be important to assess the burden of MDR-TB (currently unknown) but evidence suggests ongoing transmission in the community is likely.

It is currently difficult to use the TB surveillance data to interpret trends over time with any accuracy due to weak supervision and monitoring and evaluation at the sub-national level, the recording issues identified in SITT, and lack of coverage of the system in the private sector and large public hospitals. Furthermore, the impact of introducing Xpert is not currently easy to measure due to problems of recording these data in SITT as well as a lack of linkage to laboratory systems due to the absence of a national unique identifier. In order to understand the TB epidemic better at a sub-national level - which will inform
TB interventions, and gauge the impact of activities implemented by the TB programme - the national team, who are strong and well skilled, must take a lead in implementing robust data validation mechanisms, engaging in PPM activities, providing tools for data capture, rapidly making required changes to SITT and developing data linkages with other systems. Using the data in real time through routine analysis and subsequent feedback to the sub-national level will help to strengthen the TB surveillance system, as well as allow staff to respond to observations that require further investigation, for example, a rapid drop in case numbers, increased loss to follow up, or a decrease in childhood TB.

c. **Recommendations (See also Recommendations, Section 14).**

The NTP should work towards obtaining accurate data with which to inform future interventions. The key areas of focus are;

1. **Provide a direct measure of incidence by improving the TB surveillance system and related activities which ensures timely and accurate notification of all TB cases.** This should be achieved through:
   
a. strengthening of the surveillance system;
   
b. safe-guarding historical data in a national TB database (DHIS2);
   
c. rapidly making required changes to SITT with associated guidelines and training;
   
d. introducing a unique national identifier and using this to link SITT data to other data sources;
   
e. making recording and reporting tools available in private and public hospitals as well as prisons;
   
f. enhancing capacity for good data management and analytical practices of the M&E teams primarily at the sub-national levels;
   
g. carrying out routine analyses of data to inform progress towards achieving targets and improving data quality;
   
h. the inventory study should be completed using standard methodology to measure underreporting TB cases.

2. **Find, diagnose, treat and notify potentially “missing cases” which includes those treated in the private sector, large public hospitals, those on loose drugs, children, all bacteriologically confirmed cases, primary defaulters and drug resistant TB cases.** This will involve:
   
a. engagement of the private sector;
   
b. timely drug susceptibility testing (DST) and culture/GeneXpert for all MDR TB suspects;
   
c. review of drug resistant cases through implementation of an MDR-TB surveillance system;
   
d. engaging with paediatric services for the diagnosis and management of childhood TB;
e. universal contact tracing policy for household and/or close contacts for all TB patients;
f. active case finding targeted at hard to reach and high risk populations;
g. introducing a robust referral and follow up system;
h. the TB programme should also consider interventions which specifically target men and the elderly.

3. **Improve treatment completion by improving supervision to reduce cases with a “not evaluated outcome”, investigating reasons for loss to follow up and exploring introducing community DOT.**

4. **Health system issues: TB financing, social protection, UHC, and regulatory frameworks**

Universal health coverage (UHC)\(^8\) was assessed in terms of protection from financial risk. The remaining three topics are discussed in the context of two over-arching themes—the massive expansion of health insurance, and the large amount of treatment in the private sector which has large, mainly un-notified, treatment volumes (see also Section 6).

**Table 1.**

**Comparison of Treatment Site to Notification Site Highlights Sources of Under-reporting**

Source: Data extracted from WHO Global TB Report 2016, and Indonesia Prevalence Survey Report

<table>
<thead>
<tr>
<th>Treatment site in Indonesia</th>
<th>2015 Notification source as % of total notifications</th>
<th>2015 Notification source as % of estimated total TB</th>
<th>Treatment site of TB patients from prevalence survey (%)</th>
<th>% increase from current case finding, if each individual “channel” starts reporting fully</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHC</td>
<td>~73%</td>
<td>24%</td>
<td>34 (27%)</td>
<td>9%</td>
</tr>
<tr>
<td>Public Hospital</td>
<td>18%</td>
<td>6%</td>
<td>34 (27%)</td>
<td>64%</td>
</tr>
<tr>
<td>Private Hospital</td>
<td>9%</td>
<td>3%</td>
<td>26 (21%)</td>
<td></td>
</tr>
<tr>
<td>Private Clinic</td>
<td></td>
<td></td>
<td>7 (6%)</td>
<td>118%</td>
</tr>
<tr>
<td>Private Practitioner</td>
<td></td>
<td></td>
<td>19 (15%)</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td></td>
<td>5 (4%)</td>
<td>12%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100%</strong></td>
<td><strong>33%</strong></td>
<td><strong>125 (100%)</strong></td>
<td><strong>200%</strong></td>
</tr>
</tbody>
</table>

\(^8\) UHC is defined as all people receiving quality health services that meet their needs without exposing them to financial hardship when paying for them
Social protection for patients and families affected by TB

a. Findings and Challenges

**JKN and protection for poor and vulnerable groups**

Under the WHO End TB Strategy, major progress is required to ensure universal health coverage with financial protection, and other social protection mechanisms, to reduce the burden of indirect costs and income loss due to illness. Indonesia has some of the important elements needed to drive this change, including health insurance, most notably the JKN (Section 2.b).

Although there is vocal political commitment to full coverage of all Indonesians by 2019, it will be challenging to cover the growing numbers classified as poor. For example, there is a gap between the number of poor identified at national level, and the number identified at district level (e.g., under the previous Jamkesda scheme). Inclusion and exclusion errors are high, and the process lacks transparency, putting individuals at risk of stigma and discrimination. Registration in any category of the JKN requires an identity card with a current address, obtained with a birth certificate. For those without a birth certificate, the process requires 3 letters, one each from village, municipal and district officials, verifying identity. The JEMM found examples where these hurdles prevented or delayed TB diagnosis and treatment, and where movement to a new district raised registration and access barriers. Finally, the informal sector, who make up a persistently large share of the population despite economic growth, and are required to pay their own premiums, remain a particularly vulnerable group. The minimum premium of IDR 23,000 per person per month remains high for the ~50 percent of the population that makes less than IDR 600,000/month.

**Current social protection for TB patients**

Drug-sensitive TB treatment is covered through JKN and provided by the general health system (apart from drugs, reagents and other consumables, which are provided by the NTP). Drug-resistant TB treatment remains under NTP and Global Fund funding, outside of JKN. The JEMM found that there are still medical costs incurred by patients including registration at Puskesmas, IDR 5-15,000; doctor’s exam, IDR 15,000; sputum smear (although this is supposed to be free of charge), IDR 5-25,000; and X-rays, IDR 50,000. Transport and geographical challenges remain barriers to access, and other costs such as loss of work income, school absence, and isolation are likely significant but remain un-quantified. Social assistance remains fragmented, limited, and highly dependent on local conditions. MDR-TB patients are eligible for a cash transfer of IDR 750,000/month, which is a major improvement over the previous situation. However the referral process remains unclear, as does the mechanism through which patients access this assistance. The JEMM found that knowledge of this cash transfer among health workers varied as did patient knowledge of

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Social protection is defined as access to essential social services and social transfers, in cash and in kind, paid to the poor and vulnerable to improve their food security and nutrition. It provides a minimum income security, as well as income replacement and social support, in the event of illness.

Estimated at 30-40% mis-targeting by the World Bank’s Social Assistance Public Expenditure Review.
support/counselling groups. While some facilities had additional support for TB patients, these appeared to be ad-hoc packages based on local discretion and budget, including milk, nutritional supplements, and even, in some facilities, free chest X-rays for those with TB symptoms.

**Social assistance landscape**

The government has committed to the expansion of certain social assistance programs. Currently the targeting criteria do not include TB patients, but there are opportunities to link TB patients and households to existing schemes. In 2015, the conditional cash transfer program, Family Hope (PKH), grew from 2.8 million to 3.5 million households and plans to expand to an additional 2.5 million households. While cash transfers are based on meeting certain criteria related to maternal and child health, the JEMM found that dialogue had formally been initiated to integrate TB patients. The rice subsidy program Raska, is also due to expand its targeting to improve nutrition, and there is an opportunity to link to TB patients. In an effort to improve social spending and targeting, the government has created a unified database (UDB) launched by the National Team for the Acceleration of Poverty Reduction (TNP2 K). The UDB includes data from the 5 major social protection programs (JKN/Jamkesda, PKH, Raska, temporary UCT (BSM, or Cash Transfers for Poor Students), and education grants) and includes information on 24 million households (96 million people) ranked by their socio-economic status. The recipients receive their assistance via newly-introduced electronic cards that provide either access to services (Healthy Indonesia Card waives BPJS premiums); and/or access to funds (PKH), and/or in-kind support at designated merchants (Raska). While the inclusion of these programs in one database has made information more available to different sectors, the knowledge about them was limited among health officials in the visited districts, and there was little to no knowledge of the programs available to TB patients.

**b. Recommendations**

**JKN and protection for poor and vulnerable groups**

1. **The NTP should work with relevant actors in the Ministry of Social Affairs and BPJS to review the process of obtaining a national identity card and map out a plan of action to address the challenges faced.** This should include addressing individuals who remain undocumented and without a birth certificate; implementing a solution for those trying to update their ID cards; providing mechanisms for those unable to update their national ID due to imprisonment or migration; and addressing the lack of transparency, bureaucratic challenges and discrimination currently existing in the process.

**Current social protection for TB patients**

2. **The NTP should undertake a patient cost survey to identify where patients are facing costs to better understand its impact on patient outcomes and the potential catastrophic costs associated with TB diagnosis and treatment.**

**Social assistance landscape**

3. **The NTP should engage with the Ministry of Social Affairs and Ministry of Health to map and review national and district level social protection programs (including**
district level health initiatives, and insurance and assistance programs), their application and/or referral processes, and the delivery mechanism to ensure coordination, improve transparency and to examine opportunities for TB patients to be linked to the UDB and included in certain relevant social assistance programs when they are diagnosed.

Regulatory Framework

a. Findings

There is a regulatory framework for licensing of doctors and private clinics, and accreditation of hospitals (by KARS); there are some references to TB in these schemes.

A mandatory TB notification regulation was recently signed by the Minister of Health. The NTP and Challenge TB have agreed on a minimum set of fields to be reported and have started developing an Android app for simpler notification.

b. Challenges

The regulatory steps currently in place are not sufficient to assess quality or drive improvements in TB-related quality of care. The hospital accreditation standards cover administration, existence of a TB SOP, and mandatory TB staff, not outcomes. Accreditation surveyors lack capacity both in terms of their absolute numbers (and therefore ability to reach all hospitals) and TB knowledge.

For GPs to get their license from the DHO, they need a competency letter from the Indonesian Medical Association (IDI). The letter may mention TB, but there is no associated assessment. They also require continuous medical education (CME) points – though those points can be earned many ways other than via TB. Past efforts to institute a specific TB training requirement, or more specific TB certification requirement, have stalled, as the capacity to conduct the necessary trainings or assessments at scale does not exist. The IDI collects member fees and conducts CME, but remains a relatively under-financed organization that is heavily dependent on volunteer efforts. Based on experiences in other countries\textsuperscript{11}, a mandatory notification regulation will not be enough to change practice, especially with the current, very complex TB reporting system.

c. Recommendations

Previous approaches in this area have struggled with practicality and scalability. It is therefore recommended that the NTP and partners re-think the entire approach by forming a regulatory working group to: (a) define what TB practices can and should be required by regulation; and (b) what mechanisms exist to disseminate, implement and enforce these regulations. This plan should consider the HR requirements for such a plan (who will train, assess and enforce), and the capacity building efforts that are presumably needed within regulatory bodies, including KARS, and within IDI or other professional organizations. The modifications to hospital accreditation should be guided by a clinical pathway for TB. The working group should also coordinate with P2JK, BPJS and World Bank on how such

regulations could be reinforced via financial incentives and penalties administered via BPJS (see next section).

**TB Financing**

Each of the TB financing sections address the two major sources of funds:

- Financing through JKN. As one of the largest health insurance programs in the world, JKN represents a huge opportunity to redirect provider behaviors using financial incentives.

- Vertical government financing flows. These are complex but needed to support increased ambition across the whole program, provide public health functions, finance the HR needed to reach out to the public sector, and to socialize the proposed changes in practice that will be nudged by the JKN financial incentives.

a. **Findings**

We found that the level of funding of the program is reasonable for the current level of activities, but given the revised prevalence level, program funding will need to be increased several-fold to reach full coverage and treatment. In addition, TB is heavily reliant on donor funding (especially the Global Fund), some of which comes to an end in 2020. The funding effort required from domestic sources for coming years is therefore substantial, in the order of US$ 250 million per year. This can be justified based on an estimated economic cost from TB of US$ 9.8 billion in 2015 using the revised prevalence estimates, and the cost effectiveness of TB care and treatment (Figure 12).

**Figure 12. Comparative Cost and Benefit of TB Treatment, per General Case (not including MDR cases)**

*Source: MSH, 2013 (The Economic Burden of Tuberculosis in Indonesia. USAID)*

At the end of 2016, 66% of Indonesia’s population was enrolled in JKN. JKN capitation payments to the *puskesmas* go 70% to services (staff fee, additional to district salary) and 30% to operations. Currently, a pilot is ongoing in selected urban areas for a JKN pay-for-performance component at PHC, which has 3 indicators: the number of patient consultations; ratio of referrals to consultations (must be low); and intensity of diabetes and hypertension preventive/promotive activities in elderly clients. The results are yet to be seen.
GP empanelment by BPJS, as JKN providers, is also progressing rapidly, and JKN is attractive to GPs as it draws in clients. The composition of empaneled providers at primary level is 50:50 public and private. All PHC providers (public and private) report the ICD-10 codes of their clients through the PCARE electronic system, and through a more complete paper system. From this, the BPJS reports the top 10 codes to the DHO and PHO, and TB is typically in the top 5.

In the area of vertical financing, it is critical to address TB planning and budgeting at the district level, for two reasons:

- this is where the majority of health money is budgeted and spent.
- the 10% allocation of district funds to health is based on law - although there is no penalty if it is lower than 10% - so advocacy and planning at district level is critical.

The NTP fully appreciates the importance of mobilizing domestic TB financing at the district level, and developed guidance for district TB planning – since there is a sense that money is available if a valid plan is developed. Fifteen provinces were trained in three day meetings with districts. Challenge TB is following-up with a more intensive process in 16 districts. Based on these lessons, provinces will be asked to guide TB planning and budgeting at the district level.

There are specific opportunities within this landscape: e.g., from 2015 to 2016, special allocation funds (DAK) for health increased 4-fold and village development funding tripled. The NSP includes estimates of resource needs, and projects a doubling of TB resources including large jumps in funding from the central government budget, APBN and the local government budget, APBD.

There is some basis for performance-based compensation in the public sector, but we found few examples of this being used for TB, and did not look at this topic in depth. At one site, performance incentives for smears had resulted in data falsification.

b. **Challenges**

**JKN**

The introduction of an insurance scheme as large and ambitious as JKN would be expected to bring major challenges and needs for adjustments along the way. Approximately 36% of the population remains uncovered by JKN, and thus remains more susceptible to out of pocket costs; others are left out due to the challenges noted above. JKN is currently underfunded relative to its ambitious goals, has run deficits, and funding needs are increasing faster than revenue.

For TB, one of the biggest problems is that too much TB treatment is happening in hospitals (Figure 13a). Since up-referral is expensive, BPJS is trying to discourage it (see the pay-for-performance indicator above), and officially compensates hospitals only for treatment of complicated TB. But the outcome of these efforts is not yet clear. The high level of hospital-based care (48% of all TB treatment as per the prevalence survey) is a particular problem for TB, since hospitals are generally poor at monitoring adherence, the longer travel to hospitals puts a greater burden on patients, and treatment outcomes from hospitals are consistently lower (at around 60% rather than the 85% seen in PHC).
Some of this is driven by patient preferences – patients like being seen by specialists, who give more individualized care such as dose adjustments and treatments for side-effects, and patients may be willing to pay out of pocket for this. But it is exacerbated by the current financial arrangements. GP clients are sent to the puskesmas for a smear, where their capitation could be “stolen” by the puskesmas. Then many GP and puskesmas clients are referred up for a chest X-ray, after a negative smear, and may never return. There may be an allowance for puskemas or hospitals to be compensated for a diagnostics service, but this fee comes out of the PHC capitation, thus acting as a disincentive to the PHC level. In other hospitals, patients are asked to pay out-of-pocket for a test, as the hospitals cannot submit a claim just for a diagnostic test. The current TB JKN guidance is a good first step but lacks all of the necessary who/where/how detail of such steps, and doesn’t consider the financial and other incentives influencing providers and clients.

With the funding fragmentation and overlap, there is a lack of clarity on how the 30% from capitation can be used, with some health staff believing this cannot be used for TB, since NTP already covers TB. This money can go unspent due to lack of time and skills in planning, and little is known about how it is used. But it represents an opportunity.
Vertical financing flows

Existing plans (national and district-level) are mostly at the strategic level, and lack implementation and costing details for scaling up and addressing the unknown cases. At the central level, the political and logistical feasibility of the future funding projections (particularly the jumps in APBN and APBD) have not been assessed.

The JEMM team observed that local TB budgets from domestic financing seemed minimal, and more focused on staffing and infrastructure than activities. Indeed, the vast majority of the activity budget was coming from Global Fund. But this could not be assessed systematically, as sub-national level expenditure information was not generally available, due in part to the complexity of the flows and inconsistency in coding the spending categories. There have been challenges with absorption of Global Fund money in provinces.

The fragmented funding channels under APBN and APBD create challenges for district planning, as each source varies in terms of limitations, flexibility, and stability of any attached priorities over time. For example, the most flexible is the “non physical” DAK special allocation (formerly termed BOK Health Operational Costs), but this can be unstable in the face of changing government priorities. Another source, DEKON, flows through MoH (unlike the others), and therefore might be more easily shaped by MoH priorities. But it is more for capacity building and flows only down to province level. There are some preliminary efforts by national authorities to be more directive in district planning, such as an attempt last year to use mandatory DAK (for certain types of infrastructure and supplies) to direct funding to national priorities, and the piloting this year of proposal-based non-physical DAK. TB, or at least health, could potentially find a place in these efforts. Finally, village funding is under community control; in theory, this could be well suited to the financing of community health workers, but it tends to be used more for infrastructure. So far, the draft guidance on village funds focuses on a list of things that cannot be supported by village funds, rather than encouraging particular types of expenditures.

Health sector and program governance is also very fragmented, with responsibilities split among four levels of administration (national, provincial, district and village) and institutions (various ministries in government, private organizations, donors, community organizations), with weak coordination mechanisms. Furthermore, accountability mechanisms are weak, with limited supervision and performance focus. Stronger joint planning and budgeting across levels of government or comprehensive performance-based payment mechanisms could mitigate these effects.

The presence of TB in the SPM (Minimum Service Standards) should be an opportunity to drive greater local investment in TB efforts, since non-achievement of SPM can be a reputational risk for local politicians. However, the current draft text for the TB standard focuses more on non-measurable standards of care than quantitative, measurable results. The one quantitative indicator is similar to a case detection rate (CDR). But the current wording is unclear and, if it is CDR, the target of 80% will routinely not be met since the baseline is 33%, thus making the standard irrelevant to policy makers.

NTP is aware that they can leverage resources for TB by working with other ministries on what they can do for TB control. A meeting during the JEMM at BAPPENAS, with numerous other
ministries, indicated a strong willingness of these ministries to contribute, but the NTP needs to reach out with specific requests and plans.

External funding is ~1% of health funding overall, but >50% for TB – so there is a clear need to start the transition to more domestic financing for TB.

c. Recommendations

Financial levers are desperately needed to influence provider behavior, since direct regulation of providers and facilities is currently a weak lever (see regulatory section). First, it is critical to use the opportunity of JKN to better shape provider and client behaviors and flows, such that more private providers can contribute to quality-assured TB diagnosis and treatment, and more TB treatment can be redirected to the primary care level rather than hospitals. Second, a concerted effort at domestic resource mobilization is needed to raise the money necessary for more ambitious TB control across the board, and in particular to engage the large private sector. These recommendations correspond to #1 and #3 of the 5 recommendations in the overall JEMM Executive Summary, with #3 providing many of the resources necessary for implementing recommendation #2.

At the national level, a broad discussion is needed in the health sector on two topics: (i) how to channel funding to public health vs curative activities (especially as pooled funding under JKN becomes more dominant), and (ii) whether national priorities should be promoted primarily by earmarking certain funds for a priority topic, or by monitoring of and feedback on results.

JKN

The MoH and NTP should:

1. Analyse existing BPJS data to improve MoH’s understanding of the diagnostic, treatment and referral practices by current providers, and estimate the possible financial and outcome impacts if certain incentives and penalties (see (b) below) are changed. Such analyses are already planned under World Bank stewardship, using the multi-donor trust fund (MDTF). Once BPJS, P2JK and DJSN have considered these data, piloted implementation, with variants, would be a practical first step to check the unintended and real-world effects, prior to wider implementation.

2. Based on the analysis in (1.), make full use of JKN to create incentives to encourage appropriate diagnosis, notification and care at public and private primary care level (Figure 13). The interventions may include:

i. Add a payment for TB case notification (and/or for completion of TB-related public health functions) to the non-capitation element of primary care payment (alongside delivery, ANC/PNC and family planning);

ii. Encourage high TB case notification, and reward TB training, using the capitation performance-adjustment formulae;

iii. Revise hospital tariffs to encourage down-referral and facilitate better monitoring of hospital behaviour;

iv. Rather than moving capitation during the diagnostic process, compensate puskesmas and hospitals for providing specific TB diagnostic services (smear microscopy, and
Xpert and chest Xray (CXR), respectively) ordered by puskesmas and private PHC providers. These schemes should replace any current out-of-pocket costs for these services.

3. **Ensure access to health insurance for the very poor and near poor and people with inadequate documentation.**

4. **Revise the TB JKN guidance to describe every step and incentive that guide collaborations between GPs and puskesmas (e.g., GPs can refer for diagnosis; puskesmas does smear and reporting; GP monitors treatment) and between PHCs and hospitals (hospitals provide chest Xray and smear negative diagnosis for PHC, but do not keep uncomplicated patients). The revised guidance should have more detail on how financial and behavioral incentives can encourage these practices.**

**Vertical financing flows**

5. **The MoH and NTP should at least double current funding and mobilize the human resources necessary for full implementation of the NSP, 2016-2020. For the financial aspects of this recommendation, the MoH and NTP should:**

   i. Advocate for increased TB funding, using the estimated societal benefit of 40 rupiah for each rupiah spent on the program;

   ii. To address fragmentation and facilitate financial management, consider pooling health funds at district level, which then allocate to facilities; this is unlikely to be feasible for the TB program alone, but should be considered for health financing generally;

   iii. Improve the draft SPM language for TB, ensuring that the target is quantitative, clear, and ambitious but achievable;

   iv. In cooperation with the World Bank and partners (WHO and KNCV), finalize the detailed costing of all activities in NSP 2016-2020;

   v. With the assistance of the World Bank MDTF, pilot the tracking of sub national level expenditure data on TB, and develop a fiscal analysis (a thorough costing study to reliably estimate current and future funding needs for TB) and assessment of the opportunities for districts to:

      a. Get more total APBN/APBD budget based on good planning or performance

      b. Get a greater percentage of that budget allocated to health

      c. Get a greater percentage of that health budget allocated to TB

      d. Get a greater percentage of that TB budget allocated to TB activities

   vi. Disseminate and implement guidance on the development of district action plans for TB control – including how to develop strategies, activities, and budgets; guidance based on the fiscal analysis noted above to identify funding needs and targets; how to incorporate TB-related performance-based indicators in these financing flows; and defining the actions necessary to meet the Minimum Service Standard (SPM) for TB;

   vii. Work with BAPPENAS to make detailed agreements with related ministries and units on their collaboration in TB control, with clear responsibilities, deliverables, targets and timelines;
viii. Provide guidance for the puskemas level on how to plan for and use the 30% capitation for TB-related activities, and opportunities to advocate for TB-related uses of village funds;

ix. Assess the possibility of developing a results-based financing mechanism related to TB, including strong accountability mechanisms through appropriate pay-for-performance and strengthened supervision, coordination and M&E.

5. Human Resource Development

Human Resource Development (HRD) for comprehensive TB prevention and care services aims to get “the right people, in the right numbers, with the right skills, motivation and support, in the right place, at the right time”. HRD for the NSP for TB control, 2015-2019 includes the planning, managing, and supporting the health workforce for the delivery of TB prevention and care services. This has to be done within overall health workforce development and taking into account recent initiatives to strengthen health service delivery which have promulgated a number of laws and decrees.

The key issues and challenges related to capacity building, staffing, supervision and motivation are well known to the NTP since they have been highlighted in previous JEMMs, and are well outlined in the background document to this JEMM. Some progress has been made on implementing the recommendations on HRD made by the previous JEMM. However, many of those recommendations are of a long term nature and remain valid.

a. Findings

The National Strategic Plan for TB Control 2016-2020 includes two strategies related to HRD aimed at strengthening leadership in the TB programme at district level: the development of guidelines for the District Action Plan, and strengthening human resources. The Strategic Plan of the Ministry of Health (MoH) 2015-2019, aims to improve human resources at puskemas and district hospital levels (Table 2).

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>BASELINE 2013</th>
<th>TARGET 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Puskesmas with minimum 5 types of health officers</td>
<td>1,015</td>
<td>5,600</td>
</tr>
<tr>
<td>Percentage of District Class C hospitals that have 7 specialized medical doctors</td>
<td>25</td>
<td>60</td>
</tr>
</tbody>
</table>

Table 2.
HR Indicators in the Ministry of Health Strategic Plan 2015-2019

12 These include BPJS, P2JK (who provide technical guidance to BPJS), the Coordinating Ministry of Human Development and Culture (who promote national priorities and chair the Social Security Board (DJSN), which governs, JKN), the Ministry of Finance (which governs most of the flows of health money), the Ministry of Internal Affairs (who sets the guidance for district-level planning including the Minimum Service Standards (SPM)), the Ministry of Village Development (which guides the use of village funds), Pusdatin (responsible for HMIS infrastructure in MoH), and the Ministry of Law and Human Rights (prisons).

13 MoH. TB NSP 2016-2020, pages 2-3
The HR targets outlined in table 2 are part of the MoH’s plans to increase the ratio of health care workers per 100,000 population. Meeting the targets for 2019 would bring the workforce density (doctors, nurses and midwives) from 1.47/1,000 to 3.45 and thereby exceed the critical minimum level of 2.28 established by WHO (World Health Report 2016) below which high coverage of essential interventions is very unlikely (Table 3).

Table 3. Planned Increases in the Health Workforce Density

<table>
<thead>
<tr>
<th>TYPE OF HEALTH CARE WORKER</th>
<th>RATIO PER 100,000 2015</th>
<th>TARGET PER 100,000 BY 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctor</td>
<td>16.06</td>
<td>45</td>
</tr>
<tr>
<td>Nurse</td>
<td>87.85</td>
<td>180</td>
</tr>
<tr>
<td>Midwife</td>
<td>43.74</td>
<td>120</td>
</tr>
</tbody>
</table>

Achievements in staffing

1. The review teams met many motivated and dedicated health staff doing a good job.
2. Within the Healthy Family Initiative, some districts – with village funds (GEMARI) - have assigned a nurse/midwife for every village, tasked to find presumptive TB patients.
3. Some provinces have a number of wasors at provincial level, e.g. 7 persons at the provincial level, 5 full-time, including for PMDT, M&E, TB/HIV, provincial training coordinator (PTC).
4. In some provinces there is a strong involvement of professional associations (Paediatricians, Pulmonologist) in capacity building.

Achievements in training

1. PTC and provincial training teams (PPT) are in place in most provinces.
2. Training is done as funds become available (including from local govt budget).
3. Many training activities for specific technical areas have been organized (e.g. TB MDR, SITT, drug management, laboratory, including GeneXpert).
4. Strong collaboration with the Board for Development and Empowerment of Health Human Resources (BPPSDM) accreditation of trainings, support to PTTs and development and piloting of an e-learning system (in collaboration with Indonesian Medical Association).
5. Training and sensitization of community and treatment supporter has been undertaken by Aisyiyah.

b. Challenges

While some progress on HRD has been noted, many challenges remain. The management of HRD varies a lot between the provinces. In general provinces have developed training plans based on available funding mostly from the Global Fund (GF), but also from local funding. However, comprehensive HRD plans based on all HRD needs for TB care services in the
respective province, including collaboration with hospitals, the private sector, laboratories and NGOs, and linking HRD to supervision are not available. Minimum standards for the number of staff to be trained in each facility were developed a number of years ago, and based on these minimum standards many provinces report a high “training coverage”. However, staff numbers exceed these minimums thus giving an over-optimistic picture. Staff trained in hospitals and the private sectors are not included.

The overall low staffing density of health services at peripheral al level in Indonesia makes increase in scope and quality of TB services delivery a major challenge.

Challenges in staffing

1. There is insufficient staffing at all levels (including central level NTP) to ensure the full implementation of the NSP 2016-2020.

2. Provincial and district wasors are often responsible for more than one programme and thus cannot manage increasingly complex TB programme interventions.

3. Staff are often demotivated because of heavy workloads, lack of supportive supervision/mentoring, complex and challenging tools (e.g. SITT), or lack of appropriate tools (e.g. computers).

4. There is a high turnover among trained staff due to rotation policies, promotion and TB being considered as undesirable work.

5. Vacant positions, especially among doctors at Puskesmas level are filled by contracted doctors, often on short term contracts (as short as 3 months) which seriously hampers capacity building.

6. There is a lack of retention schemes to keep staff in remote areas (and increase motivation).

7. Puskesmas chiefs don’t consider a trained TB officer a standard – thus TB is often “abandoned” when no staff is trained or trained staff is moved. The NTP standard, for almost 15 years, has been that one doctor and one nurse should be trained by the NTP in TB.

Challenges in training

1. There is sub-optimal leadership, managerial and technical capacity, including supervisory capacity of the NTP at provincial and district levels, for implementing the NSP 2016-2020. E.g.:
   - Insufficient flow of information from provincial level to district and puskesmas;
   - Insufficient regular, high quality supervision at all levels with capacity for data analysis and overall mentoring;
   - Inappropriate target setting for new sputum smear positive at all levels (which excludes the attention to all other forms of TB);
   - Implementation and use of new recording and reporting system;
• Preparation of comprehensive training plans (In general provinces have training plans based on available funding (GF) but not comprehensive HRD plans based on all HRD needs in the respective province, including linkages to supervision).

2. There is insufficient ongoing training for the implementation of all components of the NSP 2016-2020 and current unmet training needs (limited skills) in technical areas: R&R including SITT, TB/HIV, counseling, IC, pediatrics and pharmacy, laboratory including GeneXpert and supervisory skills as well as overall leadership, programme planning and management and training in particular at provincial and district level.

3. There is a Back log of untrained staff at Puskesmas in “initial DOTS” (Table 4).

4. There are unmet training needs for staff in hospitals; private providers and contractual staff.

5. Training needs are increasing for the implementation of the PMDT expansion plan PMDT (including improving the performance of existing staff in basic TB control).

6. There is limited funding for training from local budget.

7. There is no continuous training/education/advanced training for staff already trained in basic DOTS. Many staffs already trained were trained 10-15 years ago.

8. Suboptimal functioning of training teams at provincial level, including lack of collaboration with provincial training institutions and lack of preparation of HRD plans. Training is not followed up during supervision.

9. Insufficient continuing capacity development of the PTT members (technical and managerial).

In conclusion, the implementation of the JKN will require major efforts and resources for HRD to ensure that:

• There are enough staff at all levels in the public sector (overall workforce density and TB specific);
• The private sector is competent and responsive with regards to TB services;
• Health workers (in the public and private sector) are competent to perform the assigned tasks (related to TB prevention and care) based on job descriptions;
• Staff are motivated to use their skills as intended.
c. **Recommendations**

1. **The MoH should:**
   
   a. Ensure that the long term staffing needs for the implementation of all components of the NSP and beyond are met, and reflected in long term development plans for human resources for health in Indonesia at central, provincial and district levels. This includes the urgent need for additional posts to be established at all levels;
   
   b. Ensure the continued close collaboration and coordination between the Board for Development and Empowerment of Health Human Resources (Badan PPSDM) and the Directorate General Prevention and Disease Control on all aspects of human resource development for TB control.

2. **To improve planning and staffing, the NTP should:**
   
   a. Update detailed annual plans/workplans at all levels to ensure the necessary HRD support. This should be needs-based plans and not just plans for use of GF resources – see also training recommendations. These plans should be the basis for fund raising and incorporation in broader health sector plans;
   
   b. Continuously advocate to decision makers at all levels to increase commitment for sufficient human and financial resources;
   
   c. Ensure on-going technical assistance to further strengthen the strategic development of HRD;
   
   d. Continue to further strengthen the collaboration between relevant departments in the Ministry of Health (BPPSDM, Personnel) and provincial and district authorities to:
      
      i. ensure adequate staffing at all levels and that trained staff is maintained in their positions (decrease staff turnover);
      
      ii. ensure that TB is well represented in different HRH strengthening initiatives;
      
      iii. review possibilities for TB to contribute to overall incentive systems (monetary and other) for remote area assignments;
      
      iv. Contract additional staff at central, provincial and district level to enable adequate programme performance including scaling up (central and local budget).
   
   e. Strengthen the regular monitoring of staff turnover (biannually) to identify new staff that needs training (provincial and district wasors). This should be done during regular supervision and not just during Monitoring and Evaluation meetings;
   
   f. Revise the “TB staffing standard” based on the new NSP 2016-2020 that is the basis for assessing training needs. All staff involved in TB control at all levels should be trained based on their job descriptions.

3. **To improve training, the NTP should:**
   
   a. Urgently initiate a complete “overhaul” of the existing training material and training programmes, to ensure up to date, comprehensive training of staff at all facilities, public and private, at provincial, district and puskesmas level, including laboratories. This includes; a comprehensive task analysis (based on work already undertaken); update the training material based on the task analysis; develop new material as needed ; train the PTT in the new module; provide support to PTTs to develop and implement training plans using the new modules;
   
   b. Ensure that the work on updating of the training material is done in collaboration with the Centre for Training of Human Resources for Health (PP-SDMK) under the BPPSDM;
c. Ensure collaboration with and support to NGOs in their development of training material;
d. Continue to strengthen the Provincial Training Teams (PTT), technically and managerially, further strengthen the linkage to provincial training institutions. This includes annual continuing education activities;
e. Strengthen collaboration with Indonesia Medical Association (IDI) and other professional organizations (PAPDI, IDAI, PDPI) for training of private providers at all levels;
f. Further enhance awareness and skills of staff at central level through participation in international meetings, workshops and training courses and on-going subject specific workshops in-country including language trainings;
g. Strengthen collaboration with relevant departments for updating of basic training curricula in medical and nursing schools and schools for basic training of laboratory technicians.

4. To improve staffing and training, provinces and districts should:

a. Update detailed annual plans/workplans to ensure the necessary HRD support for the implementation of all the components of the NSP 2016-2020. These should be needs based plans (see 2a. above);
b. Follow up on newly trained staff by post-training evaluation and mentoring during supervision and make better use of supervisory visits for continuing on the job training, especially for staff that has not yet attended a TB training course relevant to their job descriptions;
c. Continuously pursue advocacy to decision makers at local governments to acquire and increase commitment to ensure availability of human and financial resources for HRD implementation;
d. Strengthen collaboration with provincial IMA for training/updating of private providers;
e. Strengthen collaboration with hospital directors for continuing education on TB for staff in hospitals;
f. Organize annual continuing education activities for members of the PTT;
g. Strengthen collaboration and coordination between PTC, provincial/district HR responsible units and provincial training institutions;
h. Further strengthen HRD for the implementation of all components of the NSP (initial TB training, continuing training, training on new issues e.g. TB-HIV, MDR-TB, IC, management) through:
   i. Developing a system for mandatory TB briefing for doctors contracted at Puskesmas level;
   ii. The use of regular M&E meetings for ongoing capacity building;
   iii. Revision of criteria for selection of TB officers at Puskesmas level for training;
   iv. Discontinuing internal rotation of responsibilities at Puskesmas level;
   v. Ensure job description on HR in TB are available for all staff in all levels, including how to supervise and coordinate with the head of the Puskesmas;
   vi. Organizing scientific workshops about TB, childhood TB and TB co-morbidity for GPs, pediatricians, and internists and involving professional organizations (IMA, pediatrician organization, Pulmonologist and internist organization);
   vii. Developing “motivation and acknowledgement” system (non-financial).
6. PPM

a. Findings

The NTP has engaged 75% of public hospitals (668/886), as well as almost all puskesmas\textsuperscript{14} in TB activities. Indonesia also has a large and growing private healthcare sector, including 24,716 pharmacies, 8,615 licensed drug shops and more than 1,500 private hospitals\textsuperscript{15}. There are 110,000 registered GPs, although the number actively practicing is much lower\textsuperscript{16}; many are also employed in government service and practice privately only part-time\textsuperscript{17}. The numbers of private hospitals groups and general group practices have doubled in four years. The number of private laboratories is not known.

Private healthcare providers (including pharmacies) accounted for 74% of the initial care-seeking behaviour of people with TB in Indonesia but only 30% of TB diagnoses (Table 5)\textsuperscript{18}. Sales of anti-TB drugs in the private market in 2009 were estimated to be sufficient to treat 500,000 cases\textsuperscript{19}. Private clinics and hospitals manage 42% of TB treatment but contributed only 9% of total case notifications to the NTP in 2015. Of these, 26,457 (8% of the total) were notified by private hospitals and only 4,003 (1% of the total) were notified by private GPs: 63% of these private GP notifications came from just 3 provinces (DKI Jakarta, Aceh and Sumatera Utara) and 17 provinces reported less than 10 notifications by private GPs. In 2015, 464 private hospitals notified an average of 57 cases each\textsuperscript{20}, while 87 private GPs notified an average of 46 cases each (with a very wide range).

Table 5.
Private Primary Care Facilities and Hospitals in Indonesia and Their Role in TB Care

<table>
<thead>
<tr>
<th>TYPE</th>
<th>NUMBER OF FACILITIES/PROVIDERS:</th>
<th>PROPORTION OF:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TOTAL</td>
<td>Contracted by JKN</td>
</tr>
<tr>
<td>Private</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pharmacies</td>
<td>24,716</td>
<td></td>
</tr>
<tr>
<td>Individual GP</td>
<td>70,000</td>
<td>4,588</td>
</tr>
<tr>
<td>Group GP</td>
<td>5,183</td>
<td></td>
</tr>
<tr>
<td>Hospital</td>
<td>1,538</td>
<td>1,049</td>
</tr>
<tr>
<td>Subtotal</td>
<td>10,830</td>
<td>331</td>
</tr>
<tr>
<td>Public</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Puskesmas</td>
<td>10,100</td>
<td>9,813</td>
</tr>
<tr>
<td>Hospital</td>
<td>955</td>
<td>900</td>
</tr>
<tr>
<td>Total</td>
<td>10,713</td>
<td>9,743</td>
</tr>
</tbody>
</table>

Total from Indonesia Health Profile 2016, estimating proportion of 110,000 registered GPs who are active. JKN data from BJPS. Number of providers notifying, and proportion of notified cases, from SITT. Location of initial care-seeking, diagnosis and treatment from Patient Pathway Analysis, referencing 2013 National Prevalence Survey and 2010 RISKESDAS Basic Health Survey.
While data is scarce, it is likely that the quality of TB care in the private sector is very poor. One survey of 547 GPs in 8 cities in 2011 found that only 10% had been properly trained in TB, less than half used smear microscopy for TB diagnosis, only 28% followed the NTP regimen and 9% prescribed 2nd line drugs\(^21\). An earlier study had also found that most private providers (72.7%) who treated TB patients did not prescribe the NTP standard regimen\(^22\). The treatment success rate at puskesmas is reported to be significantly higher than in the private sector, and GPs and hospitals typically do not have mechanisms for preventing loss to follow-up.

Consequences of failure to engage private providers on a scale commensurate with their role in care-seeking include low case notification, treatment delays, sustained transmission, incomplete regimens, probably leading to increased multi-drug resistant TB, catastrophic expenses and impoverishment.

**Efforts to engage private providers**

The importance of engaging private providers has been recognized in national TB plans since at least 2006. For the 2016-20 NSP, “improvement of networking TB services through public-private mix” is one of the main activities under Strategy 2: improving the quality of “TOSS-TB” services. Planned activities include developing technical guidance for district-based PPM, mapping service providers, signing MOU and working with professional societies. Indicator 2.1 is “% of districts/municipalities with at least 80% of health services involved in PPM”, which is to increase from 10% in 2016 to 90% in 2020. This performance indicator is very poorly defined. The NSP includes estimates of funding requirements for each of 6 major strategies, but there is no indication of any budget for engaging private providers.

Efforts to engage private providers have focused to-date on specialists and hospitals, where the numbers of patients per provider or facility tend to be higher than at the primary care level. The Pulmonologist Society, PDPI, has been working with the NTP since 2010 to improve involvement of pulmonologists and increase adherence to ISTC/PNPK, in partnership with the American Thoracic Society (ATS) and with funding from USAID and GFATM\(^23\). This has been a high yield intervention but thus far has typically stopped with the specialists, rather than using the specialists to reach large numbers of GPs.

There have been very few efforts to engage private primary care providers. A $1 million TB REACH/Unitaid project, implemented by REMDEC in DKI Jakarta from 2013 to 2016, intended to engage private GPs and introduce GenXpert, but could not be implemented as planned and had high pre-treatment loss to follow-up (>50%).

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\(^{14}\) Ministry of Health, Republic of Indonesia, 2017. “Tuberculosis Control Program in Indonesia”. p. 25

\(^{15}\) Ibid. p. 11

\(^{16}\) Mahendradhata (2015) selected 1,024 in 8 cities for a survey but was able to locate 751 (73%) and interviewed only 608 (59%) after excluding specialists, retirees and others.

\(^{17}\) 70% of doctors in government service have private practice. Uplekar M. et al (2003) PPM DOTS in Indonesia: A strategy for action (WHO)

\(^{18}\) Patient Pathways Analysis, Jan 2017


\(^{20}\) The NTP reports engagement with 362 private hospitals, yet 464 private hospitals notified cases in 2015 alone.


\(^{23}\) The role of private-practiced pulmonologists in the activities of PPM; ATS/PDPI/CTB
Since 2014 there has been an initiative to certify GPs for TB. In order to be certified, GPs must participate in either a 5-day training organized by the provincial or district health office, or a lengthy online course that was established by the IDI, but for which there is currently no budget (for online mentoring or site maintenance). Once trained, GPs would be evaluated over a 6-month period by their District Health Office (DHO). The DHO would then recommend the GP for certification to the Province, which would pass on the recommendation to the national level, where the IDI would issue the certification. Unsurprisingly, 35 GPs have been certified to-date. While TB certification may be one way to earn the points necessary for renewal of registration, there are many others. It hardly seems reasonable to make private GP participation in JKN or other schemes conditional on TB certification, given that they are already fully qualified to practice medicine, the capacity to conduct the trainings does not currently exist, and when only 47% of puskesmas doctors are trained in TB.

**The role of JKN in private provider engagement for TB**

The JKN covers nearly 173 million people, or 67% of the population, and is supposed to cover 100% of the population by 2019. In theory, TB care is free to JKN members and readily available at public and private primary care clinics and hospitals. BPJS has contracted over 1,000 private hospitals as secondary/tertiary facilities (FKRTL) and 9,781 private GPs/GP clinics as primary care providers (FKTP). Members are free to change their primary care provider every 3 months and must be referred by their primary care provider for hospital services. The number of private GPs and group practices registered with JKN has increased by more than 50% in the last 2-3 years, with the biggest increase amongst group practices. Primary care providers reportedly derive most of their JKN income from capitation payments. The standard capitation rates are adjusted according to performance in three areas: contact rate; non-specialist referral rate, and chronic disease management. Non-capitation payments are also made for specific maternal and child health services, but there is no such system for TB. Information on the number of members assigned to different types of primary care provider, and the average amount of capitation and non-capitation payments to different types of provider, was not made available to the mission. BPJS plans to move towards a situation in which each puskesmas has around 30,000 members, each private group practice around 15,000 members, and each independent GP around 5,000 members.

The NTP and BJPS collaborated to produce “Technical guidance on TB Care for Participants in JKN” in 2015. This document describes how JKN members may be referred from private primary care providers to puskesmas for smear microscopy, and how uncomplicated cases may be managed at public and private primary care providers.

Primary care (FKTP) providers report all visits, including TB-related visits, to BJPS, but data on the number of such visits was not made available. Data on TB-related patients and claims in the hospitals (FKRTL) system are available for 2014. In that year, BJPS/JKN hospitals reported 287,661 outpatient TB visits and 89,458 inpatient TB cases, being reimbursed $5m

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24 National Health Insurance Scheme for TB and HIV AIDS, presentation by MoH Center for Health Financing and Health Insurance, 23 January 2017

25 INR 3k-6k ($0.22-$0.44) per member per month for puskesmas (for whom salaries and other costs are covered separately) and INR 8k-10k ($0.60 - $0.75) per member per month for private GPs

26 INR 700,000 (US$52) for a normal delivery, INR 50,000 (US$3.75) per ANC/PNC visit, INR 15,000 (US$1.12) per IUD or implant
and $50m respectively (approximately $17 per outpatient and $560 per inpatient). It is not clear how many of the OP patients were also included in the IP data, or how many of these patients are included in the NTP case notification system. Hospitals may claim for TB case management under any of several different INA-CBG codes, so the accuracy of this data is not known.

While the technical guidance is sound, BJPS/JKN payment systems do not encourage case finding or case management at the primary care level. Primary care providers receive a capitation payment, with no performance-based incentive for referring suspects or notifying cases. While private primary care providers are sometimes able to refer suspects to their local puskesmas for sputum microscopy as designed, others are thought to be reluctant to do so for fear of losing their registered members (See TB financing challenges, Section 4 and Figure 13). There is provision for “partial referral” for diagnosis only, but the referring primary care provider is then expected to pay for the diagnosis from the capitation funds. When they refer patients to hospitals for chest x-rays, the hospitals tend to keep even uncomplicated cases, rather than refer them back to their primary care provider after diagnosis, and to charge the patients directly (patients may also prefer to be managed by a hospital)\textsuperscript{27}.

**Main achievements since 2013**

i. Engagement of private hospitals by the NTP in TB activities has continued with moderate success: 464 private hospitals (30% of the total) notified 26,457 cases (8% of the total), an average of 57 each;

ii. The Indonesia Pharmacies Association (IAI) in Jogjakarta has reportedly succeeded in persuading its members to stop sales of anti-TB drugs without a prescription (although this could not be verified by the mission). Draft guidance for pharmacies has been prepared;

iii. Isolated instances of good collaboration between puskesmas and local private GPs can be found\textsuperscript{28}. Although they are neither systematic nor scaled up, they demonstrate that good public-private partnership at the primary care level is possible in Indonesia;

iv. The NTP reports that 52 districts have established PPM teams, although it is not clear in what ways they are active, and such teams seem unlikely to provide the organizational structure or manpower necessary to engage large numbers of providers;

v. Long-running efforts to back up legislation with a decree on mandatory case notification have reached a successful conclusion, and an app to make notification easier is in development;

vi. The 2013 National Prevalence Survey provided compelling evidence on the importance of the private health sector in TB care and early treatment-seeking behaviors;

vii. Several efforts have been initiated that will soon strengthen the evidence base regarding the private health sector and its role in TB. Notably, within 2017, inventory studies have

\textsuperscript{27} USAID July 2016 review of private sector TB

\textsuperscript{28} The JEMM team visited Puskesmas Andalas, in Padang, West Sumatra, where district and Puskesmas staff have developed a simple and practical model of collaboration with 8 private clinics that contributed 42% of case finding
mapped public and private providers in 23 districts and will provide estimates of actual TB case load; KNCV has mapped providers in Bandung and is analyzing survey data on provider training and practices in TB; and the World Bank has begun a Quantitative Service Delivery Survey (QSDS), including public and private providers, to assess supply-side readiness in the context of JKN expansion.

b. Challenges

i. The private primary care sector is large and fragmented and unlikely to respond substantially to traditional regulatory approaches;

ii. With very little capacity (staff or skills) for private sector engagement at any level, the NTP has understandably focused on high-volume hospitals and relied on external funding and professional associations to do the work;

iii. In the National Strategic Plan 2016-2020, targets and approaches for private sector engagement are weak, and this area does not seem to have any dedicated budget;

iv. The TB program does not seem to have the capacity to engage with BJPS sufficiently to ensure that technical guidance is reflected in payment systems;

v. Under-developed health management information systems make it difficult to either understand the role of private providers in TB care or to encourage correct reporting and recording by them;

vi. The few efforts to-date to engage private providers have been externally funded (by USAID, TB REACH or GFATM), which suggests a lack of real prioritization and raises concerns for the sustainability of any initiative.

Summary of opportunities

i. Indonesia leads the world in scaling up a single-payer social health insurance system. This creates a powerful opportunity to transcend isolated good practices and small, unsustained pilot projects by engaging with private providers in a way that is systematic, to scale and sustained[29]. It is especially important for engaging the large, fragmented private primary care sector, which is critical not only for case finding and management but also for early initiation of treatment and therefore interruption of transmission;

ii. Resources from the GFATM (including catalytic funding) are available to support major urban PPM initiatives that can capitalize on changes in JKN to accelerate the consolidation of PPM networks in urban districts, establishing patterns of behavior and systems that can hopefully be sustained beyond the GFATM funding period;

iii. Trends towards consolidation in Indonesia’s large and dynamic private healthcare sector (GP group practices, chains of pharmacies and laboratories) are likely to facilitate effective engagement by public sector leaders who understand new ways of working in an environment of mixed health systems for universal coverage.

c. Recommendations

1. In order to increase case finding, notifications and access to care, the JEMM strongly advises the MoH to drive massive engagement of private providers (and shift treatment of uncomplicated cases from hospitals to the primary care level) by adjusting payment mechanisms in both primary (FKTP) and hospital (FKRTL) systems of JKN. This would capitalize on the extraordinary opportunity created by expansion of JKN to transform TB control in Indonesia. Specifically, the MoH and NTP should:

   a. Make full use of JKN to create incentives to encourage appropriate diagnosis, notification and care at private primary care level. Conduct rapid experiments with different incentives and adjust them accordingly. Possibilities include:
      - Add a payment for TB case notification to the non-capitation element of primary care payment (alongside delivery, ANC/PNC and family planning);
      - Encourage high TB case notification, and reward TB training, using the capitation performance-adjustment formulae;
      - Revise hospital tariffs to encourage down-referral of uncomplicated TB cases and facilitate better monitoring of hospital behaviour;
      - Compensate puskesmas and hospitals for providing specific TB diagnostic services (smear microscopy, Xpert, and chest X-ray (CXR)) ordered by puskesmas (CXR) and private PHC providers (smear microscopy, Xpert and CXR).

   b. Make optimal use of mandatory notification, accreditation and continuous medical education for professionals to ensure the quality of TB care funded by health insurance.

2. The JEMM strongly advises the MoH to greatly increase the public sector focus on engaging all care providers and civil society, including:

   a. Verify and understand recent IAI initiative in Jogjakarta that apparently succeeded in persuading private pharmacies not to sell anti-TB drugs without prescription, and explore potential for replication in other provinces or cities.

   b. Strengthen district and sub-district PPM networks, making use of all available domestic and international resources to launch urban TB initiatives with strong public-private-community partnership and local ownership in several cities, engaging large numbers of private providers of all sorts and public hospitals, developing and testing models and systems that can be sustained by regular district and sub district teams beyond the initial stages.

   c. Set up a multi-stakeholder mechanism comprising key stakeholders including JKN, IMA, private hospitals’ association, associations of private pharmacies and laboratories, regulatory bodies and potential intermediary agencies and community systems engaged in TB control in order to design, implement and monitor with clear targets and milestones, a phased scale up of effective, (sub) district-based, private provider engagement for delivery of quality TB care. This is essential to make rapid progress in a relatively uncharted work area.
d. Set ambitious national targets in the NSP 2016-2020 for the number of cases notified by private primary care providers, for instance at least 60/100,00030.

e. Improve understanding of how private primary TB care providers operate through a range of focused studies in collaboration with partners. In addition to mapping private providers and estimating the distribution of patients amongst them, studies should include “standardized patients”31 to understand actual practices (which typically differ from reported behaviors) and qualitative market research to better understand patient perspectives and preferences.

Note also that improvements in HMIS recommended in the chapter on Surveillance, Monitoring and Evaluation will play a very important part in facilitating better engagement of private providers.

7. Political commitment

The concepts of, and definition of, political commitment and its use as an indicator in tuberculosis control have change dramatically since the landmark 1998 Report of the Ad Hoc Committee on the Tuberculosis Epidemic first recognized it as a major constraint to the care and control of tuberculosis. In this report, effective political commitment was defined by three components: first, TB must be popularly perceived as a priority problem with a real solution in order that there be social demand for attention at the political level; second there should be consensus among the technical, medical and scientific community; and finally the mass media should be used to create a climate of public awareness and concern to sustain interest by political and governmental leaders.

a. Findings

In the Indonesian End TB Strategy 2016-2020, political commitment is found in Pillar 2 as “Bold policies and supportive practices”. The End TB Strategy seeks to now create (and measure) political commitment as an expression of appropriate public policies, and regulatory and legislative frameworks. A complex number of policies and regulations that reflect Indonesia’s circumstances and TB epidemic are in place. However, a decentralized approach, with lack of guidance and communication from the national to the provincial and district level, limits optimal implementation (Figure 14).

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30 This would represent 27% of the target total case notification rate of 225 per 100k
Achievements

- Indonesia has launched its revised National TB Control Strategy 2016-2020, including its Roadmap of TB Elimination 2015-2035, crucial to providing focus for maintaining political commitment for TB elimination at all levels;
- TB is one of the care targets of the Midterm National Development Plan 2015-2019;
- TB is one of the minimum services standards and included in a government decree;
- TB services are integrated into JKN;
- Regulations for the mandatory notification of TB have been completed;
- At the National Level, Parliamentary Committee 9 (Health, Labour, and Family Planning) will be developing additional policy (legislative) initiatives on TB and TB treatment in coordination with the parliamentary TB Working Committee. The parliamentary committees will also consult with the membership of the TB caucus, members of the parliament who may not be on the committees with jurisdiction on health issues, but who have a concern about TB.

b. Challenges

The revised National TB Control Strategy and the complex framework of policies and regulations present many challenges:

- The absence of strategic development and planning for advocacy activity at all levels creates an environment of missed opportunities for policy improvements, increased funding, or other needs;
- Guidance on the policy and regulatory framework is unclear from the central level and the provincial and central health authorities are unable to influence local implementation;
- Central TB policies and regulations are not implemented in many facilities due to the lack of training, supervision, and funding.
c. **Recommendations**

1. **The NTP should provide guidance to the provincial and district levels for the development and implementation of strategic planning for 2016-2020, identifying gaps, goals, objectives, and policies to strengthen and support the health system, regulatory framework, private sector engagement and advocacy with BPJS:**

   a. The information/analysis from strategic planning should be used to develop advocacy plans to engage provincial and district policy makers with all stakeholders including CSOs, FBOs, all care providers, NGOs, etc;

   b. Provide appropriate training and advocacy tools to ensure provincial and district levels are able to implement plans;

   c. The NTP should develop detailed monitoring and evaluation indicators from the strategic plan to assess progress in meeting goals and determine additional training needs.

2. **The MoH and partners should explore a Presidential Initiative to accelerate a multi-sectoral response:**

   a. To improve public awareness and accelerate development;

   b. To prevent 275 deaths per day;

   c. To support the NSP, that if targets met, will achieve a 10% fall annually in TB burden;

   d. Can be achieved with tangible results within 2 years;

   e. Can support participation in UN High Level Meeting, 2018.

8. **Early diagnosis and universal DST**

a. **Findings**

   Early diagnosis of TB cannot be measured directly, only inferred indirectly by determining delays between the onset of symptoms (very subjective and difficult-to-measure) and the initial visit to a care provider (patient delay), and the time between the initial visit and the date on which a diagnosis is established (diagnosis delay). Both patient and diagnosis delay lead to delays in treatment initiation, a critical issue for TB control (Figure 15)\(^\text{32}\). Delays in diagnosis and consequent delays in treatment initiation lead to on-going transmission of Mycobacterium tuberculosis (MTB), thereby perpetuating the epidemic, and more severe disease in the affected person, potentially leading to long term complications, such as chronic lung disease, and an increased risk of death.

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\(^\text{32}\) Osberg M. Indonesia Patient Pathway Analysis. Presentation to JEMM, Jakarta Jan, 2017
Delays in diagnosis relate to a number of factors, ranging from patient awareness of symptoms and access to care to laboratory performance and communication of results. In the Indonesia prevalence survey conducted in 2013-2014, only 18 of 426 (4.2%) prevalent cases were being treated at the time of the survey. Disturbingly 42.5% of the prevalent cases did not have a cough for more than 2 weeks or haemoptysis, the definition of suspected TB and the criteria for evaluation. There has been no analysis of data on other symptoms among the cases without cough. Other studies have shown a low sensitivity for cough of more than 2 weeks as the criterion for evaluation and a higher sensitivity if a broader definition of suspected TB is used, albeit with a reduction in specificity. Additional symptoms may include cough of any duration, unexplained fever, weight loss and night sweats. WHO has published guidelines on screening based on a number of systematic reviews of various approaches to screening for TB and the sensitivity and specificity of these approaches and tools (Table 6).

**Table 6.**
Yield of Symptom Screening for Tuberculosis

<table>
<thead>
<tr>
<th>Screening Tool</th>
<th>Sensitivity % (95% Confidence Interval)</th>
<th>Specificity % (95% Confidence Interval)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptom screening</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prolonged cough (lasting &gt;2–3 weeks)</td>
<td>35 (24–46)</td>
<td>95 (93–97)</td>
</tr>
<tr>
<td>Any cough</td>
<td>57 (40–74)</td>
<td>80 (69–90)</td>
</tr>
<tr>
<td>Any TB symptom (settings with low prevalence of HIV)</td>
<td>70 (58–82)</td>
<td>61 (35–87)</td>
</tr>
<tr>
<td>Any TB symptom (settings with high prevalence of HIV)</td>
<td>84 (76–93)</td>
<td>74 (53–95)</td>
</tr>
<tr>
<td>Any TB symptom (settings with low prevalence or high prevalence of HIV)</td>
<td>77 (68–86)</td>
<td>68 (50–85)</td>
</tr>
</tbody>
</table>

Any TB symptom = unexplained fever, weight loss or night sweats

In the prevalence survey, of patients who reported cough, 43% did not seek care, thus, contributing to patient delay: 59% of those who sought care did so in pharmacies, and only 41% visited a physician or nurse: approximately 30% of these saw providers in the private sector. Obviously, this pattern of care seeking would lead to delays in diagnosis. As indicated

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above, it is well-documented that sputum smear microscopy is an insensitive test, and the prevalence survey showed this to be true in Indonesia: of 411 cases with a positive culture or Xpert, only 40% were smear positive. Also of concern is that 43% of smear positive specimens were negative by either Xpert or culture, suggesting a substantial amount of over-diagnosis by sputum smear microscopy and raising questions about high proportions of false positive, as well as false negative, results, although some of the “false positive” results may have been caused by nontuberculous mycobacteria.

In the analysis of patient pathways to care in Indonesia, among patients who ultimately had a diagnosis of TB established, only 24% initially visited a facility with diagnostic capacity. Moreover, 74% initially sought care in the private sector, largely with providers or in facilities without access to diagnostic testing (Figure 16).

**Figure 16. Patient Pathways to Diagnosis**
Source: Ref 32

1. Initial Care Seeking Location (TB Symptoms)
   - 74% (Private)
   - 26% (Public)

2. Availability (“Coverage”) of Smear Microscopy at Health Facility Level/Sector
   - Assumed that “other” did not have smear availability
   - 73% (Public - L2)
   - 59% (Private - L2)
   - 2% (Private - L2)
   - 19% (L1)

3. % of Patients Who Access Facilities with Smear Availability on Initial Care Seeking
   - 100% (Public - L1)
   - 24%

b. Challenges

During the JEMM, field teams encountered a number of issues that influence diagnosis delay. Data from Jakarta showing low number of suspect evaluations to find one case (approximately three evaluations to find one case) suggest that there is under-recognition of TB symptoms or failure to seek a diagnosis when symptoms are present. This finding may indicate that only those with the most severe symptoms are evaluated, whereas, less severely ill patients who, in fact, have TB are not evaluated.

Identification and screening of persons or populations with an increased likelihood of having TB is performed only on a very limited scale. Of particular note is the failure to undertake identification and investigation of persons exposed to patients who have newly diagnosed TB (contact investigation).

Diabetes is said to be common among patients with TB. A study from a clinic in Jakarta and a hospital in Bandung showed an odds ratio of 4.7 for TB in diabetic patients, but there has been no large scale quantification of its magnitude or any systematic effort to screen diabetic patients for TB or, conversely, TB patients for diabetes. However, in the prevalence
study the proportion of participants with TB was twice as high among those with diabetes compared with those without. Although, apparently, there is a high level of screening among persons living with HIV (PLHIV), HIV testing guidelines in general clinics are not widely followed. Consequently, many in this risk group go unidentified and are not screened for TB. Among risk groups, such as PLHIV, chest radiography is a highly sensitive tool\[34\] (Table 7) for identification of persons who should have further diagnostic testing, yet radiographic facilities are very limited and generally available only in hospitals.

**Table 7. Yield of Chest Radiographic Screening for Tuberculosis**

<table>
<thead>
<tr>
<th>CHEST RADIOGRAPHY</th>
<th>SENSITIVITY</th>
<th>SPECIFICITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any abnormality compared with TB (active or inactive)</td>
<td>98 (95 -100)</td>
<td>75 (72 – 79)</td>
</tr>
<tr>
<td>Abnormalities suggestive of active TB</td>
<td>87 (79 – 95)</td>
<td>89 (87 – 92)</td>
</tr>
<tr>
<td>After positive screening for symptoms</td>
<td>90 (81 – 96)</td>
<td>56 (54 - 58)</td>
</tr>
</tbody>
</table>

Related to delays in diagnosis of drug resistant TB, the field teams found a very low proportion of retreatment cases among all notified cases which is reflected in the national data as well. This suggests a general failure to take an accurate medical history focusing on risks for drug resistance and, thus, a failure to test for resistance with Xpert leading to delays in diagnosing drug resistant TB. In the 2013-14 prevalence survey 3.2% of all participants (not only those with current TB) reported having had TB in the past. Among patients detected in the survey 14.1% gave a history of previous episodes of TB. However, among all pulmonary cases reported in 2015, only 3.5% were categorized as retreatment cases; thus, according to these data, there was no significant difference between the prevalence of prior TB among patients with TB and the general population. Also, with regard to evaluation of patients with risks for having drug resistance, the general practice seems to be that the patient is instructed to go to the PMDT referral hospital laboratory to collect the sputum specimen. But the laboratory is many hours away, so patients do not. This issue may also apply to persons living in remote areas, distant from a diagnostic facility. Apparently, there are no sputum transport systems in place to overcome these potential barriers to diagnosis.

The JEMM field teams also encountered problems with the performance of the public microscopy centers. These are discussed in the section on diagnostic testing. There was no assessment of private laboratory performance. These deficiencies in the public sector, and, likely, in the private sector as well, would reduce the performance of microscopy-still the most commonly used diagnostic test - leading to further delays in diagnosis. Xpert units have a limited distribution, but still they are underutilized.

There are many points in the system in which communication failures occur and potentially lead to delays in diagnosis and treatment initiation. Laboratory results are commonly not communicated back to the ordering clinicians or facilities in a timely manner, if at all. Communications between referral centers and referring clinicians are often very limited and incomplete. These communication failures may well result in a failure to initiate treatment in patients with positive smears and, in effect impose a diagnostic delay.
Given the geography of Indonesia, it is highly likely that geography poses a barrier to health care access and, thus, diagnostic delays; however, this issue was not formally assessed in the field visits. Stigma and costs of care may also impose diagnostic delay. Both of these factors clearly influence treatment adherence but this was not systematically assessed in the JEMM.

It should be noted that the JEMM field teams received very little information on case finding and diagnosis from the private sector, thus, our impressions are limited. Cases in the private sector that probably number as many as in the public sector, largely go unreported and the outcomes are unknown. Diagnostic evaluations are limited, in part by lack of access to laboratories, although chest radiography is widely used. Yet, given the understaffing of public sector facilities, it is evident that the private sector must be considered as a critical part of the health care work force - outreach to this sector is covered in Section 6 and, through the JKN, in Section 4.

c. Recommendations

Several of the areas these recommendations address are currently covered under national policies, but these policies are not optimally implemented. In order to understand the barriers to implementation and develop solutions, implementation research should be assigned a high priority in the national research agenda.

1. **Under-identification of persons suspected of having TB:** The criteria for undertaking an evaluation of individuals for TB should be expanded. Data from the prevalence survey should be analyzed to determine the performance of various symptoms, singly and in combination, to identify persons with suspected TB in the Indonesian context. Pilot studies should be undertaken to determine implementation steps for, and results of, using an expanded set of criteria. It should be recognized that expanding the criteria for evaluation (usually, sputum smear microscopy) will increase the workload for an underperforming laboratory network that uses an insensitive diagnostic tool. Thus, where possible, Xpert should be widely deployed and used as the diagnostic test of choice. Areas where Xpert will not be available, at least not in the near future, should be equipped with modern LED or fluorescent microscopes and routine EQA implemented.

2. **Evaluation of persons exposed to patients with newly-diagnosed infectious TB (Contact investigation):** National program guidelines should indicate that contact investigation, particularly when those exposed are either children less than 5 years of age or persons with immunosuppressive conditions, is a high priority program activity. Global guidelines developed by WHO should be followed. Data on performance of contact investigation should be collected and performance evaluated. Implementation research should be undertaken to identify barriers to implementation and suggest possible solutions.

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35 This will require:
   a. a good logistics system in place to address the short expiry times of reagents;
   b. re-staining the slides before rereading because high temperature and humidity results in fading of AFB positive slides within 4-8 weeks, and for blinded smear rechecking.
   c. sterile water to wash the slides at the primary microscopy site to avoid environmental mycobacteria contaminating the slides. In one example in Bali (Pusk Kintamani IV) restaining found 100% AFB positives. Research has found that 40+% of scanty positives are culture negative, so there is uncertainty whether we are looking at dead TB bacilli or NTM that don’t grow in conventional mycobacteriological media. (Barnard et al LPA paper)
3. **Identification/screening of risk groups:** Given the documented risk of TB among diabetic patients in Indonesia, systematic screening of patients with diabetes should be pilot tested in diabetic clinics and if successful, scaled up more broadly. Similarly, patients with TB should be screened for diabetes.

4. **Increasing case finding through use of more sensitive screening tests:** Strategic placement of chest radiography facilities for TB screening of high risk persons such as PLHIV should be evaluated. Computer-assisted diagnosis should be evaluated as part of the assessment. Similarly the use of Xpert for screening PLHIV should be utilized and performance assessed.

5. **Increasing identification of persons at risk for drug resistance:** The importance of obtaining an accurate history concerning previous treatment for TB should be emphasized in training programs. The TB treatment card should be modified to make a history of retreatment a more prominent feature. Xpert units should be more widely deployed and utilized for evaluation of persons at risk of drug resistance per WHO guidelines.

6. **Reducing communication failures:** Electronic systems linking source of care with laboratory (and vice versa) and between sources of referral and next level facilities (and vice-versa) should be developed and implemented.

7. **Improving private provider access to TB diagnostic services:** (In line with recommendation 1, Section 6) Public and private laboratories should be contracted to make microscopy, chest x-ray, and Xpert available to all JKN care providers and free of charges to patients (either via JKN non-capitation payment or payment direct from NTP).

8. **Strengthening district-based private-public linkages:** (In line with recommendation 1, Section 6) GFATM resources should be utilized to launch intensive urban TB initiatives engaging private providers of all sorts (physicians, pharmacies, laboratories, hospitals), in the context of powerful JKN incentives, mandatory case notification, minimum package standards and district action plans. Lessons learned from the Hospital-DOTS Linkage (HDL) program should be used to inform the model in what might be called HDL-plus.

9. **Diagnosis and laboratory management and infection control**

   **a. Findings and challenges**

   The main focus of the JEMM review was on provincial and health centre diagnostic/laboratory services, rather than on culture and DST. A National TB Laboratory Plan, 2016-2021 was released in January 2017. It provides the blueprint for planned activities for the TB laboratory network over next five years.

   Prior to 2011, the TB laboratory network in Indonesia did not have a National TB Reference Laboratory (NTRL) which impacted adversely on laboratory network development, quality assurance, and on the rapid implementation of new diagnostic technologies. A ministerial decree signed in 2011 established three NTRLs, each with a single specialised area of excellence - microscopy, culture, and molecular tests – and not all are within the MoH. This NTRL model needs to be revised, strengthened, and properly funded using laboratories within the MoH. Given the size and complexity of Indonesia (>15,000 islands), multiple NTRLs are required and located in key strategic sites.
New diagnostic technologies are changing the TB landscape in Indonesia. Indonesia adopted a new diagnostic algorithm recommended by WHO for the End TB strategy. Within this algorithm, Xpert MTB/RIF is now the recommended initial test for the diagnosis of all presumptive TB cases. Rapid national expansion of Xpert testing capacity with effective support mechanisms is vital to implement the new algorithm. The NTP is rapidly increasing the number of Xpert machines, and plans to reach 750 by the end of 2017, and 2,000 machines by 2020 (Table 8). To achieve this major undertaking, a strong coordination team with a good Xpert expansion plan is essential. However, the NTRL, Molecular is unable to take this coordination role, and therefore the country is mainly depending on external stakeholders for coordination.

Table 8.
Laboratory Expansion Plan for Xpert Machines
Source: National TB Laboratory Plan, 2016-2021

<table>
<thead>
<tr>
<th>Target of TB case finding</th>
<th>Baseline</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target of presumptive TB (10%)</td>
<td></td>
<td>332,000</td>
<td>396,976</td>
<td>530,493</td>
<td>599,338</td>
<td>605,291</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3,320,000</td>
<td>3,969,760</td>
<td>5,340,930</td>
<td>5,993,380</td>
<td>6,052,910</td>
</tr>
</tbody>
</table>

Planning of Diagnostic Test

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Microscopy</td>
<td>99.8%</td>
<td>68%</td>
<td>60%</td>
<td>55%</td>
<td>45%</td>
</tr>
<tr>
<td>b. Xpert</td>
<td>0.2%</td>
<td>32%</td>
<td>40%</td>
<td>45%</td>
<td>55%</td>
</tr>
</tbody>
</table>

Burden of Examination for TB Diagnosis

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Microscopy</td>
<td>2,257,600</td>
<td>2,381,856</td>
<td>2,917,712</td>
<td>2,697,021</td>
<td>1,815,873</td>
</tr>
<tr>
<td>b. TCM (positivity 10%)</td>
<td>1,062,400</td>
<td>1,587,904</td>
<td>2,387,219</td>
<td>3,296,359</td>
<td>4,237,037</td>
</tr>
</tbody>
</table>

Testing Capacity, with assumption 3 times running per day, 20 days per month

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum capacity</td>
<td>2304</td>
<td>2304</td>
<td>2304</td>
<td>2304</td>
<td>2304</td>
</tr>
<tr>
<td>Xpert need based on proportion of Xpert compare to Microscopy</td>
<td>461</td>
<td>689</td>
<td>1,036</td>
<td>1,431</td>
<td>1,839</td>
</tr>
<tr>
<td>10% increase based on administrative and geographical assumption.</td>
<td>507 (2,000)</td>
<td>758 (3,000)</td>
<td>1,140 (4,400)</td>
<td>1,574 (6,000)</td>
<td>2,023 (8,000)</td>
</tr>
</tbody>
</table>

Currently, Xpert utilization is low - in practice only patients at risk of MDR TB are referred for Xpert (95% of total tested, data 2016). For PLHIV, about 1,900 tests per year are done, yet UNAIDS estimated that there were 600,000-790,000 PLHIV in Indonesia in 2015. Although the new national strategic plan, with the new diagnostic algorithm, was implemented in April 2016, none of the visited facilities were aware of this major change.

The expected increase in MDR diagnosis as a result of GeneXpert expansion, and the forthcoming implementation of the short-course regimen, require both availability of rapid second line drug testing using the molecular line probe assay (LPA) and enough high quality culture and phenotypic DST capacity. Under EXPAND-TB, Indonesia implemented LPA testing for first line anti-TB drugs, but once that project concluded, testing stopped. Three sites have been assessed recently and the test kit for second-line DST has been registered and other sites identified as having potential to implement the technology. However, lack of a nation-wide specimen transport system limits the potential utility of the second-line LPA testing.

36 When the LPA result suggests resistance to 2nd line injectables and fluoroquinolones (FQ), it is recommended that phenotypic DST should be performed, especially when there is a low (< about 15%) prevalence of resistance. In Indonesia, the prevalence of SLID resistance is <10%, while FQ resistance may be high (>30%).
A well-designed rapid, safe and sustainable specimen shipment system to laboratories is essential. A pilot study in 5 provinces was successful and external funding has enabled the study to continue. However, communication to the health care settings is lacking, and front-line staff are not aware of the continuation. In any case it is not available in the other 28 provinces. Transport of laboratory results back to facilities is also a problem. In most cases, patients have to travel to a higher level facility, leading to a higher drop out and risk of transmission of (DR) TB. Using only external funding brings sustainability into question.

An effective quality assurance (QA) system leads to reliable and high quality results. However, data from the external quality assurance (EQA) of smear microscopy shows major challenges. In 2016, only 4% of microscopy centers participated in the cross checking (see Table 9). For the other centers the quality of the performance is unknown. The smear results seen during the review indicate that slide reading performance is weak. Scanty bacilli were rarely reported and EQA showed unacceptably high numbers of laboratories with major errors. Furthermore, daily, or even weekly, internal quality control is used rarely. One team discovered multiple laboratories in one province were reporting microscopy results despite no specimens being received. The practice related to incentives for smear microscopy workload (SE Sulawesi team). Another team found that smear microscopy was performed unnecessarily in parallel with Xpert to create income (Jakarta team).

**Table 9. Quality Control Results of TB Laboratories, 2013–2016**

Source: National TB Laboratory Plan, 2016-2021, with personal communication of the latest results from the NTP laboratory coordinator

<table>
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<tbody>
<tr>
<td></td>
<td>(Number of microscopy center = 6226)</td>
<td>(Number of microscopy center = 6820)</td>
<td>(Number of microscopy center = 6820)</td>
<td>(Number of microscopy center = 6226)</td>
</tr>
<tr>
<td>Q1 Q2 Q3 Q4</td>
<td>Q1 Q2 Q3 Q4</td>
<td>Q1 Q2 Q3 Q4</td>
<td>Q1 Q2 Q3 Q4</td>
<td></td>
</tr>
<tr>
<td>∑ Microscopy center participated in EQA</td>
<td>2.154 2.805 2.627 1.793</td>
<td>1.597 2.175 1.896 1.756</td>
<td>1.793 1.642 811 1.114</td>
<td>425 252</td>
</tr>
<tr>
<td>% Covered of crosscheck (CC)</td>
<td>35% 45% 42% 29%</td>
<td>23% 32% 28% 26%</td>
<td>26% 24% 12% 16%</td>
<td>7 4</td>
</tr>
<tr>
<td>Good performance labs among labs participated in CC</td>
<td>63% 67% 62% 65%</td>
<td>73% 72% 73% 65%</td>
<td>69% 71% 66% 81%</td>
<td>51 81</td>
</tr>
<tr>
<td>Good performance labs among all labs</td>
<td>22% 30% 26% 19%</td>
<td>17% 23% 20% 17%</td>
<td>18% 17% 8% 13%</td>
<td>4 3</td>
</tr>
</tbody>
</table>

The main reasons for the low participation in EQA are, 1) a complex EQA network structure, with the burden pushed onto the provincial level, where staff are overloaded; 2) the wasor has a key role in the EQA process, but has many other responsibilities taking up his/her time; 3) the budget at each health facility is insufficient and often not spent for this activity; and 4) the digital EQA reporting system is not used systematically owing to lack of training of the end users. It needs to be updated to match current needs. Moreover, internet capacity across the nation, and especially so in more remote provinces, is problematic leading to frustration, and staff not using electronic reporting systems.
The NSP 2011-2016 states “to increase access to laboratory testing all satellite primary health centres will be independent primary health centres by the end of 2020 with the equal ability of conducting microscopy examination”. However, recently released WHO guidelines\(^3\) indicate that to increase “patients’ access to rapid and accurate diagnostics, all countries should aim to phase out microscopy as the primary diagnostic test before 2025. Accordingly, countries should not invest further in establishing additional microscopy facilities”. This means that further decentralisation of microscopy should be carefully reviewed by the NTP.

b. Recommendations

1. **The MoH should urgently revise the existing National and Regional laboratory network to bring it in line within the MoH structure, with clear roles and responsibilities and service package at national and regional levels.** In particular, the NTP in collaboration with the MoH and partners, should:
   a. Review the present policies, guidelines, and roles and responsibilities, for each level in the lab network and identify gaps;
   b. Perform a landscape analysis of the structure and budget linkages at all levels;
   c. Revise the policies, guidelines and roles and responsibilities when gaps are identified;
   d. Map the links among the MoH, National Institute of Research and Development (NIHRD), NTP, NTRL, and Regional TB Reference Laboratory, and assign roles and responsibilities according to the policy;
   e. Determine which laboratories should be assigned as the National and Regional Reference Laboratories and define the transition plan to the new structure;
   f. Conduct an on-site assessment of present conditions (e.g. infrastructure, equipment, technical skills, funding, HR) in the context of their planned roles, defining gaps and determining necessary steps forward;
   g. Ensure human resources and funding are sufficient for the above activities to be undertaken;
   h. Re-assign catchment areas to the NTRLs and develop a National and Regional sample transportation system from the peripheral health centers-to-districts-to-provinces-to national level for high-level diagnostic testing as required;
   i. Create a National TB laboratory Advisory Group to advise on activities and to continuously review National TB Lab Guidelines as global recommendations are revised.

2. **The MoH should work with provinces to develop a provincial-specific TB laboratory network in line with the revised National TB Lab Network Guideline.** The NTP and the NTRLs, in collaboration with the PHO, should:
   a. assign roles and responsibilities to the lab services in provinces and districts according to revised National TB guidelines;

\(^3\) WHO. Framework of Indicators and Targets for Laboratory Strengthening under the End TB Strategy. 2016, Geneva.
b. map the links among the various facilities that can diagnose TB, and assign their roles according to the policy;

c. empower the PHO and DHOs to implement and enforce the policy including supervision, QA and infection control activities and assign a sufficient budget;

d. improve, among clinician and other health care staff, the understanding of the principles of the laboratory network and awareness of the national recommended laboratory services by providing a pocket guide (or mobile App) that contains the relevant information;

e. establish a nation-wide fast, safe, and sustainable sample transport system;

f. provide a well-designed recording and reporting mechanism for fast reporting of the results back to the clinician and reporting to the higher level of the lab network.

3. The MoH/NTP should review the current plan to expand smear microscopy services to all *puskesmas*, in light of the recent WHO guidelines, and reconsider further investment in additional microscopy facilities.

4. For the expansion of the TB laboratory network, the NTP should urgently prepare an action plan to strengthen critical components, including:

   a. Establishing a strong coordination team to oversee the progress and to detect and solve challenges and bottlenecks early during the scale up activities;

   b. Priorities Xpert rollout to the highest TB burden health care facilities;

   c. Ensure dissemination of, and adherence to, the new Xpert algorithm at all TB diagnostic laboratories; pulmonologists and other clinicians responsible for identifying presumptive TB cases; and all directorates of PHO and DHO responsible for cartridge procurement/instrument placement;

   d. Establish an Xpert team at provincial and district level to increase capacity for on-site preparation, training, supervision, troubleshooting and M&E;

   e. Equip all Xpert instruments with GXAlert to enable the automatic, electronic reporting and collation of all results (see Section 12), and explore links with all diagnostics that have electronic output (e.g. MGIT, LPA) to enable immediate reporting back of results to the clinician; assist stock management; monitor service issues (e.g. module failures);

   f. Ensure that PMDT capacity to treat MDR-TB patients to cure is matched with diagnostic capacity.

5. The NTP should improve quality assurance within the national and provincial lab network including a strong EQA system for each diagnostic service:

   a. Establish a laboratory supervisor system at provincial and district level to ensure that EQA services are delivered in a timely manner to improve the participation and performance of the laboratories providing a smear microscopy service;

   b. Link these new positions with the scale up of Xpert testing to provide relevant EQA support to the Xpert network;

   c. Ensure the availability of a network development budget (intra-sectoral collaboration needed) to support the laboratory supervisor system and the provision of EQA for laboratory services;
d. Support the NTRL to strengthen and supervise directly the provision of EQA to laboratories undertaking TB culture, drug susceptibility testing, and LPA;

e. Use GLI standards to identify the necessary quality performance indicators for each level and introduce fast reporting mechanisms, with direct corrective action taken. Introduce a Laboratory Quality Management System (LQMS) to the NTRLs.

6. Create an environment for the private sector to have access to Xpert testing, to be involved in the laboratory EQA programs and to notify results to NTP

a. Conduct a mapping assessment of the private sector laboratories to obtain detailed information of their current engagement with the public sector laboratories (including Xpert testing) and their participation in public sector EQA activities;

b. Develop and implement a strategy for the public laboratory network to provide diagnostic services to the private sector; patient data is sent to the NTP and the patient returns to private sector for management;

c. Support the private sector laboratories to improve their performance through participation in public sector training, implementation recording and reporting to the public sector;

d. Explore PPM models for laboratories used in other countries to see if they fit Indonesia (e.g. ARC project in Bali 2004-2009; IPAQT India model- engaging QA private labs, IRD Pakistan model – engaging private hospitals).

10. Treatment

a. Findings

The NSP 2015-2019 contains clear and SMART treatment objectives, with well-articulated strategies to reach and maintain a treatment success rate (TSR) of over 90% by 2019 for new patients put on first line treatment (FLD), and a TSR of over 75% for MDR-TB patients put on a second line regimen (SLD). The objectives are set for all forms of TB, bacteriologically confirmed as well as clinically diagnosed, and for providers working for both the public sector as part of the NTP, and for the private sector. The strategy follows a holistic and inclusive approach by engaging hospitals and private providers e.g. through implementing certification schemes developed by the IDI. It also seeks collaboration with other professional associations such as the Indonesian Pulmonologist Association (PDPI), the Nurses (PPNI) and Pharmacist Associations (IAI).

Since 2000, the overall TSR has been very good at over 87% on average. Since 2012 over 1.3 million patients have been treated, resulting in around 1 million lives saved. However, those infected with HIV have lower success rates (~50%) as well as patients treated in the private sector, particular in those settings where there is limited provision for treatment follow-up. There is variation, too, among the provinces; some with very high cure rates and low treatment completion rates while others reported the reverse; a few with significant levels of patients not-evaluated; and some with large TSR variation between years (Figure 17). There has been an increase in reports received from hospitals, including private hospitals, while reporting from private physicians remains minimal.
During the field visits, we observed several districts reporting 100% cure rates, which suggests some issues around data accuracy. We also observed that only those patients receiving NTP drug packages with FDCs were reported and notified to the SITT, while patients receiving loose drugs were not.

Treatment organization at health facilities with “TB corners” varies, with good and less good examples.

The NSP also aims to reduce the TB mortality rate by 40%, by 2020, as compared to 2014. While around 7,500 of the notified cases die, WHO estimates that around 100,000 die from tuberculosis each year. Although the JEMM didn’t observe high case fatality rates among those treated, those not notified are likely to have higher mortality.

The JEMM found that most patients detected are treated according to the current national TB guidelines, either with Category I (new cases) or Category II anti TB drugs (for re-treatment cases) with intermittent treatment in the continuation phase. DOT is provided according to the national guidelines, with 2 weeks supply using treatment observers that are mostly family members or a sub-health center’s staff, midwife, or other cadre. We also found that the cadres recruited by Aisyiya help patients in their adherence, and even offer socio-economic support for MDR patients on treatment.

According to the national basic health research (Riskesdas) in 2013 and the International Diabetes Foundation (IDF) data in 2015, the population of diabetics in Indonesia is estimated to be 9.1 million. By 2030, however, it is expected to have risen to 21.3 million. The Sample Registration Survey (SRS) 2014 placed diabetes as the country’s third cause of death (6.7%). Only 30% of all diabetics in Indonesia are diagnosed, and of those, only two thirds are put on treatment. Diabetes increases the risk of developing TB disease by 3 times, and treatment of TB patients with diabetic comorbidity are more likely to have late sputum conversion or fail. Death during TB treatment and post-TB treatment relapse are both more likely with diabetes. More than 10% of TB patients are diabetic.
In response to this, the MoH of Indonesia initiated and published in 2015 a “National Consensus for TB-DM Management”, as a reference for clinicians in providing quality care of TB and DM at all levels of health facilities. It includes guidance on i) TB screening for diabetic patient and diabetes screening for TB patients done immediately after either diagnosis is confirmed; ii) diagnosis; iii) treatment; iv) referral; and v) prevention.

b. Challenges

We observed that out-dated treatment procedures are still practised (intermittent intake, loose drugs and Category II). However, the new NTP guidelines for 2017 (published during this JEMM) are correctly adjusted towards the use of fixed dose combinations (FDC), daily intake in the continuation phase, and abolition of the Category II regimens, to be replaced with a SLD regimen for those patients detected with rifampicin resistance by GeneXpert. However, we noticed that the news of new policies does not automatically reach the peripheral level.

There were several explanations why treatment with loose drugs are still used as standard regimens:

- In principle, patients included in the JKN system are supposed to be treated at Puskesmas level, and patients diagnosed in hospitals should be referred accordingly. Hospitals are supposed to treat only complicated patients and the JKN doesn’t allow reimbursement for treatment of straightforward TB in hospitals. Only seriously sick patients can be hospitalized, and sometimes receive treatment with non-standard dosages or for prolonged durations. However, patients who are not (yet) in the JKN system are allowed to start treatment in the hospitals. And as hospitals don’t receive FDCs, these patients are provided loose drugs. This transition phase for hospitals is sometimes confusing;

- Puskesmas only provide FDCs for smear positive patients and loose drugs for other types such as smear negative and EP patients.

There is no comprehensive treatment approach regarding co-morbidity (HIV, DM etc.). Examinations for these potential co-morbid illnesses are not standard when the TB diagnosis is established, but rather only performed on a clinical suspicion. For these investigations, patients still need referral and the patient may be reluctant to be referred. When a co-morbidity is diagnosed, the treatment cannot always be provided at the same facility.

Treatment organization in TB corners is not always up to patient friendly standards: patient cards are sometimes not well filled; there is no unit register, or there is an old version in use without space for information on HIV or DM status. “Follow-up” of smear negative TB, EPTB and childhood TB is sometimes inadequate. The use of treatment support material for patients differs; some of the field teams did, but some did not, observe any patient treatment support aids, such as IEC material on the length of treatment, the importance of treatment adherence or treatment procedures.

There are indications suggesting that smoking increases the risk of poor treatment outcomes by 2 to 3 times, yet, in spite of the fact that Indonesia has the highest rate of male smoking in the world (78%), the JEMM found no evidence of anti-smoking advice being given to patients with TB. Awareness that smoking increases risk for TB should be part of public health campaigns.
c. Recommendations

In order to reach the targets of a treatment success rate of >90% for all types of TB, and significantly reduce mortality, we recommend the NTP take the following actions to improve the quality of care:

1. **Ensure country-wide dissemination of the new treatment guidelines to all staff responsible for TB control or management at all levels, that include:**
   a. Daily fixed-dose tablets should immediately replace the three-times-a-week fixed dose combinations in the continuation phase;
   b. Descriptions of how the new universal insurance program interacts with the national TB program;
   c. Strong advice to stop smoking.

2. **Better define and support the roles and responsibilities of the PHO CDC staff (Provincial Wasor), DHO CDC (District Wasor) at province and district levels (this level of staff plays an important role in the introduction of the new guidelines and improving treatment).** They should train all relevant staff in the health facilities and provide systematic quality supervision (both programmatic and clinical) to the facilities and improve the coordination and collaboration between program staff and clinician. Involve the professional organizations as needed for the clinical supervision and mentoring. These roles and responsibilities are provincial/district specific but we recommend that NTP Central Unit is also involved in order to achieve consistency nationwide.

3. **PHO CDC staff (Provincial Wasor), DHO CDC (District Wasor) should:**
   a. establish comprehensive treatment services in TB clinics according to the new guidelines including the routine screening, testing and treatment of co-morbidities such as HIV and diabetes (DM);
   b. improve collaboration with HIV and DM programmes. Ensure that all eligible patients receive ART and/or co-trimoxazole (see also Section 11);
   c. strengthen the patient centred approach, for example provide ‘one-stop service’ for TB-HIV patients and TB-DM patients, etc;
   d. For DM in particular, set up a means of coordinating diabetes and TB activities and ensure the dissemination and implementation of the 2015 “National Consensus for TB-DM Management” guidelines.

4. **Peripheral NTP staff should ensure good treatment follow-up on all types of patients:**
   a. PHO CDC staff (Provincial Wasor), DHO CDC (District Wasor) should through their supervisory visits support systematic treatment organization procedures at the treatment centres, including; the proper use of up-to-date cards, forms and registers; facility means for tracing when patients are lost to follow up;
   b. They should support the linking between health facilities and CSOs, cadres etc. working in the community to help patients to adhere to treatment;
c. Provide special attention and systematic procedures for those patients whose treatment is under clinicians in the private sector, where even less means for follow patients are available. The NTP Central Unit should develop and distribute generic educational material for patients, including pamphlets with information on length of treatment and actions to improve outcomes, such as regular drug intake, smoking cessation, etc.

11. TB/HIV

a. Findings

Indonesia is among top 30 highest TB/HIV burden countries in the world. The HIV epidemic is largely concentrated in key populations, although a low level epidemic exists in some provinces and a generalized epidemic in two others (Papua and West Papua). The overall coverage of HIV prevention services remains low, resulting in high levels of unsafe behavior and low awareness. Stigma to both HIV and TB among communities, patients and health providers exists. The antiretroviral therapy (ART) coverage remains critically low at 63,066 (19%) out of an estimated 328,406 people living with HIV (PLHIV) eligible in 2015. Consequently CD4 counts at presentation to ART sites remain low. In 2015 there were an estimated 78,000 cases of HIV-associated TB. However less than 5% of these were detected and notified to the National TB and HIV programmes.

Provider initiated HIV testing and counselling (PITC) is adopted as a national strategy for TB patient since 2013 (Minister Decree no.21/2013). However, HIV testing services remain concentrated at higher level health facilities. Usually, voluntary counselling and testing is practiced instead of PITC, requiring signed informed consent which is likely a barrier for the high uptake of HIV testing in TB patients. District TB officers received training on PITC, but did not practice it due to lack of clear instructions from the NTP and NAP. Staff at the TB treatment sites, which are highly decentralized, lack any training on counselling for HIV testing. In 2015, only 11% of the notified TB patients had known HIV status. Only one province (Bali) achieved more than 50% coverage, while coverage was less than 40% even in Papua and Papua Barat which have a generalised HIV epidemic, and 20 out of 34 provinces achieved less than 10% coverage. It was unclear whether this is due to low implementation, or a reporting gap, or both.

According to the NAP, 54% of HIV positive TB patients received co-trimoxazole preventive therapy (CPT) and 51% ART. However review of data reported by the NTP shows less than 25% HIV positive TB patients started ART and less than 35% CPT, which is a clear mismatch of data reported for the same cohort of patients. In addition to low coverage, this also points to a need for strengthening linkages between the SITT and SIHA and establishing mechanisms for regular data sharing and validation between the NAP and NTP. Provision of isoniazid preventive therapy (IPT) remains very low at less than 10% of eligible PLHIV identified in 2015.

b. Challenges

HIV appears to have been rising steadily in Indonesia for over 20 years with no effective interventions applied sufficiently to halt its rise. The TB JEMM and HIV external review, which took place simultaneously, made the following observations:
1. **TB/HIV collaboration at national, province and district level**

Only two meetings of the National TB/HIV working group/forum were called in 2016 and there is lack of systematic monitoring of such meetings at the provincial and district levels by the NTP and NAP. Only 4 provinces were visited from the national level to review collaborative TB/HIV activities and supervision of TB/HIV activities was virtually absent at the province and district levels. These resulted in the key operational issues remaining unresolved e.g. lack of free HIV tests, stock out of isoniazid / co-trimoxazole, incomplete recording and reporting (177 districts did not report in 2014) and gross mismatch between data reported separately to the NTP and NAP, particularly with regards to ART provision.

2. **HIV testing services**

There are a total of 3,204 HIV testing sites in 514 districts in Indonesia, but there is limited availability of testing services at the Puskesmas level where the majority of TB patients receive treatment. TB patients are not offered HIV test routinely as providers anticipate stigma and offer an HIV test only to those having high risk. TB training lacks operational guidance on implementation of PITC and staff providing TB services do not receive any training in HIV counselling. Therefore there is a general lack confidence in offering HIV testing among specialists, doctors and nurses. The quality of counselling too remains suboptimal indicated by the low acceptance rate and linkage to ART in TB patients. This calls for incorporating brief HIV counselling content in basic TB training. Clients/ patients need to provide signed consent (both to opt in or out of HIV test) further affecting uptake. HIV tests are not offered free of cost at all sites particularly if the patient does not belong to the Puskesmas area or lacks insurance cover. Some private clinics charge the patients for HIV testing because, rather than rapid tests, they perform ELISAs, which are not routinely reimbursed by JKN.

3. **Linkage to ART**

There are 462 ART sites and 213 satellites in Indonesia however ART coverage remains very low particularly among the HIV positive TB patients (25%). Very few Puskesmas can start ART despite proposed decentralization in the HIV NSP. Although some decentralization is seen, the progress remains slow due to lack of a strategic focus. Delay in starting ART is noted even in HIV positive TB patients and coverage of CPT remains low since procurement of CPT was delegated to the districts but with no mechanism to monitor availability at facility level by the NAP.

4. **Intensified TB case finding and TB prevention at HIV care sites**

Implementation of intensified TB screening among PLHIV is suboptimal. Cough for two weeks duration is used as a screening criterion instead of TB symptoms of any duration, which is likely to miss large proportion of presumptive TB case. This is also evident from the very low proportions of extra pulmonary TB and clinically diagnosed TB noted among PLHIV. Further, PLHIV do not receive Xpert MTB/RIF as first test for diagnosis of TB in spite of the fact that it is recommended by the national guidelines. Less than 10% of the eligible PLHIV identified through the TB screening started IPT in 2015. It was noted during field visits (e.g. prison in Semarang) that PLHIV who are on ART are not prescribed IPT, highlighting an important training gap. Isoniazid 300 mg tablets were not available at the HIV facilities visited by JEMM, although drugs were available in the provincial drug stores.
NAP staff however mentioned that clinicians’ reluctance and fear for emergence of drug resistance are common reasons for low uptake of IPT.

5. Other key observations

It was noted during field visits that BPJS covers only 1 consultation per month for chronic conditions including TB/HIV. This is a barrier and disincentive to provide TB services, if HIV services are used by the PLHIV during a particular month. There is limited or no access to TB/HIV services in the opioid substitution therapy sites (87), needle exchange programmes (215), or Prisons (127). Also there is lack of information on TB/HIV intervention in the mining areas and factories. Implementation of infection control practices is variable. Satisfactory infection control measures were noted in some of the MDR-TB sites visited, but were lacking in TB treatment and ART sites. Airborne infection control is particularly important in the HIV care and treatment sites considering extremely high TB burden. The national programme efforts for private sector engagement with NAP and NTP remain in siloes, calling for joint planning and implementation.

c. Recommendations

1. The JEMM recommends National TB and HIV programmes to revitalize the TB/HIV forum/technical working group at the national level, and collaborative mechanisms at the provincial and district levels to streamline implementation and scale up collaborative TB/HIV activities

   a. Revisit composition of the forum/TWG and raise its profile to enable regular review of programme implementation, identification of operational barriers and to take prompt policy decisions to address the same. Involve higher level officials from other departments like the medical services, The Ministry of Law and Human Rights, MoIA etc. and chairs of professional organizations like the pulmonologists, infectious disease specialists, internal medicine specialists etc. Include representatives from key national and international partners providing technical assistance and the community members on the forum/TWG;

   b. Undertake mid-term reviews of progress in implementation of the national TB/HIV action plan (2015-2019) and revise performance targets to ambitious levels as recommended below to achieve impact.

2. Both the HIV review team and JEMM TB strongly recommend adopting a differential approach to rapidly scale up the TB/HIV response in Indonesia. The following section provides the guiding principles for differential scale up, followed by specific actions, by thematic area. (More than 85% of the burden of HIV and HIV associated TB in Indonesia is contained in 141 high HIV burden districts identified through a prioritization exercise by the two national programmes (PLHIV ever/newly enrolled in care, HIV positive TB cases detected in 2015).

   a. The NAP and NTP should identify a small number of high performing districts (20-30) also considering disease burden (presence of HIV key population, number of PLHIV enrolled in care), presence of good infrastructure for diagnosis and treatment of HIV and TB, and good performance on other NAP and NTP indicators;
b. NTP and NAP should focus and direct maximum technical support, human resources, trainings and logistics to these selected districts and scale up implementation to achieve high coverage levels (100% screening/testing, 100% ART, IPT and CPT); availability of diagnosis and treatment services nearest to patients residence by covering all hospitals and Puskesmas with HIV testing services and adding more ART and satellite sites; strengthened supervision and monitoring by enhanced human resources and use of technology such as e-health or m-health to track patients and provide expert care;

c. Lessons from these pathfinder districts and champions identified in these districts should be utilized to guide and support exponential expansion of TB/HIV activities to remaining 141 priority HIV districts and 90 priority TB districts. The list of priority districts may be modified as more evidence is generated and infrastructure and resources are made available.

3. NAP and NTP should jointly intensify implementation of TB/HIV activities in priority districts by establishing decentralized and simplified HIV testing services, intensified TB screening and detection using rapid tests (e.g. Xpert MTB/Rif) and linkage of all HIV positive TB patients to TB treatment and ART.

HIV testing services

a. NAP with support from NTP to establish HIV rapid testing services in all health facilities (public + private formally engaged) and eliminate need of referral for HIV testing. Use of whole blood finger prick test should be promoted (HIV rapid tests currently used at HIV testing sites in Indonesia are noted to be compatible for testing with whole blood);

b. Ensure PITC for TB patients across all levels and types of health facilities. NTP should reflect HIV testing within the TB diagnostic algorithm to promote PITC. TB patients screened HIV positive may receive comprehensive counselling;

c. Use informed verbal consent for PITC;

d. NAP to revise content of the PITC module and develop brief HIV counselling tool suitable for use at all Puskesmas/community. Also NTP should incorporate PITC into the TB training module along with a brief counselling tool;

e. Ensure availability of free and quality assured HIV testing services at all health facilities irrespective of place of residence. Appropriate modifications in the BPJS norms may be undertaken to facilitate this. All hospitals and Puskesmas that have TB microscopy centre may be chosen for capacity building using the brief HIV counselling tool and rapid HIV testing to start with and, subsequently, staff from other Puskesmas should be trained;

f. NTP and NAP to collaborate and include TB/HIV component into all PPM initiatives at national, provincial and district levels. The preparation package (training) for this purpose should include core TB/HIV activities;

g. NTP and NAP to ensure that TB/HIV intervention package is included in the BPJS menu and develop guidance to support its implementation. The two national programmes should also jointly negotiate increased compensation for the co-infected patients.
**Intensified TB screening**

a. Develop and disseminate specific TB diagnostic algorithm for PLHIV as per WHO guidelines and ensure systematic screening at every visit based on TB signs and symptoms (cough, fever, weight loss, night sweats of any duration or lymph node enlargement);

b. NAP and NTP should provide access to Xpert MTB/Rif as first test for TB diagnosis in PLHIV. The placement criterion for Xpert MTB/Rif should include high load HIV sites considering patient load;

c. If Xpert MTB/Rif tests are not available within the same health facility, a regular specimen collection, transport and feedback mechanism should be established to ensure access to all PLHIV;

d. NAP should intensify training and sensitization of doctors and staff to promote use of Isoniazid preventive therapy as per national guidelines for all PLHIV, including those already on ARV at all levels.

**Linkage to ART**

a. NAP and NTP should jointly provide enabler support for linking 100% HIV positive TB patients to ART e.g. travel support;

b. NTP staff should closely monitor ART initiation and continuation during the course of TB treatment and systematically refer patients to ART site at the end of TB treatment for continuation of ART;

c. NTP and NAP should involve the community/health cadre engaged in respective programme implementation to support linkage of HIV positive TB patients to ART;

d. All HIV positive TB patients should be started ART, irrespective of CD4 count and within 2 to 8 weeks of starting TB treatment;

e. NAP and NTP should ensure systematic recording and reporting of ART status on both sides. This information should be cross-checked at a regular interval for completeness, preferably every quarter.

**Strengthen mechanisms for collaboration between NTP and NAP**

a. Advocate with district and provincial authorities to provide dedicated staff for supervision and monitoring of TB/HIV activities. Build capacity of Wasor, HIV programme focal person and other existing staff at province and district level in supervision and monitoring. Seek enhanced technical support from existing national and international partners;

b. Streamline flow on information on HIV status between the HIV testing and treatment sites including through the Wasor. Adopt the policy of shared confidentiality within the health system to enable information sharing with TB staff while ensuring confidentiality;

c. Strengthen supervision and monitoring. Ensure joint NTP and NAP field visits from national and provincial levels with an aim to cover all districts in a given year. Establish mechanism of monthly evaluation meetings of NTP and NAP staff to share data and plan actions at district level. Undertake TB/HIV data validation exercise by team of national and provincial staff and technical partners (at least two districts per quarter);
d. Undertake joint annual national TB/HIV review involving key stakeholders at the national and provincial level;

e. Strengthen TB/HIV interventions in prisons including providing access to GeneXpert. Encourage integration of TB/HIV interventions in the work of community workers;

f. Ensure uninterrupted availability of HIV rapid tests, isoniazid, co-trimoxazole;

g. Ensure complete recording and reporting of TB/HIV data variables on SITT and SIHA.

4. In low TB/HIV burden districts, NAP and NTP should strengthen implementation of current activities by fixing gaps in recording and reporting, logistics, simplified approach to HIV testing –PITC and track linkage of HIV positive TB patient to ART.

12. Programmatic Management of Drug-Resistant TB (PMDT)

a. Findings

Indonesia has a high number of cases of rifampicin resistant/multidrug resistant TB (RR-/MDR-TB), and ranks in the 20 highest MDR-TB burden countries in the world. The precise MDR-TB burden in Indonesia is unknown as there is no nationwide representative data on RR-/MDR-TB prevalence. Precise estimates of XDR-TB are also unknown. The NTP and NIHRD have initiated a nationwide resistance survey in 2016 with results expected in 2017. Based on data from smaller resistance surveys, the WHO estimates there could be as many as 32,000 incident cases of RR-/MDR-TB corresponding to around 10,000 cases among the notified cases (see Tables 10 and 11).

Table 10.
Epidemiology of RR-/MDR-TB in Indonesia

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>ESTIMATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>DR-TB incidence</td>
<td>12 cases/100,000 population (32,000 cases)</td>
</tr>
<tr>
<td>Estimated MDR/RR-TB cases among notified pulmonary TB cases in 2015:</td>
<td>10,000 cases</td>
</tr>
<tr>
<td>Estimated % of TB cases with MDR/RR-TB</td>
<td>2.8% (New) and 16% (previously treated).</td>
</tr>
</tbody>
</table>

Table 11.
Estimated Proportion of MDR-TB Cases among Notified TB Cases in Indonesia in 2015

<table>
<thead>
<tr>
<th>NOTIFIED CASES 2015</th>
<th>DRUG RESISTANCE ESTIMATES</th>
<th>ESTIMATED DR-TB CASES (WHO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>New pulmonary TB cases</td>
<td>295,781</td>
<td>2.8%</td>
</tr>
<tr>
<td>Re-treatment cases</td>
<td>10,325</td>
<td>16%</td>
</tr>
<tr>
<td>Extra-pulmonary TB cases</td>
<td>24,623</td>
<td>Not known</td>
</tr>
<tr>
<td>Total</td>
<td>330,729</td>
<td></td>
</tr>
</tbody>
</table>
Diagnostic capacity for drug-resistant TB (DR-TB) is steadily increasing. Up to November 2016, there were 83 Xpert MTB/RIF machines operational in 33 provinces. Currently 330 machines are in the process of placement using the Global Fund grant, with the Government of Indonesia also procuring 201 Xpert machines in 2016, with more to come in the near future. There are 16 labs for culture where 8 labs are certified for first-line DST only, and 5 labs are certified for first- and second-line DST.

A new algorithm that includes the use of Xpert as a primary diagnostic for TB for all patients with symptoms suggestive of TB was designed and disseminated to the provinces in May 2016. An interim letter from the Director General forms the basis for implementation of this new algorithm with a new ministerial decree that is to be signed soon. Xpert will also continue to be used as the primary and initial diagnostic for DR-TB. The addition of it being used as a diagnostic tool for drug-susceptible TB (DS-TB) will increase the number of cases of DR-TB found. There was no data on average turn-round time from the request of Xpert testing to the return of results to the ordering facility; however, all JEMM teams reported the system specimen transport and reporting not well functioning and with delays. In addition, in most cases patients are requested to travel to the Xpert testing site rather than sending a specimen. Furthermore, all teams reported low utilisation of the new Xpert algorithm.

According to NTP data (from eTB Manager) average turn-around time of DST is 81 days (median 77 days); however, this is based on the time the specimen spent in the laboratory and does not include specimen transit times or time taken to return results back to the treatment centres, or entry into eTB Manager. The NTP has conducted the piloting of specimen transportation in 9 provinces using a courier mechanism. The guideline for specimen transportation has been finalized.

PMDT services are offered in a fraction of health care facilities in centralized centres called “PMDT Referral Hospitals” and “PMDT Treatment Centres” with DOT of the regimens being decentralized to identified “treatment satellite sites”. As of end of 2016, the PMDT services have expanded to 35 PMDT referral hospitals, 57 PMDT treatment centres (previously call “sub-referral centres”) and 1,238 Treatment sites (treatment satellite) in 33 provinces. All patients are started at the PMDT Referral Hospitals or PMDT Treatment Centres and after it has been documented the patient is tolerating the treatment, treatment under clinic-based DOT is arranged at a satellite site, often a puskesmas, close to the patient’s residence. Some patients prefer continue care and DOT at the referral and sub-referral level for their whole treatment, and this option is available. Most patients do not require hospitalization for the start of treatment. The satellite site (usually a puskesmas) does the bulk of the DOT, which is clinic-based DOT (the patient travels to the clinic daily for the DOT). The monthly follow-up visits and all follow-up examinations and tests (smear, cultures, blood laboratory tests, hearing tests and specialty consults) and outcome assignments are done through the PMDT Referral Hospitals and PMDT Treatment Centres. Basic adverse events are managed by the satellite sites with more complicated adverse events and regimen adjustment done at the PMDT Referral hospitals and PMDT Treatment Centres. Only the PMDT referral hospitals have Clinical Expert Teams (CETs). The staff at the satellite sites that supervise the outpatient treatment are generally under-trained in the management of DR-TB. A number of grassroots patient support groups help patients adhere to treatment, but most of these groups are underfunded.
Enrolment numbers are low (Figure 18) and outcomes are sub-optimal with a success rate in the low 50 percentage range for most years (Table 12). The program is enrolling only 1,848 cases out of the 10,000 notified cases (18.5%), or 6% of the estimated 32,000 RR-MDR-TB cases that occur annually.

**Figure 18. Total Number of DR-TB Patients in Indonesia 2009-2016**

![Graph showing the total number of DR-TB patients in Indonesia from 2009 to 2016.](image)

**Table 12. Outcomes of DR-TB Treatment, 2009 – 2016**

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of cases</th>
<th>Cured (%)</th>
<th>Complete (%)</th>
<th>Defaulted (%)</th>
<th>Failed (%)</th>
<th>Deaths (%)</th>
<th>Not evaluated/other</th>
<th>Still in treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>19</td>
<td>52.6%</td>
<td>-</td>
<td>-</td>
<td>10.5%</td>
<td>10.5%</td>
<td>15.8%</td>
<td>0%</td>
</tr>
<tr>
<td>2010</td>
<td>140</td>
<td>62.9%</td>
<td>5.3%</td>
<td>10.7%</td>
<td>4.3%</td>
<td>12.9%</td>
<td>4.3%</td>
<td>0%</td>
</tr>
<tr>
<td>2011</td>
<td>255</td>
<td>56.5%</td>
<td>1.6%</td>
<td>25.1%</td>
<td>1.2%</td>
<td>15.3%</td>
<td>0.4%</td>
<td>0%</td>
</tr>
<tr>
<td>2012</td>
<td>432</td>
<td>53.5%</td>
<td>1.2%</td>
<td>26.9%</td>
<td>3.2%</td>
<td>15.3%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2013</td>
<td>820</td>
<td>48.8%</td>
<td>1.3%</td>
<td>28.7%</td>
<td>3%</td>
<td>16.7%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2014</td>
<td>1,301</td>
<td>43.4%</td>
<td>2.4%</td>
<td>27.1%</td>
<td>2.2%</td>
<td>17.3%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>2015</td>
<td>1,590</td>
<td>6.9%</td>
<td>0.2%</td>
<td>24.7%</td>
<td>2.3%</td>
<td>14.2%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>2016</td>
<td>1,848</td>
<td>0%</td>
<td>0%</td>
<td>9.5%</td>
<td>0.3%</td>
<td>8.7%</td>
<td>1.2%</td>
<td>80.2%</td>
</tr>
</tbody>
</table>

An electronic medical record (EMR), eTB Manager, is being used to monitor and evaluate the patients. In addition, it is being used as a clinical chart. It is functioning well but the JEMM teams observed limited access to it by satellite treatment sites. Linking Xpert MTB/RIF Alert and eTB Manager is in progress. This link will enable automatic notification from Xpert MTB/RIF machines equipped with Xpert MTB/RIF Alert System to eTB Manager. Plans are also underway to link eTB Manager with the national medical information system (MIS).
(Further expansion of the Alert system to include all Xpert results is recommended in Section 9, Recommendation 4.d.).

A national action Plan for PMDT 2016-2020 has been updated and exists in draft form. Highlights of the plan are to scale up PMDT care aggressively with the following 2020 goals:

- At least one PMDT Referral Hospital or PMDT Treatment Centre in all 514 districts/municipalities.
- Over 2000 operating Xpert machines that will performing over 4.5 million Xpert tests per year.
- A completed transition to the short regimen (transition to start in full force mid-2017) and the use of the new TB drugs bedaquiline and delamanid for cases that cannot take the short regimen.
- A more capable and skilled staff for the management of MDR regimens.
- Multiple options of managing MDR-TB that include better engagement with private hospitals and more options in the public sector for decentralized clinic-based and community-based care.

b. Challenges

There are ambitious plans in place for the scale up of PMDT with many challenges to be overcome. These challenges include:

- **Scaling up the use of Xpert.** Xpert testing is underutilized. The new algorithm for Xpert that was intended to be implemented starting in May 2016 has not yet been successfully rolled out. It was estimated that less than 50,000 Xpert tests were performed in 2016 and it will be a significant challenge to reach the target utilization of 1.6 million tests in 2017.

- **Second-line DST for all patients with RR-TB/MDR-TB.** Second-line phenotypic DST is being done on very few MDR-TB patients. Line probe assay (LPA), a rapid molecular test, for second-line DST is not yet operational. The country plans to have 2 sites operational by mid-2017. Two LPA sites could perform the needed amount of tests for 2017; however the country wide specimen transport will prove challenging. LPA DST to second-line drugs is extremely important for identifying who gets the shorter MDR regimen and who gets new TB drugs.

- **Decreasing default of patients on MDR regimens.** High early loss to follow up of Xpert rifampicin resistant TB (RR-TB) positive patients (approximately 25%) is quite common at most sites. The reasons vary from patients refusing treatment because of fear of adverse events, died before treatment, and simply lost to follow up. It is unclear if one cause is the health staff not explaining the treatment properly. Another 25% get lost to follow up during treatment. The sputum and specimen transport system is weak, as is getting test results back to the clinician caring for the patient. Resources and systems to do home visits to defaulting patients are often not available. The financial support of IDR 750,000 per month is not always enough for the extremely poor and vulnerable, and can take months to get to the patient.
• **Management of care of the patients on MDR Regimens needs improvement.** Adverse effects for patient on MDR-TB treatment are not aggressively managed. The Puskesmas staff are insufficiently trained to manage MDR-TB patients. There are long delays in culture results getting into the patient’s chart, which is essential for monitoring effectiveness of treatment. A transition to the shorter MDR regimen is planned for June 2017, but guidelines, training material and changes to the MDR-TB forms are not yet finalized. Most important, in management of care, communications between Clinical Expert Teams (CETs), referral and treatment centres, and satellite sites that treat patients is sub-optimal.

• **Miscellaneous challenges.** Contract tracing for MDR-TB cases are low. Infection control is not optimal on open wards in hospitals and in some waiting areas.

c. **Recommendations**

1. **The NTP should finalize and implement the National Action Plan on the Programmatic Management of Drug-resistant TB (PMDT), version January 2017.**

   a. The action plan includes incorporating all WHO endorsed tools to fight MDR-TB including modern molecular diagnostics, decentralized treatment, new shorter MDR regimens, new anti-TB drugs bedaquiline and delamanid for patients not able to receive the shorter MDR regimens, and a robust system of management, supervision and monitoring;

   b. The Action plan should be costed and supported by stakeholders and GoI MoH;

   c. The system of human resources to implement the plan should be reviewed and appropriately put in place.

2. **Provinces and districts should improve and scale up the diagnosis of DR-TB, the monitoring of cultures and DST to isoniazid and second-line drugs.**

   a. Continue to scale up the use of Xpert as the initial test to determine DR-TB and implement the new diagnostic algorithm at all Xpert sites;

   b. Increase number of Xpert sites per the PMDT National Action Plan (approximately 1000 Xpert MTB/RIF machines employed and 2.3 million test performed in 2018; 2000 Xpert MTB/RIF machines employed and 4.5 million test performed in 2020);

   c. Perform Xpert in all hospitalized patients with respiratory symptoms (this recommendation will help with infection control and case finding for both DS-TB and DR-TB);

   d. Establish a robust network of sputum/specimen transport to Xpert facilities and referral laboratory with a system of reporting results back to the ordering facility. This should be done for Xpert (using GeneXpert Alert (see section 9)), monitoring cultures, and DST.

   e. Perform second-line DST in all patients with RR/MDR-TB.
3. **The NTP should modify treatment regimens to be up-to-date with the latest WHO 2016 Guidelines on treatment of DR-TB.**

   a. Update all PMDT guides for new shorter MDR regimens (and the use of new TB drugs bedaquiline and delamanid when MDR shorter regimens cannot be used);
   
   b. Implement the new shorter MDR regimen in patients with contraindications to it and individualized regimen in patients with contraindications;
   
   c. Fast track the regulatory approval for delamanid use in Indonesia. (Suggested protocols for the use of new TB drugs will be provided in the rGLC PMDT Monitoring Report done during the JEMM 2017).

4. **Provinces and districts should improve the system of treatment delivery and management of the patients on MDR regimens.**

   a. Continue with the structure of the core PMDT program treatment with strengthening of all systems associated with it;
   
   b. Establish at least 1 PMDT Referral Hospital or PMDT Treatment Centres in all 514 districts/municipalities as soon as possible, consider accelerating the PMDT National Action Plan that only reaches this goal in 2020;
   
   c. Provide regular refresher training to the PMDT Referral Hospital or PMDT treatment Centre staff with an emphasis on roles and responsibilities;
   
   d. Re-design the way a satellite site gets trained and manages MDR-TB patients;
   
   e. Consider more provisions for community-based DOTS;
   
   f. Improve communication between the Clinical Expert Teams (CETs), PMDT Referral Hospital or PMDT treatment Centre, and PMDT satellite sites;
   
   g. Consider increasing the IDR 750,000 monthly support for all PMDT patients and consider an additional social support package for the extremely poor and vulnerable patients;
   
   h. Improve the communication and (socio) economic support to the patients newly diagnosed with DR-TB to ensure that all those diagnosed are also put on treatment and remain on treatment.

13. **Procurement and drug supply management**

   a. **Findings**

   There are two mechanisms for TB program drug procurement (Figure 19). First line drugs (FLD) follows the e-catalogue or e-purchasing, using government funds/APBN. The e-procurement system consist of drugs sourced from manufacturers within the country and the process is managed by FARMALKES. While Second line drugs (SLD) and other commodities not funded by the government but through the Global Fund, are procured using the Special Access Scheme (SAS) through the Global Drug Facility (GDF) mechanism.

   There was no episode of stock out of FLDs or SLDs in the past 12 months. However, pockets of stock out of INH 100mg & 300mg were noticed in some facilities while other facilities used INH 300mg in place of INH 100mg for the prophylactic treatment of children.
Generally, good infrastructure exists for the storage of medicines, however, the central warehouse used for the storage of SLDs and diagnostics has an inadequate storage area. Also, it was noted that some dispensing areas (where medicines stay up to one week) had no temperature monitoring equipment and poor ventilation was observed.

The pharmacies have a separate system for recording and reporting drug stocks (e-logistics for pharmacy) and this doesn’t connect automatically with SITT for FLD program reporting and eTB Manager for SLD program reporting. Data for lab commodities are not captured in any of these systems.

b. Challenges

- The daily treatment recommendation is not followed because the drug formulation (Rifampicin 150mg/Isoniazid 75mg) for daily dosing is unavailable. Local manufacturers are not producing it and building the capacity may take 2-3 years from product development to registration.

- Some specialists at the treatment facilities still prefer to use single anti-TB formulations over the fixed dose combination (FDC). Some are of the view that single formulations still yield better clinical outputs than the FDCs.

- The targets set for treatment of DR TB patients for 2017 and 2018 are 2.8 and 5 times, respectively, more than the cases in 2016. (DR TB patients target to treat, 2016: 4,000 patients (1,800 actual enrolment); 2017: 5,200 patients; 2018: 10,500 patients). This poses a challenge in quantification of medicines because if the targets are not met, the medicines, with their short expiry dates, would be at risk of expiration.

- Logistics data monitoring and analysis are weak and the SITT electronic system is not good at re-organising data so it could be used for decision making. There is a form for reporting and requesting first-line medicines but, there is no analysis of drug consumption, months of stock remaining, max/min stock levels, or buffer levels for drug quantification.

- Based on findings from field visits, there were variable supplies of medicines and laboratory commodities in the country. Some areas are experiencing shortages while some have sufficient stocks. This indicates a challenge in distribution.
• There is weak collaboration and implementation of the regulation for medicine sampling and quality testing at public facilities.

• There are insufficient human resources at the NTP national level to manage TB logistics - procurement, warehousing, inventory, and distribution.

• Monitoring and supervision of supply management activities at all levels is very weak.

c. **Recommendations**

1. **The MoH should make available the daily regimen formulation, fixed dose combination (FDC) Rifampicin 150mg /Isoniazid 75mg, to introduce and implement the daily treatment through:**
   a. Exploring immediate drug procurement by the Special Access Scheme (SAS) from international quality-assured supplier, while building the capacity of the local manufacturers;
   b. Immediately plan and coordinate with the stakeholders (NTP, BPOM, FARMALKES, manufacturers, etc) to build the local capacity to produce the FDC daily regimen. Consider facilitating expedited processes from product development to registration while ensuring quality assurance and quality control procedures;
   c. Prepare a phase out plan for the intermittent treatment regimen with minimal wastage.

2. **The MoH should explore regulation to control the sales of single, loose TB medicines to promote FDCs which provide convenience to patients and simplify supply chain management. They should organize a stakeholders meeting, including engaging the medical and pharmacy associations, to review the feasibility based on current policies.**

3. **The NTP should conduct careful quantification, forecasting and procurement of medicines taking into account the program targets and the realistic achievable targets of DRTB patients to treat, to avoid overstocking and expiration of medicines; the MoH should monitor the drug situation at least quarterly through early warning system and adjust medicine orders and delivery schedules when needed.**

4. **The NTP and FARMALKES should build capacity and institutionalize the use of QuanTB tool for forecasting, quantification and early warning system of first line and second line TB medicines.**

5. **The NTP should ensure appropriate and equitable distribution of medicines and supplies across all levels based on analyzed months of stocks and estimated target patients.**

6. **The MoH should strengthen quality assurance/control (QA/QC) procedures by establishing a working group on quality of medicines to have a platform to review QC testing results and implement recommendations. Moreover, they should pursue WHO prequalification of local TB medicine suppliers through the assistance of USAID.**

7. **The NTP should build up the capacity of the national PSM team and the storage space for SLDs and PMDT commodities by exploring a bundled package for the storage, inventory, packaging, and security services for the SLDs management.**
long run, it should prepare the transition of storage from contracted private space to FARMALKES warehouse.

8. The NTP should develop a PSM action plan for the phase in/phase out implementation of Shorter MDRTB treatment and new TB drugs. The national PSM team should closely monitor the quantification, supply planning, monitoring consumption and procurement, while also ensuring smooth decentralization of medicines from central warehouse to the puskesmas level, engaging district levels in storage and distribution of second line and new TB drugs.

9. The NTP should strengthen the relationship between the TB program and the pharmacy in monitoring and encouraging appropriate action in drug management, by engaging pharmacists in TB program activities and strategies.

14. Monitoring and evaluation, health information systems, vital registration

a. Findings

The recording and reporting system in Indonesia is based on WHO-recommended 2013 recording and reporting framework with electronic quarterly reporting of case-based data in SITT. Roll out of SITT began in 2014 using three approaches;

- Approach 1 – district level case-based data entry into the offline form of SITT and uploaded to online per quarterly by district supervisors (wasors) for all health facilities they are responsible for (for when there are neither data entry capacity, nor internet access at the health facility);
- Approach 2 – health facility case-based data entry into the offline version of SITT, wasors collect data from facilities they are responsible for and upload into SITT quarterly (data entry capacity exists, no internet access at the health facility);
- Approach 3 – health facility case-based data entry into the offline version of SITT, data uploaded into SITT quarterly (both data entry capacity and internet access exist at the health facility).

Cases of MDR-TB are recorded electronically in eTB manager which is also used by the five national reference laboratories to manually record results from GeneXpert, culture and DST. There is no link between eTB manager and SITT although 2 matching applications have been developed which pick up direct matches between SITT and eTB manager as well as SIHA, which is the electronic recording and reporting system for HIV and ART. All laboratory results at microscopy labs are recorded on paper and GeneXpert results are not collated nationally electronically.

No national vital registration system exists. Even though hospital deaths are recorded, ICD-10 coding is not routinely used and deaths in the community are not captured. Even where ICD-10 coding is used there is evidence to suggest that TB is not always recorded as the causes of death mentioned are often based on the disease which will lead to the highest compensation payment by JKN (national insurance company). A sample registration system (SRS) has existed since 2012 which was originally funded by the Global Fund and established by NIHRD. 10,000,000 individuals were observed under the survey which included 30
provinces, 119 districts and 128 sub-districts. Death certificates were filled in by primary health care staff who had been trained in ICD-10 coding and determined the cause of death in community deaths through verbal autopsy.

b. Challenges

The TB surveillance system has some strengths but also important gaps that need urgent action. Of all the standards for TB surveillance, 4 were met, 1 was partially met and 7 were not met (see the separate epidemiological review for details). Based on the assessment, the greatest strengths of TB surveillance include a skilled and dedicated national team with capacity to manage large datasets, carry out epidemiological analysis and further develop the electronic surveillance system. The NTP produce an epidemiological annual report and have developed a training module for provincial and district staff on M & E and analysis, including training on STATA and GIS at the provincial level. There is clear guidance and documentation for recording and reporting and data collection tools are consistent with international reporting and capture the minimum dataset. Over the next two years there is a clear plan for improving SITT which includes the integration with eTB manager (SITB) and SIP/DHIS2 (Indonesia’s future single health information system) which will be supported technically and financially by Challenge TB. An android application is currently being developed for DS-TB and piloted in the private sector by IRD which is in line with TB recording and reporting tools. eTB allows for electronic surveillance of MDR-TB cases on treatment in real-time and there is a sentinel surveillance system for DR-TB and a planned DRS. An inventory study to measure under-reporting has also commenced and a prevalence survey was completed in 2014. Reporting of TB is now mandatory by law but this is not yet enforced.

The primary challenges of the overall system include the inappropriate storage of aggregate national TB surveillance data and no single national database, which makes attempts to carry out time series analysis cumbersome. The team also have no analysis plan or experience in analysing the case-based data from SITT and the export of data is not user friendly. There is under-reporting from districts (25%) and no monitoring of timeliness of reports or active follow up. This situation has remained unchanged in Papua since 2013 with no efforts to resolve it.

SITT has several major issues including bugs and design flaws, the most serious of which include the inability to record cases without sputum results, and retreatment cases that are smear negative, and calculate age on the date of data entry and birth date - it places cases in the incorrect age cohort when data is entered late. These issues have now been resolved for the next version which will be released in March, 2017. Errors in uploading data and poor internet connectivity have led to both deletion of data and records and there is now widespread mistrust of the system by users. There is no use of national unique identifier which currently means deduplication of cases or linkage to other databases, including laboratory data, are not feasible. The national ID NIK has been introduced into the next version of SITT but completion of this field will have to be encouraged through training and/or making it mandatory. The development of SITT is slow due to insufficient staff and no project manager. If unresolved, this will get worse as plans start to integrate the system with eTB manager and SIP.

One of the major issues with the current surveillance system is that cases are not captured from hospital wards, paediatric units, the private sector and the military hospitals, and the burden
in these facilities is unknown. Furthermore, in public hospitals a proportion of patients are being treated with non-programmatic drugs and are also not reported to the TB programme. The current TB register is based on patients starting on treatment which means that initial defaulters and those who die before starting on treatment are also not captured. There is no mechanism to follow up referred or transferred out cases and this, combined with a lack of unique identifier and no linkage to lab data, means that it is virtually impossible to know whether cases bacteriologically confirmed by the laboratory actually receive treatment or not.

Accuracy of data was found to be questionable in the field with no systematic quantitative data quality or validation checks at the district level, no data quality indicators and no standard operating procedures, tools or template for monitoring data quality at any level. Definitions were not readily available at clinics and due to high staff turnover and a lack of routine training there were serious misunderstandings on case definitions, particularly in relation to retreatment cases, which may explain why such a low proportion of cases in the country have a treatment history. Old recording and reporting forms remain in circulation resulting in missing data for GeneXpert and HIV status. Training gaps are evident at the district level and when combined with the lack of a district wasor, or TB officer, dedicated to TB, and no routine M & E meetings, supervision is consequently infrequent and inadequate. This situation has been primarily caused by insufficient budget allocation to TB by districts. Although provincial staff have been trained in data analysis very few have used these skills in practice. It appears that this task is instead carried out by district wasors who have not been trained and have limited skills for data analysis and interpretation.

TB in children appears to be adequately diagnosed and reported based on the two indicators where the expected proportion of all cases that are children should be between 5-15% and the ratio of 0-4 : 5-14 year olds should be between 1.5-3. Since it is clear, however, that there is significant under-reporting from paediatrics and the private sector it is unlikely that all cases are treated and captured. Only 11% of cases have a known HIV status and HIV testing is inadequate, as is starting co-infected patients on ART. There is no routine contact tracing and although information on MDR-TB cases is collected in real time there is almost 30% lost to follow up with no resulting public health action. Unless this situation is tackled with urgency there is a real potential for increased and undetected MDR-TB transmission both in households and community.

c. **Recommendations**

*Short term*

1. **Data analysis and data use for policy, planning and programmatic purposes**

The NTP should:

a. Capture all historical, aggregate, sub-national level TB data into the WHO DHIS2 platform in collaboration with Pusdatin;

b. Hold an in country data analysis workshop on Understanding and Using TB data and using the dashboards of the WHO DHIS2 platform to analyse and use subnational data for action. The workshop will include data cleaning, case based data, TB-HIV and MDR-TB for national and provincial level staff (outputs: standard template for analysis,
do files for data cleaning and analysis, monitoring of epidemiological indicators). Technical assistance can be provided by WHO;

c. Conduct annual analysis workshops using the dashboards of the DHIS2 platform by provinces for district staff;

d. Define appropriate district and provincial indicators that are adopted as the district and province specific TB targets.

2. **Electronic case-based recording and reporting TB surveillance and laboratory systems**

The NTP should:

a. In full agreement with short-term recommendations from a national stakeholders’ meeting in December 2016, make necessary fixes to SITT and eTB (e.g. 0 TB case reporting, unique ID, data export), then set up the SITB, then address development of a TB module in SIP (See Figure 20). Technical support can be provided by Challenge TB;

b. At national level, recruit a dedicated IT staff and project manager for SITT/eTB/SITB/SIP/DHIS2 (development and collaboration with pusdatin, clear timelines) and create an IT unit;

c. Obtain an additional server for training and testing purposes;

d. Immediately use new forms in the field and update them as the system progresses, which requires a central budget line;

e. Develop adequate guidelines and provide training provided as development of the system progresses;

f. GXalert (an automatic system for collating results from a network of GeneXpert machines) should be introduced and results analysed routinely.

**Figure 20. Short-term and Long-term Graphic Illustration of Planned Improvements to the M&E System for TB**

Source: JEMM team member (L Anderson)
3. **The NTP should improve direct measurement of TB burden by:**
   a. Deduplication exercises introduced within SITT/eTB databases (direct) and in annual cleaning (probabilistic);
   b. NIK introduced as a mandatory field with an option of “not available” and completeness should be monitored over time; NIK should be added to, and completeness improved in, SIHA, eTB manager and lab forms;
   c. Record linkage exercises with available national databases for TB patients (e.g. BPJS);
   d. Existing SRS TB data analysed to improve understanding in TB mortality;
   e. TB R & R tools provided in all hospitals, paediatric units, clinics with non-programmatic drugs, military hospitals and prisons which the TB officer/district wasor should capture in SITT (add option for non-programmatic drugs and inpatient);
   f. The TB treatment register capturing cases who do not start on treatment due to initial default or death (add option to TB register and in SITT e.g treatment start date OR did not start treatment with reason > automatic treatment outcome). This should be monitored by the district wasor as part of supervision. In some districts this information will only be available at the lab and lab registers should have the ability to capture *puskesmas* cases referred from or to;
   g. The results from the pilot of the tool developed by IRD for data capture in the private sector should be evaluated and if successful the implementation of the tool should be expanded to all private facilities and a link should be formed with SITT, carry out a Drug Resistant Survey.

4. **To improve quality of TB recording and reporting, the NTP should:**
   a. Collaborate with Litbangkes on Rifaskes and “healthy family” quality and readiness 2017 assessment that will include TB;
   b. Develop a poster on M & E/data flow and case definitions to be displayed in the *puskesmas*;
   c. Carry out quarterly meetings between facility and district/district and province for M & E;
   d. Recruit a district wasor and/or TB officer dedicated to TB;
   e. Develop a quantitative supervisory checklist to be used quarterly by the district wasor either at meetings or in the *puskesmas*;
   f. Develop a data quality report with key indicators in SITT which can be used by the province and the district to monitor quality over time and provide feedback;
   g. Conduct refresher training in M & E at the district level;
   h. Develop standard data cleaning queries at the national level for final annual data cleaning for the annual report and global reporting;
   i. Recruit staff dedicated to data entry and follow up of referred and transferred out cases at busy hospitals, *puskesmas*’ and districts;
j. Improve data validation in eTB manager;
k. Develop data cleaning SOPs at all levels;
l. Complete the inventory study and take action to decrease under-reporting based on the results.

Long term – The future of the electronic case-based recording and reporting surveillance system in Indonesia

5. The NTP should

a. In full agreement with recommendations from national stakeholder meeting in December 2016: develop the SITB module (DS and DR-TB) in SIP, data entry by pusdatin at puskesmas level;
b. Additionally, the NTP, in collaboration with the national reference laboratories should establish an eR&R system in the lab that can be linked with TB surveillance system;
c. The NTP in collaboration with the national reference laboratories should continue and expand the sentinel surveillance system which includes new and retreatment cases;
d. The NTP in collaboration with IRD should move away from a project-based SRS; approach to a robust, national system, and support development of a high-quality vital registration system with standard coding of cause of death, thus improving direct measurement of TB burden.

15. Civil society involvement and community engagement

a. Findings

Community engagement, empowerment of patients and effective involvement of CSOs can play a major role in significantly addressing challenges of low case notification, early diagnosis and initiation of treatment which in turn will make a difference in the treatment outcomes, address issues of high loss to follow up and high number of deaths.

Based on the Ministry of Health Regulation No. 65, 2013, Guidelines for the Implementation and Development of Community Empowerment for Health, the main focus areas are:
a) promote behavioral change and self-reliance to live clean and healthy, b) increase self-reliance in early warning systems, mitigation of the health effects of the disaster, as well as the outbreaks, c) improve the coherence of community empowerment in health by income generating activities.

The NSP 2015-2019 has a clearly articulated section on community engagement. In the NSP 2016-2020 improving this engagement is part of the 8 strategies, with a focus on the two important issues of empowering the community and ensuring community participation. However, the lack of clear implementation plans and the ‘how to’ are concerning.

Patient support groups like PETA, Semar, Madupahat and the recently formed umbrella group POP TB Indonesia, have proved to be good replicable models in supporting treatment adherence, and counselling, and, if strengthened, can generate the much needed demand.
There are many CSOs in Indonesia involved in TB care, however only 27 of them feature in the NTP radar. Aisyiyah is one, which is the GF PR for community engagement, working in 25 provinces and 160 districts. Some CSOs provide nutrition and/ or psychosocial support to patients.

The inclusion of the TB initiative, Ketuk Pintu, in the Dengue initiative, Jumantik, could be a good method especially if the messages are kept simple and clear.

We saw initiatives involving the religious leaders that can be made more effective by providing the right information and messages.

b. Challenges

Community empowerment to ensure meaningful participation in the TB response is a cross cutting need. The challenges of the missing persons with TB symptoms, the huge numbers seeking care in the private sector, the self-diagnosis and seeking care with the traditional healers, a lack of ability to demand the right care, all stem from a community that is not empowered with the right information, and a lack of mechanisms to follow the right pathway to care.

Empowering communities needs empowered cadres who are the first point of contact for the community members. Investing in establishing an informed, committed, enthusiastic and empowered cadre system will address many barriers to care.

Good initiatives by CSOs need to be identified, piloted and scaled up. The inclusion of TB in the Dengue initiative of ‘Ketuk pintu’ could be a good method especially if the messages are kept simple and clear.

Engaging with CSOs

There is very limited collaboration between the NTP and CSOs on the whole and, most importantly, limited involvement in the planning and monitoring aspects. Both the NTP and CSOs work in parallel with little scope for collaboration. The capacity of the CSOs is limited though there is great potential among CSOs for scaling up to complement the NTP for better outcomes.

There is limited creative, user friendly training material with common messaging. Some CSOs have developed their own, which are good, but the messages on TB need to be standardized. Lack of recording and reporting formats and mechanisms for the contribution of the CSOs means that their contribution is not reflected in the NTP reports.

38 A health cadre is a member of the society/community who is active and trained to support the local Health Centre in TB prevention and care on a voluntary basis. They are trained by the Health Authority or CSO/NGOs. Their role is to a. provide TB education through activities in the community, b. find people with TB symptoms in their area and refer them to the health centers; and c. help health center, or other health facility, in guiding and motivating treatment observers and patients. Cadres are the first point of contact in the community. This is the weakest link in the whole TB response. They are either not paid or paid very little. There is no other compensation either such as performance based incentive or non-monetary incentive. They are seen as tools to bring in people with symptoms. Building their capacity would enhance trust from the community, improve adherence, and reduce further spread of the disease.
Community Empowerment and Participation

The affected community and the patients are to a large extent mere passive recipients of care. Most of them are from marginalized backgrounds and disempowered. Stigma and discrimination continues to be high and is a huge barrier to seeking care. While the NSP recognizes this as a challenge there are no stigma reduction strategies in place.

A patient centred approach, with simple, close to the patient solutions where all services are accessible to those who need them and delivered in a manner that upholds the dignity of the individual at all stages needs to be adopted and implemented urgently. This approach should keep the patients at the center and devise mechanisms to reduce the burden on them. The capacity of all care providers at different levels needs to be built to enable a paradigm shift which puts the patients at the center.

c. Recommendations

1. The NTP should develop a robust and strategic implementation plan, specific SOPs and guidelines for implementation, with clarity in the roles and responsibilities of each stakeholder.
   a. The MoH should invest in building the cadre system for TB either by training new cadres or by building capacity of existing cadres in TB, making sure that there is at least one cadre for 1,000 households;
   b. TB cadres’ time and contribution needs to be valued and paid for. The NTP should explore the village resources under the ‘Dana Desa’ system for incentives to the cadres. This could also be performance based.

2. The NTP should invest in a specific programme for training of, and technical assistance to, CSOs. This programme would:
   a. Strengthen institutional and technical capacity of CSOs, especially in advocacy skills and developing proposals, to help secure sustainable funding;
   b. Develop broad guidelines for effective capacity building through standardized training for different stakeholders with flexibility for CSOs to develop their own material;
   c. Develop simple training modules for training the cadres;
   d. Develop creative and attractive communication material on TB information and messages for raising awareness in the community.

3. The NTP should ensure participation of CSOs, CBOs and members of the affected communities in the planning and monitoring of the program and establish a mechanism for recording and reporting to ensure contribution of CSOs is reflected at every level, along with a referral mechanism.

4. To provide patient centred care and better empower patients the NTP should:
   a. Strengthen engagement of cured DS and DR TB patients in patient support groups and buddy system;
   b. Provide correct information about TB to alleviate fear and stigma reduction;
c. Provide psychosocial, nutritional and financial support to all TB patients;
d. Scale up and strengthen peer support groups – linking patients with existing groups, both for DR and DS TB;
e. Reduce stigma by removing blame from patients and use of non-discriminatory language;
f. Provide and strengthen counselling training to all HCW dealing with TB patients.

16. Childhood TB and contact tracing

a. Findings

Indonesia had over 600,000 cases of TB that were unaccounted for in 2015 - that is they had unknown outcomes and unregulated treatment, if treated at all. This creates a high risk of ongoing TB transmission to young children, who are vulnerable to infection and progression to disease.

TB in children has been an area of focus for the Indonesian National TB program since 2005 and has been included in the Joint External TB Monitoring Missions (JEMM) since 2011. The estimated incidence for children 0-14 years in Indonesia is 75,000 according to the latest Global TB report. However children with TB contributed 8.5% of the total notified TB caseload in 2015 with 28,418 children reported. This number has shown a downward trend and only 25,088 children were reported in 2016 (Figure 21). A declining trend in child TB notification was also noted during JEMM field visits at provincial and facility levels. Overall 8 provinces contributed to 74% of child TB notification in Indonesia in 2016 (Jawa Barat, Jawa Timur, Jawa Tengah, DKI Jakarta, Sulawesi Selatan, Sumatera Selatan, Sumatera Utara and Banten) with a wide variation in notification rates between all provinces (1.2% to 14%).

Figure 21. Notifications of Childhood TB by Age Group, 2014-2016

Source: Indonesia TB07 data and Childhood TB benchmarking tool Indonesia (2016)
Children under 5 years age comprise almost half the total notified between 0 and 14 years, which in the absence of systematic TB contact evaluation, represents passive case finding and demands urgent implementation of contact management programs. The high disease prevalence found in adolescents in 2015 also demands a focus on this vulnerable group. Of all children notified, 8% were smear positive and only 12% had extra-pulmonary TB. There were no treatment outcomes recorded in treatment registers or among those notified. MDR TB is rarely diagnosed in children (5 cases were treated in the period 2014 - 2016).

Indonesia is committed to the End TB strategy and has developed a National Strategic Plan (2015-2019). In response to the SDGs, the Government of Indonesia has set the strategy of the Healthy Community movement (Gerakan Masyarakat Sehat-GERMAS) with availability of standardized treatment for TB being one of the 12 indicators for a Healthy Family.

There is an urgent need to implement enhanced child TB case finding and prevention, access to quality diagnostics and effective TB treatment within the evolving health framework of Indonesia.

Achievements

- A Child TB working group was founded in 2005 and achieved improved TB notification in children (2011). This group has recently evolved to a Child TB Technical Working Group with representation from the NTP, Child Health Program, The Indonesian Pediatric Society (IDAI) and partners. It is due to be legalized by the Director of Communicable Diseases’ decree;
- There is a Child TB focal person in NTP and Child TB champion pediatricians have been identified in all provinces;
- Child TB National Guidelines have been revised recently and include updated algorithms for diagnosis (including the use of an updated symptom based scoring chart to diagnose child TB when CXR and/or tuberculin skin tests (TST) are not available, algorithms for MDR-TB and perinatal TB);
- National level trainings of trainers have been conducted recently for 2 pediatricians and a program manager each from all provinces (20 provincial workshops have been conducted);
- 7 early implementer provinces for IPT/contact management have been selected however progress has been slow;
- TB symptom screens have recently been integrated into IMCI modules and in MCH clinics although they are not implemented yet.

b. Challenges

- Based on Dodd et al’s modelling work\textsuperscript{39}, children comprise at least 12% of the total TB incidence, which suggests that the country has only reported 21% of the estimated burden in children;
- The number of children treated for TB in the private sector is unknown;

• Children are usually diagnosed at the hospital or secondary health care levels, are often hospitalized and labelled as “complicated cases” to qualify for health insurance reimbursement (as simple TB management is not supported by JKN at the hospital level) and maybe more likely to be lost to follow up (based on field visit observation);
• There is no mechanism to track children diagnosed with TB who are referred to primary level;
• The updated child TB guidelines are not available at primary and secondary levels;
• Child TB outcomes are not recorded or reported;
• Systematic contact management of children exposed to TB at home is not taking place;
• Recording tools are not available and Isoniazid in 100 mg tabs are not always available;
• Access to Xpert is limited to PMDT hospitals, CXR and TST are not available at primary level, TST capacity is rarely available at secondary level;
• Pediatric FDCs are widely available but often not used\(^{40}\);
• MDR TB is rarely diagnosed in children as Xpert is rarely used for TB diagnosis;
• Monitoring and evaluation of childhood TB - and links with clinical experts - are negligible.

c. Recommendations

Case finding

1. **We strongly recommend the NTP to put the specific child TB case finding and IPT targets set for 2020 (in the National Strategic Plan 2015-2019) back into the draft NSP 2016-2020, and ensure inclusion in the District TB Action plans as well. They would serve to catalyze case finding and prevention at all levels of the pediatric cascade. Case finding strategies should include:**

   a. TB symptom screens by trained screeners at high volume Puskesmas, Lung clinics, malnutrition clinics, HIV clinics, EPI clinics, MCH clinics and pediatric wards;
   b. Enhanced child TB suspect identification and diagnostic capacity (CXR) and declaration of certain *puskesmas* in each district as “Child TB Puskesmas”. The other *puskesmas* can refer child TB suspects to these “Child TB Puskesmas” or to a secondary health facility, whichever is convenient to the family;
   c. Community awareness building through communications campaigns, CSOs and trained cadres about TB symptoms in children and adolescents and the need to prevent disease in children in contact with TB at home, through evaluation and IPT;
   d. Improvement of linkages, within hospitals as well as between hospitals and Lung clinics, Puskesmas, private sector pediatricians and development of effective patient tracking mechanisms;
   e. Conduct a district wise pediatric TB patient pathway analysis which will inform linkage development efforts.

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\(^{40}\) Paediatricians and physicians have a misconception that pediatric FDCs do not have the optimum dose ratios and maybe less effective, so prescribe separate adult pills to cut and crush. The new FDC has the desired dose ratio and should overcome this inappropriate approach.
Diagnostics and treatment

2. The NTP should update the diagnostic algorithms for TB and MDR-TB in children at all levels of the pediatric TB cascade and include

   a. Use of Xpert for all respiratory samples (induced sputum and gastric aspirates) and encourage use of Xpert for lymph node samples and other extrapulmonary TB samples as much as possible for diagnosis;
   
   b. Use pediatric FDC and ethambutol for cases (ensure that the child TB champions are advocating this among their peers);
   
   c. Conduct an operational research project on Xpert in stool of children with suspected pulmonary TB.

Prevention

3. The NTP should ensure that adult TB physicians and health care workers are aware of contact management, DR-TB and perinatal TB algorithms to ensure referrals for diagnosis. This includes:

   a. Child contacts of TB patients can be evaluated at the “Child TB Puskesmas”. Counselling, IPT provision and 2 monthly follow-up can take place at a Puskesmas nearer to home;
   
   b. An evaluation of alternative preventive therapy methods, including 3 months of RH as an alternative to 6 months of Isoniazid to improve adherence, or 12 doses of Rifapentine and Isoniazid. This could be initiated as a structured OR project built into the Global Fund grant;
   
   c. Mandatory evaluation of all children of MDR TB patients for early disease detection and prevention;
   
   d. Post-exposure treatment for child contacts of DR-TB patients (which is not specified in WHO guidelines yet), should be structured as an OR project at PMDT sites (consider building into GF grant).

M&E

4. The NTP should ensure reporting of treatment outcomes in children, provision of IPT recording and reporting tools (inclusion in e-data base), simple reporting tools to incentivize private pediatricians to report, and should consider setting up child TB expert panels - establishing Whatsapp groups at provincial levels and from province to national levels.

17. Research

a. Findings

To achieve the targets set by the WHO End TB Strategy for 2030/2035, there is a need for high tuberculosis (TB) burden countries, including Indonesia, to intensify research to deliver new tools and strategies to combat the disease, in ways that fit the country’s specific situation.
Indonesia’s NTP recognizes the need for research to improve TB control, and has:

- appointed a research focal person, to act as an interface between the programme and research actors;
- established an annual call for proposal for thematic operational research projects;
- established a research, monitoring and evaluation group within its national TB expert advisory group (KOMLI).

Examination of Indonesia’s TB research landscape shows that:

- There is a national research institute for health research, NIHRD, with MoH funding;
- TB research priorities have been identified as part of NIHRD’s Neglected Disease Research Roadmap (2015/2016);
- Various universities and teaching hospitals are engaged in TB research, or have capacity to do research (Table 13);
- KNCV has 1 ongoing OR project and 13 piloting and evaluation projects;
- Collaborative research is ongoing with external funders and international universities. They include Indonesia’s research partnership on infectious diseases (INA-RESPOND: NIHRD –US-NIH/NIAID partnership for clinical research) and Indonesia’s Regional Prospective Observational Research in Tuberculosis consortium (Indonesia -RePORT);
- A mechanism exists for reviewing and funding proposals within NTP, Ministry of Research Technology and Higher Education, and Risbiniptekdok. (Riset pembinaan iptek kedokteran- Research Development of Science and Technology Medicine).

Investigation into programmatic research activities in the provinces visited (outside Jakarta) reveals that:

- There is minimal research embedded within the provincial and district programmatic structure (some districts showing stronger engagement than others); and,
- Research at district levels is usually sporadic and carried out by teaching hospitals and universities.

Table 13.

<table>
<thead>
<tr>
<th>TB Research Activity in Indonesia in 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source: WHO, Indonesia Country Office</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>RESEARCH CATEGORY</th>
<th>NO. PROJECTS (TOTAL)</th>
<th>NO. UNIVERSITIES HOSTING THESE PROJECTS</th>
<th>NO. OF PROJECTS IMPLEMENTED IN COLLABORATION WITH INTERNATIONAL UNIVERSITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic &amp; Translational</td>
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<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Epidemiology</td>
<td>7</td>
<td>3</td>
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</tr>
<tr>
<td>Operations</td>
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<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Clinical</td>
<td>10</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>
b. Challenges

- At the national level, the NTP is not regularly engaging with multidisciplinary research stakeholders to communicate research gaps or leverage resources to address them;
- There is no formal research dissemination strategy at the programme level (e.g. evaluation and piloting studies are not routinely published/disseminated);
- There is no clear strategy for reviewing/translation research with policy implication;
- NIHRD allocates a very small proportion of its annual budget (< 2%) for TB research; programmes (district and provincial levels) do not allocate funding for TB research;
- Programme staff at all levels (national to district) have limited research training;
- Link between programme staff and researchers/experts at district and provincial levels vary, with some provinces having stronger links than others.

Critical research gaps observed during this JEMM review are listed below, for consideration by the NTP and MoH. These are not the only research priorities for Indonesia, but these were the ones that were obvious to the team during field visits.

- Understanding the reasons for and outcomes of early defaulters and those lost to follow up among MDR-TB cases, and implementation research to assess the impact of potential interventions to prevent these;
- Mapping TB cases in the private sector, and optimizing a successful engagement model for improved case detection, reporting, and care;
- Comparative evaluation of TB screening strategies for impactful case finding (finding the missing cases);
- Comparative evaluation of community engagement approaches for active case finding;
- Measuring patient costs for both DS-TB and MDR-TB patients;
- Identifying critical barriers to accessing TB services among men, elderly, uninsured, near poor, and other key populations, and implementation research to assess the impact of potential interventions;
- Assessing patient knowledge, attitudes, preferences, and practices regarding primary private TB care.

A priority list of the country’s most important research questions should be a cornerstone of any TB research plan. Priorities would be based on a thorough understanding of the current TB epidemic, the research most needed to achieve the End TB targets, and an inventory of existing TB research capacity at country level. The national TB research network would establish these priorities in alignment with broader national health research strategies.

An implementation plan for the prioritized TB research plan with clear timeline, funding source (if known), responsible implementers as well as research dissemination strategy is needed to drive implementation and to generate evidence needed for decision making. A successful TB research programme requires sustained national funding for a range of research efforts, demonstrating a country’s commitment and helping attract investment from abroad, for example through participation in multicentre studies and trials. Initiatives like INA-RESPOND
and RePORT are good examples of collaborative initiatives in Indonesia, and further collaborative works that support large scale studies need to be strengthened and supported.

c. **Recommendations**

1. **The MoH/NTP should establish an Indonesian National TB Research Network, with NIHRD as a permanent secretariat, to strengthen coordination between existing initiatives in TB research through: (i) prioritization of research needs, (ii) collaboration in implementing these research priorities, and (iii) interpretation of research outcomes (NTP and NIHRD to jointly lead this).**

This network should be a platform for effective collaboration among research and health institutions, NTP (to ensure programmatic relevance), civil society, funders, other public health programmes, as well as sectors like the Ministries of Research and Technology, Education, etc. To actualize these goals, it is essential for:

a. NIHRD to map the contributions of universities/partners conducting TB research and include them in the network to leverage resources, minimize duplication of research, and increase collaboration;

b. NTP and NIHRD to jointly develop a clear terms of reference for this network and its mandate, in research prioritization and monitoring research implementation, capacity building, etc. (including a role for NTP to participate in reviewing research proposals and, if possible, to participate in those studies);

c. NTP to allocate budget for regular meeting, and seed funding for the activities as stated in the terms of reference;

d. The network to develop a single prioritized national TB research agenda (based on carefully conducted situational analysis and feedback from programme review) for investment and implementation.

2. **Include budgeted research priorities in the national action plan (NAP); a significant portion of national funding for TB research should go towards the research priorities identified in the national research agendas, with some flexibility to allow for novel, investigator-initiated ideas emerging from new research findings and directions.**

a. The MoH should increase investment in TB research through NIHRD (e.g. to 5-10% from the current <2%), so NIHRD can expand its TB research expertise and proactively conduct priority TB research activities that refer to the needs of the programme;

3. **The MoH should build capacity among programme staff at all levels (national, provincial and district) on how to use existing data, ask pertinent research questions, and address programmatic challenges. In collaboration with other sectors like the Ministry of Education, the MoH should ensure that:**

a. National needs for high-quality researchers are met and that graduate training (MSc, PhD) are made available for TB related topics in operational, clinical, epidemiological, social sciences, health system and bio-statistical research methods;

b. Research training is aligned with national research priorities and trainees and their national universities receive adequate support;
c. TB research as a strategy is incorporated in district and provincial TB action plans to mobilize sustainable internal funding for the conduct and use of research in TB control; and,

**Progress in implementing the national TB research plan with relevant indicators and milestones.** These include “process” indicators (how TB research is being strengthened) and “content” indicators (the extent of the TB strategy’s development and its impact on the End TB Strategy in the country).
Annexes

Annex 1 - Terms of Reference

Overall Objective

To make an independent, comprehensive and in-depth analysis of the TB situation, TB control efforts including review of policies and plans, progress and challenges and provide expert advice and guiding recommendations for further strengthening of TB control services to reach the National TB Plan 2015-2019, End TB Strategy, and Sustainable Development goals and targets.

Specific objectives

1. To review progress of the National TB Control Programme, within the framework of the National Strategic Plan for TB control (2015-2019) and towards reaching the TB-related Sustainable Development Goals;

2. To review TB situation in light of the current epidemiological analysis, prevalence survey results and assess whether current programme strategies and approaches are inline to reach the national goals and targets of End TB Strategy based on National Strategic Plan 2015-2019;

3. To assess the progress and constraints with specific focus on current case findings strategies, public private partnership, engagement of communities, civil societies organization, programmatic management of drug management TB, TB-HIV, childhood TB and collaboration with comorbidity programme and partners;

4. To review whether the current National TB Programme takes required advantage and supported by broader health agendas including universal health coverage, regulatory frameworks, social protection and poverty alleviation schemes;

5. To review progress on the implementation of recommendations made by the Joint External TB Monitoring Mission 2013.

Detailed programme review objectives and areas of assessment

- Review the epidemiology of TB in the country and the current capacity of national surveillance systems to directly measure the level of and trends in TB disease burden;

- Assess the structure, organization and management frameworks of the National TB Programme within the context of health-care system and national agenda for development;

- To assess the financial situation and human resources in light of the programme’s current requirement performance and future demands;

- Assess the progress of End TB Strategy introduction and implementation and reaching the TB-related Sustainable Development goals and targets, in particular:

  o Strategies, approaches, planning and implementation status of early diagnosis of tuberculosis including universal drug-susceptibility testing, and systematic screening of contacts and high-risk groups;
Introduction of new diagnostic tools and approaches;

Access and quality of treatment of all forms of tuberculosis in all age groups and gender and mechanisms for patient support;

Scaling up of drug-resistant tuberculosis including introduction of latest treatment regimens, new/repurposed drugs and patient support;

Policies and practices to ensure rational use of medicines and infection control;

Progress of collaborative tuberculosis/HIV activities, and management of co-morbidities;

Preventive treatment of persons at high risk, and vaccination against tuberculosis;

Engagement of communities, civil society organizations, INGO, CBO, FBO;

Partnership with public and private care providers for TB care control and elimination;

Political commitment and allocation of resources for tuberculosis care and prevention;

Universal health coverage policy, and regulatory frameworks for case notification, vital registration, quality rational use of medicines, and infection control;

Social protection, poverty alleviation and actions on other determinants of tuberculosis;

Operational research and innovation.

- Review country policy and strategy on cross cutting issues such as Human Resource and TB financing, including role of health insurance requirements and development;

- Identify actions to be pursued by NTP and its implementing partners with a focus on sustainability of the programme;

- Make recommends on priority areas and actions for the NTP for the next five years period (2017-2022).

**Expected Outcome**

1. Improve effectiveness of the National TB Programme;

2. Raise awareness about TB situation;

3. Strengthen political commitment for TB control at all levels;

4. Improve and strengthen strategic planning for TB control, and mobilize resources;

5. Promote coalitions for TB control with NGO, private sector, donors and HIV programme;

6. Identification of key challenges with recommendations how to address these;

7. Guidance for reaching the National TB Programme and Sustainable Development Goals and targets.
Annex 2 - Provinces and People Visited

West Sumatera

Mr Irwan Prayitno, Governor of West Sumatera
Mr Nasrul Abit, West Sumatera Vice governor
Dr Merry Yuliesday, West Sumatera Provincial Health Office
Dr Nany SR, Head of Disease Control and Prevention, West Sumatera PHO
Dr Riena Soviaty, Head of Communicable Diseases, West Sumatera PHO
Dr Yusriwan, Director of M Djamil Hospital
Dr Finny Fitri Yani, Pediatrician M Djamil Hospital
Dr Merry Yuliesday, Director of A Muchtar Hospital
Dr Aspinuddin, Head of Padang Pariaman District Health Office
Mr Jonpriadi, Secretary of Padang Pariaman Government
Dean of Nursing Faculty of Andalas University
Dean of Medical Faculty of Andalas University

DKI Jakarta

Dr Koesmedi Priihartono, Head of DKI Jakarta Province Health Office
Mrs Khafifah Any, Vice Head of DKI Jakarta Province Health Office
Dr Widyastuti, Head of Disease control department DKI Jakarta Province Health Office and staffs
Dr Murni Lusiana, TB Coordinator of DKI Jakarta PHO
Ms Ida Kurniawati, TB Coordinator of DKI Jakarta PHO
Head of Microbiology Dept, Faculty of Medicine, University of Indonesia and staffs (National Reference for Molecular testing)
Head and staff of RSPI Sulianti Saroso
Head and staff of St Carolus Hospital
Head and staff of RS Islam Cempaka Putih
Head and staff of RS Persahabatan
Head and staff of Jatinegara PHC
Head and staff of Kebayoran Baru PHC
Head and staff of Kebon Jeruk PHC
Head and staff of Cengkareng PHC
Head and staff of Kelapa Gading PHC
Head and staff of Jakarta Respiratory PPTI
Head and staff of Pengayoman Prison Hosp
Head and staff of Police Dept Hospital
Central Java
Dr Yulianto Prabowo, Head of Provincial Health Office
Secretary of Provincial Health Office
Central Java Provincial Planning Bureau
Head of Prevention and Disease Control Unit of PHO
Communicable Disease Control Section of PHO
Indonesian Medical Association Central Java Area
Provincial Board of Aisyiyah
Teratai Community TB Group, North Semarang
Director of Dr Kariadi General Hospital, Semarang
Vice Mayor of Surakarta
Surakarta Municipality Health Office
Director of Dr Moewardi General Hospital
Head of Surakarta Lung Hospital
Director of Muhammadiyah Hospital, Surakarta
Head of Jayengan Primary Health Center, Surakarta
Semarang Municipality Health Office
Head of Semarang Lung Clinic.
Director of Bakti Wira Tamtama Army Hospital, Semarang
Kedung Pane Prison, Semarang
Provincial Pharmacy Warehouse
Provincial Referral Laboratory.

South Kalimantan
Mr H. Muhamad Muslim, Acting of Head of PHO of South Kalimantan
Mrs Nina Sandra, Head of Disease Control Program, PHO south Kalimantan
Mr Bambang Sutiarjo, Head of CDC Section, PHO of South Kalimantan
Mr Muhammad Riza, TB Coordinator, PHO of South Kalimantan
Mr Noor Fajar Desira, Head of Bappeda and staffs, South Kalimantan Province
Mrs Yetty Fatimah, Head of Provincial Laboratory and staffs
Mrs Efrin Pujianti, Provincial Pharmacy Warehouse
Dr Dellis JF, Head of DHO of Banjarmasin City
Mrs Heny Dessi Rubiyana, TB supervisor of Banjarmasin City
Mr Nasrun Syah, Secretary of Banjar District
Mr Ilkhansyah, Head of DHO of Banjar District
Mr Syahdan, TB supervisor of Banjar District
Directors and staffs of Ulin General Hospital, Banjarmasin City
Directors and staffs of Dr H. Moch Ansari Hospital, Banjarmasin City
Directors and staffs of Islam Hospital, Banjarmasin City
Directors and staffs of Ratu Zalecha General Hospital, Banjar District
Head of Banjarmasin Prison
Aisyiyah
Nadhlatul Ulama
PKK

**South East Sulawesi**

Brigjen TNI H.M. Saleh Lasata, Vice Governor
Drg Heny Triviani, Deputy on Disease Control, South East Sulawesi PHO
Mrs Hanari, Head of Regional Health Laboratory
Dr Yusuf Hamra, Head of Health Centers
Mr Zainal Arifin, Provincial Planning Bureau
Mr Suleman Mile, Province Pharmacy Installation staff
Dr Khaerik, Bahteramas Provincial Hospital
Mrs Hasmirah Said, Aisyiyah
Mr Ruhaedins Djalaluddin, Head of Kolaka DHO
Mr Nursalam, District Pharmacy Installation, Kolaka
Head of Regional Health Laboratory, Kolaka
Kolaka Planning Bureau
Director of Benyamin Guluh Hospital, Kolaka
Head of Tanggetada Health Center
Drg Rahminingrum, Head of Kendari DHO
Head of Regional Health Laboratory, Kendari
Kendari Planning Bureau
Head of District Pharmacy Installation, Kendari
Head of Poasiea Health Center
Prison Class II Kendari
Director of Abunawas Hospital, Kendari
Director of Dr Ismoyo Hospital, Kendari
Director of Bahtramas Hospital, Kendari