All 11 Member States have sustained country-wide access to DOTS. Each year, more than 2 million TB cases are being registered for treatment and the treatment success rate among new smear-positive pulmonary TB cases has remained above 85% since 2005, and was 88% in 2010. The TB mortality rate has decreased by 40% since 1990 and the South-East Asia Region is on track to achieve the global target of a 50% reduction by 2015. The decline in the prevalence is observed in all Member countries and in some countries, it is over 50%. Approximately 40% of the estimated global number of cases occurs in the South-East Asia Region (based on current estimates) as well as more than one fourth on the MDR-TB burden. The collaboration between TB and HIV control programmes is improving. Many of the constraints to effective implementation of TB control services in Member States relate to underlying weaknesses and under-financing of national health systems in general, many of which are already overstretched in terms of both infrastructure and staffing. To enable universal access and continuing scale-up of critical interventions, there is an urgent need to sustain current financial commitments and to advocate for additional financial resources.
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Abbreviations

ACSM advocacy, communication and social mobilization
AIDS acquired immunodeficiency syndrome
ART antiretroviral treatment
ARTI annual risk for tuberculosis infection
BRAC Bangladesh Rural Advancement Committee
CDC United States Centers for Disease Control and Prevention
CFR case–fatality rate
CHC community health centre
COD cause of death
CPT cotrimoxazole preventive therapy
DFID United Kingdom Department for International Development
DHS Demographic Health Service
DOT directly observed treatment
DOTS directly observed treatment short course
DPR Korea Democratic People’s Republic of Korea
DRS Drug Resistance Survey/Surveillance
DR-TB drug-resistant tuberculosis
DST drug susceptibility testing
DTC district TB coordinators
EQA external quality assessment/assurance
ERD External Resource Division
EXPAND-TB Expanding Access to new Diagnostics for Tuberculosis
FDC fixed-dose combination
FHI Family Health International
FLD first-line anti-TB drugs
FIND Foundation for Innovative New Diagnostics
GDF Global (TB) Drug Facility
GENETUP German-Nepal Tuberculosis Project
GF Global Fund to Fight AIDS, Tuberculosis and Malaria
GLC Green Light Committee
GLI Global Laboratory Initiative
HBC high-burden countries
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHC</td>
<td>primary health care</td>
</tr>
<tr>
<td>PHI</td>
<td>public health inspectors</td>
</tr>
<tr>
<td>PHL</td>
<td>public health laboratory</td>
</tr>
<tr>
<td>PITC</td>
<td>provider-initiated HIV testing and counselling</td>
</tr>
<tr>
<td>PLHIV</td>
<td>people living with HIV</td>
</tr>
<tr>
<td>PMDT</td>
<td>programmatic management of drug-resistant tuberculosis</td>
</tr>
<tr>
<td>PPM</td>
<td>public-private, public-public or private-private mix</td>
</tr>
<tr>
<td>PSI</td>
<td>Population Services International</td>
</tr>
<tr>
<td>PSM</td>
<td>procurement supply management</td>
</tr>
<tr>
<td>PTB</td>
<td>pulmonary TB</td>
</tr>
<tr>
<td>QA</td>
<td>quality assurance</td>
</tr>
<tr>
<td>RNTCP</td>
<td>Revised National Tuberculosis Control Programme (India)</td>
</tr>
<tr>
<td>RO</td>
<td>Regional Office (of WHO)</td>
</tr>
<tr>
<td>R&amp;R</td>
<td>recording and reporting</td>
</tr>
<tr>
<td>SAARC</td>
<td>South Asian Association for Regional Cooperation</td>
</tr>
<tr>
<td>SEAR</td>
<td>(WHO) South-East Asia Region</td>
</tr>
<tr>
<td>SLD</td>
<td>second-line drugs (for MDR-TB)</td>
</tr>
<tr>
<td>SNRL</td>
<td>Supranational Reference Laboratory</td>
</tr>
<tr>
<td>SOP</td>
<td>standard operating procedures</td>
</tr>
<tr>
<td>STD</td>
<td>sexually transmitted disease</td>
</tr>
<tr>
<td>STI</td>
<td>sexually transmitted infection</td>
</tr>
<tr>
<td>STAG</td>
<td>Strategic and Technical Advisory Group (for Tuberculosis)</td>
</tr>
<tr>
<td>TB</td>
<td>tuberculosis</td>
</tr>
<tr>
<td>TB–HIV</td>
<td>tuberculosis and human immunodeficiency virus</td>
</tr>
<tr>
<td>TBTEAM</td>
<td>TB Technical Assistance Mechanism</td>
</tr>
<tr>
<td>ToT</td>
<td>training of trainers</td>
</tr>
<tr>
<td>TRC</td>
<td>Tuberculosis Research Centre (Chennai, India)</td>
</tr>
<tr>
<td>The Union</td>
<td>International Union Against Tuberculosis and Lung Disease</td>
</tr>
<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
</tr>
<tr>
<td>USP</td>
<td>U.S. Pharmacopeial Convention</td>
</tr>
<tr>
<td>VCTC</td>
<td>voluntary counselling and testing centre</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
<tr>
<td>XDR-TB</td>
<td>extensively drug-resistant tuberculosis</td>
</tr>
</tbody>
</table>
Preface

Substantial progress continues to be made by the Member States of the WHO South-East Region (SEAR) in combating tuberculosis (TB). However, the Region still bears 40% of the “global burden” of TB in terms of incidence. It has a pool of nearly 5 million cases to which more than 3 million are added each year. The decline in prevalence is observed in all Member States: since 1990, it is over 50% in some countries.

The mortality rate among TB patients has decreased by 40% during the same period. However, the absolute number of TB deaths is still close to half a million. This is mainly because of the “population momentum”. With good performance in the implementation of directly observed treatment short course (DOTS), the level of “multi-drug-resistant” (MDR) TB among newly detected cases is low. Nonetheless, due to the large number of the total TB cases, the Region accounts for an estimated 90 000 MDR-TB cases. This is nearly one third of the global estimate of MDR-TB cases.

HIV–TB confection is a serious problem in the SEA Region. National TB control and National AIDS control programmes in most countries in the Region are jointly implementing a comprehensive package of interventions against this problem. This is helping them cover an estimated almost 1500 million people.

However, we need to recognize that these achievements can be successfully maintained in the long term only when national health systems based on the primary health care (PHC) approach function effectively. The primary health care approach is the key intervention to help ensure that the hard-to-reach, or the unreached populations are covered. Tuberculosis is a disease of poverty, having strong social and economic determinants. Therefore, adequate social and economic support is critically important for the success of TB control programmes.

An estimated one third of TB cases remains unreported. Such cases are of particular concern, because they perpetuate continued disease transmission in the community and pose a serious risk of drug-resistant TB that leads to difficulty in its treatment, and to high TB mortality.
The long-term goal of TB control is to eliminate the disease as “a public health problem”. With this perspective in view, increased and continued commitment is needed from all stakeholders and partners. In the process of implementing the control programmes with external inputs, special attention should be paid to “country capacity strengthening” in order to achieve “long-term, sustainable self-reliance”. In this context, we need to recognize that “improvement” in the “overall social and economic development” of a country will contribute importantly in its “long-term, sustained success” in TB “elimination” or “eradication”. A comprehensive and holistic package of interventions for TB control must involve “multispectral” and “multidisciplinary” efforts.

This annual report is a compilation of regional and country-specific achievements, challenges and plans. WHO will continue to provide technical support to catalyze and accelerate the implementation of TB care and control in Member States through a range of activities as detailed in this report. I am sure that with the commitment of ministries of health and support from all partners and stakeholders, the Region will achieve the desired targets and lead the global fight against TB.

Dr Samlee Plianbangchang  
Regional Director
Tuberculosis remains one of the major public health concerns in the South-East Asia Region of WHO. The Region accounts for 40% of the global burden of TB in terms of TB incidence. India and China together account for almost 40% of the world’s TB cases. It is estimated that about 3.5 million new cases of TB continue to occur each year and about 480 000 people die of this disease annually, most of these in five countries, namely, Bangladesh, India, Indonesia, Myanmar and Thailand. In 2011, TB patients with known HIV status were 32% and, among them, 7.2% were found HIV–positive. On the other hand, 59% of HIV–positive TB cases were on antiretroviral therapy. Fortunately, levels of multidrug-resistance are still low at less than 3%; however, this translates into nearly 90 000 estimated MDR-TB cases among all TB cases notified in 2011.
In terms of progress in TB control, all 11 Member States have sustained country-wide access to DOTS. Each year, more than 2 million TB cases are being registered for treatment and the treatment success rate among new smear-positive pulmonary TB cases has remained above 85% since 2005, and was 88% in 2010 cohort. The TB mortality rate has decreased by 40% since 1990 and the South-East Asia Region is on track to achieve the global target of a 50% reduction by 2015. The decline in prevalence is observed in all Member countries, and in some countries it is over 50%.

National TB control programmes have also made progress with implementing the components of the Stop TB strategy. As a result of this concerted action by national TB control programmes and all partners, almost 20 million TB patients have been treated during the past 10 years; thereby averting several thousand deaths. WHO/SEAR has established r-GLC (Regional Green Light Committee) Secretariat in May 2012 with nine members as “Regional MDR-TB Advisory Committee”. The overall purpose of the Secretariat is to provide technical assistance to Member countries in scaling up of programmatic management of drug-resistant TB, so that the countries could gradually expand drug-resistant TB services to enrol an increasing number of patients with drug-resistant TB for treatment. TB–HIV activities are available country-wide in India and Thailand, and are being expanded in Myanmar. Indonesia is at the stage of concentrated epidemic, with a generalized epidemic in Papua province where the HIV prevalence in the general population is at 2.4%; 12 provinces have been identified as priority areas for HIV interventions. As a result, a comprehensive package of interventions for HIV-associated TB is now available to almost 1500 million of the Region’s population. Private–public collaborative activities have been further expanded in medical colleges, private and large public hospitals, corporate sectors, prisons and nongovernmental organizations. Infection control policies and plans are being pursued in 10 countries. Newer diagnostics are being deployed with assistance from partners in all high TB burden countries and, additionally in Nepal. At the same time, national programmes have continued to engage with communities, and several community-based TB care projects are in place in all 11 Member countries. In addition, recognizing that the success of TB control depends on strong health systems, to strengthen health systems components were included in the national strategic plans.
In terms of resources, national governments meet half of the budgets available to run national TB control programmes, while the Global Fund covers more than a third of funding. Additional support is received through several bilateral agreements with donor governments and agencies including USAID TBCARE I and II in Indonesia and Bangladesh respectively, through the three MDGs and USAID Funds in Myanmar and USAID in India. Other global initiatives such as UNITAID, the Global Drug Facility, the Global Laboratory Initiative, the EXPAND TB PROJECT, TB REACH and the Stop TB partnership are helping to mobilize resources for the diagnosis and treatment of all forms of TB towards achieving universal case detection and treatment. To date, the available budget for 2013 is almost 70% of the estimated needed budget for the whole Region.

While considerable progress continues to be made, national TB control programmes still face a number of challenges that relate to uncertainties regarding sustainable financial and operational resources, limited technical and management capacity, weak procurement and supply management mechanisms, and national laboratory networks. These uncertainties, in turn, are slowing the planned expansion of early and enhanced case detection and interventions for TB–HIV and DR-TB. Though collaboration with other sectors is steadily increasing, the provision of care by all health care providers is not sufficiently linked to national programmes to make an impact at the national level. Low community awareness and utilization of services hamper the uptake of services. It is increasingly becoming recognized that attention needs to be paid to addressing the social, economic and behavioural determinants that impact TB, if national efforts to combat TB are to succeed in the longer term.
Epidemiology of Tuberculosis in the South-East Asia Region

The WHO South-East Asia (SEA) Region with an estimated 5 million prevalent and about 3.5 million incident cases in 2011 carries about 40% of the global burden of tuberculosis (Figure 1). Five of the 11 Member countries in the Region are among the 22 high-burden countries, with India alone accounting for 25% of the world’s incident cases. Most cases continue to occur among young adults, particularly in the most productive age group of 25–34 years. Males are disproportionately affected: the male-to-female ratio was 2.0 among all new smear-positive TB cases detected for the year 2011 in the Region and it was 2.9 among cases older than 45 years. Though the death rates due to TB continue to steadily decline after the introduction of DOTS
in the Region, the disease is estimated to claim still little less than half a million lives each year.

Figure 1: Estimated incidence of all forms of TB, classified by WHO Region, 2011

<table>
<thead>
<tr>
<th>Region</th>
<th>Estimated Incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Mediterranean Region</td>
<td>8%</td>
</tr>
<tr>
<td>African Region</td>
<td>26%</td>
</tr>
<tr>
<td>Western Pacific Region</td>
<td>19%</td>
</tr>
<tr>
<td>South-East Asia Region</td>
<td>40%</td>
</tr>
<tr>
<td>European Region</td>
<td>4%</td>
</tr>
<tr>
<td>Region of the Americas</td>
<td>3%</td>
</tr>
</tbody>
</table>

Estimated global TB incidence = 8 700 000 (8 300 000 – 9 000 000) cases (all forms of TB)

2.1 Estimated TB incidence, prevalence and mortality in the South-East Asia Region

2.1.1 Enhancement of TB burden estimates methodology

In 2009, the methodology for the calculation of TB burden estimates (prevalence, incidence and mortality) was revised and enhanced by WHO.\(^1\) As a consequence, figures published from 2010 onward cannot be compared with older estimates.

It is important to highlight that all TB burden estimates are imprecise and they are published as best estimates with confidence intervals; the uncertainty intervals provide a range of plausible values and their width is inversely proportional to the accuracy of the estimate, depending on quality and coverage of country data.

\(^1\) Full details about the methods used are provided in Annex 1 of the “Global Tuberculosis Control: WHO report 2012”
Some of the estimates are not officially endorsed by Member States. All countries are strongly encouraged to improve their TB burden estimates through available methods: in-depth analysis of data available in countries, systematic assessment of the quality and coverage of surveillance data, inventory studies, strengthening TB surveillance within countries, operational research, strengthening vital registration (VR) systems, prevalence and mortality surveys.

For all the countries in the South-East Asia Region, TB incidence was estimated through indirect method (based on estimated case-detection rate combined with notification data). During a regional workshop on TB burden estimates held in 2009, case-detection rate of all forms of TB was estimated through in-depth analysis of available surveillance data, information on access to health and programmatic management of TB; expert opinion on proportion of cases not detected or not captured by TB surveillance was also considered. Trends over time were calculated considering changes of case-detection rate in different years, except for Bhutan and India where results from repeat annual risk for tuberculosis infection (ARTI) surveys were used as well. When information was not enough for time series analysis, the incidence was considered flat, “frozen” at the value of the most recent point estimate.

For India, in addition to the regional workshop, two national consultations were held in July 2011 and July 2012 to revise burden estimates. In addition to data used for other countries, case-detection rate was estimated with the support of two sub-national inventory studies. However, national inventory studies are needed, in particular to better assess the number of TB cases detected in the private sector, but not reported. In the analysis of trend over time, the trend was estimated to be flat between 1990 and 2001, due to absence of data and considering that RNTCP started in 1999 only in part of the country. Between 2001 and 2011, based on data from two national tuberculin surveys (conducted in 2000 and 2010) and annual notification data, the rate of decline in TB incidence was assessed to be 1.5% per year.

Prevalence was estimated in the Region, on the basis of the results of prevalence surveys (direct method) only for Bangladesh and Myanmar that conducted the study in 2010 and 2009, respectively; however, Bangladesh did not use the methodology recommended by WHO and is planning to conduct another prevalence survey by 2015. For all other countries, prevalence was
estimated with the indirect method, multiplying incidence by estimated duration of TB disease. This type of estimate is the most uncertain of the three TB burden indicators, because it is the product of two uncertain quantities, incidence and disease duration, that cannot be measured directly.

Excluding India, TB-related mortality was estimated indirectly, multiplying incidence by estimated case fatality ratio, since no country has good quality vital registration system or data from mortality surveys. In India, data from six sub-national mortality surveys were pooled to obtain a national estimate for 2005 and derive a complete time-series for 1990–2010; the current estimate is higher than the previous indirect estimate.

In the Region, progress towards enhancement of burden estimates is being made. Sri Lanka conducted an in-depth analysis of data in 2010. Thailand piloted a national electronic database to be rolled out in all Regions of the country to improve real-time reporting; in 2012, it reported mortality data from the vital registration system, although of inadequate quality. India successfully transitioned its electronic recording and reporting system (EPI Centre software) to a Windows-based platform and developed a case-based web-based notification system (Nikshay). Making TB a mandatorily notifiable disease is a major policy change in India that will impact the completeness of TB case notification.

Population-based surveys of the prevalence of TB disease can provide direct measurement of prevalence as well as useful information about why and to what extent people with TB are missed in surveillance data. Thailand concluded the field operations for a national prevalence survey and updated burden estimates are expected in 2013. Indonesia concluded the preparatory phase to conduct a second national prevalence survey (the first was conducted in 2004) and will start field operations in 2013. Bangladesh, Myanmar and Nepal are planning to conduct national prevalence surveys by 2015 (for Myanmar, the survey will serve as a direct measurement of point prevalence and trend over time).

2.1.2 Estimated TB incidence, prevalence and mortality

The control of tuberculosis in the Region is affected by variations in the quality and coverage of various TB control interventions, population demographics, urbanization, changes in socioeconomic standards, magnitude of the sub-
epidemics of TB–HIV and MDR-TB. The TB incidence, prevalence and mortality rates in Member States of the SEA Region, estimated as discussed in paragraph 2.1.1, are presented in Table 1.

<table>
<thead>
<tr>
<th>Country</th>
<th>Population(^a) (in thousands)</th>
<th>Incidence rate of all forms of TB (confidence intervals)</th>
<th>Prevalence rate of all forms of TB (confidence intervals)</th>
<th>Death rate for all forms of TB, excluding HIV (confidence intervals)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>151 574</td>
<td>225 (185-268)</td>
<td>411 (199-698)</td>
<td>45 (19-82)</td>
</tr>
<tr>
<td>Bhutan(^b)</td>
<td>744</td>
<td>192 (165-222)</td>
<td>230 (81-454)</td>
<td>17 (6.3-34)</td>
</tr>
<tr>
<td>DPR Korea</td>
<td>24 730</td>
<td>345 (296-397)</td>
<td>422 (126-892)</td>
<td>6.4 (5.9-6.9)</td>
</tr>
<tr>
<td>India(^c)</td>
<td>1 250 232</td>
<td>181 (163-199)</td>
<td>249 (168-346)</td>
<td>24 (15-35)</td>
</tr>
<tr>
<td>Indonesia</td>
<td>244 191</td>
<td>187 (155-222)</td>
<td>281 (130-489)</td>
<td>27 (12-48)</td>
</tr>
<tr>
<td>Maldives</td>
<td>322</td>
<td>34 (29-39)</td>
<td>44 (18-83)</td>
<td>2.5 (2.1-2.9)</td>
</tr>
<tr>
<td>Myanmar</td>
<td>48 721</td>
<td>381 (326-439)</td>
<td>506 (390-637)</td>
<td>48 (22-84)</td>
</tr>
<tr>
<td>Nepal</td>
<td>30 637</td>
<td>163 (135-194)</td>
<td>243 (110-428)</td>
<td>23 (10-41)</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>21 367</td>
<td>66 (55-79)</td>
<td>101 (46-176)</td>
<td>5.4 (3.0-8.3)</td>
</tr>
<tr>
<td>Thailand</td>
<td>70 739</td>
<td>124 (102-147)</td>
<td>161 (73-282)</td>
<td>14 (6.1-25)</td>
</tr>
<tr>
<td>Timor-Leste(^d)</td>
<td>1 157</td>
<td>–</td>
<td>–</td>
<td>63 (26-115)</td>
</tr>
<tr>
<td>SEAR</td>
<td>1 844 415</td>
<td>189 (176-203)</td>
<td>271 (206-344)</td>
<td>26 (19-34)</td>
</tr>
</tbody>
</table>


\(^b\)The rates reported in this table slightly differ from rates reported in the Bhutan country profile because different population figures have been used.

\(^c\)The estimated incidence, prevalence and mortality rates should be considered provisional, as they have not yet been officially approved by the Ministry of Health and Family Welfare - Government of India.

\(^d\)Timor-Leste incidence and prevalence estimates are to be revised upon availability of better quality data; therefore, in this report, no estimate is reported for the country. Refer to the country profile for further details.
Figure 2 compares the estimated TB prevalence rates per 100,000 population between 1990 and 2011 in each of the 11 Member States of the Region. However, this comparison takes into consideration only the best estimate of prevalence rate, and not the uncertainty bounds. Taking into account this limitation, a decline in the prevalence rates is observed in all Member States, and in some countries, it is very significant, beyond 50%, which is one of the Stop TB Partnership targets for 2015.

Figure 2: Estimated prevalence rate (all forms of TB, except coinfection with HIV) in 1990 and 2011, by Member State of the South-East Asia Region

Note: Timor-Leste prevalence estimates calculated with methodology revised by WHO in 2010; is to be revised upon availability of better quality data. Therefore, Timor-Leste data are not reported in this graph. Refer to the country profile for further details.


Figure 3 compares the estimated TB mortality rates per 100,000 population in 1990 and 2011 in each of the 11 Member States of the Region. As said earlier, this comparison takes into consideration only the best estimate of mortality rate, and not the uncertainty bounds. A significant decline in the mortality rates is observed in all Member States. For Timor-Leste, the baseline is set at 2005, due to non-availability of national data in 1990. For some countries, the mortality decrease is already beyond 50% of the 1990 baseline that is the Stop TB Partnership target for 2015.
The trends of estimated prevalence, incidence and mortality rates in the SEA Region as a whole are presented in Figure 4. TB prevalence and mortality rates decreased by about 40%. The decline in incidence, however, is less perceptible but the tendency began to revert.
However, the interpretation of the trends should take into account the uncertainty bounds around each value. Figures 5, 6 and 7 shows the trends of, respectively, incidence, prevalence and mortality as best estimate and upper and lower confidence intervals.

Figures 5: Trend of TB incidence rate (best estimate, upper and lower bounds) from 1990 to 2011 in the South-East Asia Region.

Figures 6: Trend of TB prevalence rate (best estimate, upper and lower bounds) from 1990 to 2011 in the South-East Asia Region.
2.2 Community-based surveys to estimate prevalence of pulmonary tuberculosis, annual risk of tuberculosis infection (ARTI) and mortality due to TB

A number of community-based surveys have been carried out in the Region at different times to estimate the prevalence of pulmonary TB (PTB). Most of the surveys were conducted at the sub-national level and the screening methodology varies across the surveys, reducing the comparability of outcomes. The currently recommended methodology (symptoms screening and chest X-ray) was applied only in Myanmar (2006 and 2010). The results of surveys undertaken since 1990 are summarized in Table 2 and show large in-country and between-country variability.

Four rounds of prevalence surveys in Tiruvallur district in Tamil Nadu, India, between 1999 and 2006 showed a decline of about 12% per year in the prevalence of smear-positive as well as culture-positive PTB; however, the latest survey showed a slight increase compared to 2006 (about 7%). In this area, no decline in prevalence had been observed in the pre-DOTS period through several rounds of surveys carried out between 1968 and 1986. The most recent survey results in India (six district/sub-district level surveys) show...
variable levels of TB prevalence in different geographical areas and provide important information for the revision of national burden estimates.

In Indonesia, the national-level prevalence survey conducted during the year 2004 demonstrated a three-fold decline in prevalence rates when compared to the prevalence rates obtained during a number of district-level surveys carried out during the 1980s. As said earlier, Indonesia is planning to conduct another TB prevalence survey by 2013 using the methodology currently recommended by WHO.

The subnational surveys carried out in Bangladesh in the early 2000s are not comparable with the nationwide prevalence survey conducted in 2009, since a different methodology was used. As said earlier, Bangladesh plans to conduct another TB prevalence survey by 2015 using the methodology currently recommended by WHO.

Myanmar conducted a TB prevalence survey in Yangon district in 2006 and completed a nationwide TB prevalence survey in 2010; results showed higher prevalence compared to previous estimates.

Results of a recently concluded nationwide survey in Thailand, using symptoms screening and chest X-ray are not yet available.

Table 2: Prevalence surveys in Member States of the South-East Asia Region, 1990-2011

<table>
<thead>
<tr>
<th>Country</th>
<th>Area</th>
<th>Study period</th>
<th>Age (yrs ≥)</th>
<th>Sample size</th>
<th>Screening method</th>
<th>Prevalence of PTB cases/ 100 000 population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>74 sub-districts</td>
<td>2001</td>
<td>12</td>
<td>223 936</td>
<td>Symptoms</td>
<td>Culture +ve: 24, Smear +ve: 24</td>
</tr>
<tr>
<td></td>
<td>Matlab rural area</td>
<td>2001</td>
<td>15</td>
<td>59 395</td>
<td>Symptoms</td>
<td>Culture +ve: 95, Smear +ve: 95</td>
</tr>
<tr>
<td></td>
<td>National level</td>
<td>2007–09</td>
<td>15</td>
<td>52 098</td>
<td>No screening*</td>
<td>Culture +ve: 79</td>
</tr>
<tr>
<td>Country Area</td>
<td>Study period</td>
<td>Age (yrs ≥)</td>
<td>Sample size</td>
<td>Screening method</td>
<td>Culture +ve</td>
<td>Smear +ve</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>--------------</td>
<td>-------------</td>
<td>-------------</td>
<td>------------------</td>
<td>-------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Morena (Madhya Pradesh)</td>
<td>1991–92</td>
<td>15</td>
<td>11 097</td>
<td>Symptoms</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Delhi</td>
<td>1991</td>
<td>5</td>
<td>27 838</td>
<td>MMR</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Car Nicobar (Andaman &amp; Nicobar)</td>
<td>2000–01</td>
<td>15</td>
<td>10 570</td>
<td>Symptoms</td>
<td>–</td>
<td>729</td>
</tr>
<tr>
<td>Tiruvallur (Tamil Nadu)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1999–01</td>
<td>15</td>
<td>83 425</td>
<td>MMR + symptoms</td>
<td>609</td>
<td>326</td>
</tr>
<tr>
<td></td>
<td>2001–03</td>
<td>15</td>
<td>85 474</td>
<td>MMR + symptoms</td>
<td>451</td>
<td>257</td>
</tr>
<tr>
<td></td>
<td>2004–06</td>
<td>15</td>
<td>89 413</td>
<td>MMR + symptoms</td>
<td>311</td>
<td>169</td>
</tr>
<tr>
<td></td>
<td>2007–08</td>
<td>15</td>
<td>92 255</td>
<td>MMR + symptoms</td>
<td>391</td>
<td>182</td>
</tr>
<tr>
<td>Tribal areas (Madhya Pradesh)</td>
<td>2006–07</td>
<td>15</td>
<td>20 000</td>
<td>Symptoms</td>
<td>–</td>
<td>387</td>
</tr>
<tr>
<td>Faridabad (Haryana)</td>
<td>2008–09</td>
<td>15</td>
<td>98 599</td>
<td>Symptoms</td>
<td>129</td>
<td>105</td>
</tr>
<tr>
<td>Rural Bangalore – all panchayats</td>
<td>2007–09</td>
<td>15</td>
<td>71 874</td>
<td>MMR + symptoms</td>
<td>195.6</td>
<td>101.6</td>
</tr>
<tr>
<td>Rural Bangalore – 6 panchayats</td>
<td>2007–09</td>
<td>15</td>
<td>31 823</td>
<td>MMR + symptoms</td>
<td>298.3</td>
<td>177.4</td>
</tr>
<tr>
<td>Wardha</td>
<td>2007–09</td>
<td>15</td>
<td>55 096</td>
<td>MMR + symptoms</td>
<td>139.7</td>
<td>132</td>
</tr>
<tr>
<td>Jabalpur</td>
<td>2007–09</td>
<td>15</td>
<td>99 918</td>
<td>Symptoms</td>
<td>–</td>
<td>171.9</td>
</tr>
<tr>
<td>Banda</td>
<td>2007–09</td>
<td>15</td>
<td>46 709</td>
<td>Symptoms</td>
<td>–</td>
<td>245.4</td>
</tr>
<tr>
<td>Kanpur</td>
<td>2007–09</td>
<td>15</td>
<td>49 766</td>
<td>Symptoms</td>
<td>–</td>
<td>322.7</td>
</tr>
<tr>
<td>Mohali</td>
<td>2007–09</td>
<td>15</td>
<td>91 030</td>
<td>Symptoms</td>
<td>–</td>
<td>6.2</td>
</tr>
<tr>
<td>Country</td>
<td>Area</td>
<td>Study period</td>
<td>Age (yrs ≥)</td>
<td>Sample size</td>
<td>Screening method</td>
<td>Prevalence of PTB cases/ 100 000 population</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------------</td>
<td>--------------</td>
<td>-------------</td>
<td>-------------</td>
<td>------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>Indonesia</td>
<td>National level</td>
<td>2004</td>
<td>15</td>
<td>50 134</td>
<td>Symptoms</td>
<td>104 – –</td>
</tr>
<tr>
<td>Myanmar</td>
<td>Yangon division</td>
<td>2006</td>
<td>15</td>
<td>20 792</td>
<td>Symptoms and chest X-ray</td>
<td>279 – 537</td>
</tr>
<tr>
<td>Myanmar</td>
<td>National level</td>
<td>2010</td>
<td>15</td>
<td>51 367</td>
<td>Symptoms and chest X-ray</td>
<td>– 239 605</td>
</tr>
</tbody>
</table>

* Sputum samples collected from all participants

Tuberculin surveys to estimate the annual risk of tuberculosis infection (ARTI) among children continue to be conducted in the Region; the most recent were conducted in Bhutan, India and Sri Lanka; the latter recently conducted a national-level ARTI whose results are not published yet. It is currently recommended not to use ARTI estimates to estimate disease incidence and derive prevalence, since the assumptions needed to link ARTI and incidence were shown to be not valid anymore. However, the results from ARTI surveys, along with other information have been used to revise burden estimates, particularly in Bhutan, DPR Korea and India.

Tuberculin surveys carried out in the Member States of the Region from 1990 onwards are presented in Table 3. The results indicate variable rates of ARTI between and within countries.

The trends in ARTI are available from two areas of India. In Tiruvallur, a district in southern India, the trends in ARTI mirrored the decline in prevalence of TB over the same time period. A decline in ARTI rates was also seen in Bangalore city and in zonal surveys.

In Indonesia, surveys in five provinces demonstrated a significant decline in ARTI when compared to the ARTI estimates obtained during several district-level surveys carried out in the 1980s.
<table>
<thead>
<tr>
<th>Country</th>
<th>Area</th>
<th>Year</th>
<th>Sample size</th>
<th>Age group (Years)</th>
<th>Estimated ARTI (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>National level</td>
<td>2007-09</td>
<td>17 585</td>
<td>5-14</td>
<td>Overall 4.0 (2.8 among 5-9 year old) (5.4 among 10-14 years old)</td>
</tr>
<tr>
<td>Bhutan</td>
<td>Thimphu, Mongar &amp; Bumthang districts</td>
<td>1991</td>
<td>1736</td>
<td>6-14</td>
<td>1.9</td>
</tr>
<tr>
<td></td>
<td>National level</td>
<td>2009</td>
<td>6 303</td>
<td>6-8</td>
<td>0.4-0.5</td>
</tr>
<tr>
<td>DPR Korea</td>
<td>National level</td>
<td>2007</td>
<td>11 182</td>
<td>7-8</td>
<td>3.0</td>
</tr>
<tr>
<td>India</td>
<td>Bangalore city</td>
<td>1998</td>
<td>4 936</td>
<td>5-8</td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2006</td>
<td>3 354</td>
<td>5-8</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>Rural areas, Tiruvallur district, Tamil Nadu</td>
<td>1999–01</td>
<td>12 854</td>
<td>0-9</td>
<td>1.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2004–05</td>
<td>8 668</td>
<td>0-9</td>
<td>1.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2001–03</td>
<td>8 329</td>
<td>0-9</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>Orissa (state level)</td>
<td>2002</td>
<td>10 626</td>
<td>1-9</td>
<td>1.7</td>
</tr>
<tr>
<td></td>
<td>Andhra Pradesh (state level)</td>
<td>2005–06</td>
<td>3 636</td>
<td>5-9</td>
<td>1.4</td>
</tr>
<tr>
<td></td>
<td>Khammam, Andhra Pradesh</td>
<td>2001–02</td>
<td>5-7</td>
<td></td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>Zonal level surveys (4 zones)</td>
<td>2000–03</td>
<td>N. Zone-51 380 W. zone-51 733 E. Zone-42 836 S. Zone-52 300</td>
<td>0-9</td>
<td>N. Zone-1.9 W. Zone-1.6 E. Zone-1.3 S. Zone-1.0</td>
</tr>
<tr>
<td></td>
<td>Kerala—(state level)</td>
<td>2006</td>
<td>4 821</td>
<td>5-9</td>
<td>Not available**</td>
</tr>
<tr>
<td></td>
<td>Chennai city</td>
<td>2006</td>
<td>7 008</td>
<td>1-9</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>Tribal areas, Madhya Pradesh</td>
<td>2006</td>
<td>4 802</td>
<td>1-9</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>Zonal level surveys</td>
<td>2007–09</td>
<td>N. Zone-15 175 W. Zone-16 800 E. Zone-20 969 S. Zone-25 704</td>
<td>0-9</td>
<td>N. Zone-0.9 W. Zone-0.7 E. Zone-1.1 S. Zone-1.2</td>
</tr>
</tbody>
</table>
## Country Area Year Sample size Age group (Years) Estimated ARTI (%)

<table>
<thead>
<tr>
<th>Country</th>
<th>Area</th>
<th>Year</th>
<th>Sample size</th>
<th>Age group</th>
<th>Estimated ARTI (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia-Provincial Level surveys</td>
<td>West Sumatra</td>
<td>2006</td>
<td>5653</td>
<td>6-9</td>
<td>1-1.3&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Nusa Tenggara</td>
<td>2007</td>
<td>5479</td>
<td>1-1.3&lt;sup&gt;2&lt;/sup&gt;</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Central Java</td>
<td>2007</td>
<td>6943</td>
<td>0.9</td>
<td>0.9</td>
</tr>
<tr>
<td></td>
<td>North Sulawesi</td>
<td>2008</td>
<td>6557</td>
<td>1.9-2.5&lt;sup&gt;2&lt;/sup&gt;</td>
<td>1.9-2.5&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>South Kalimantan</td>
<td>2008</td>
<td>6359</td>
<td>1.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Nepal</td>
<td>Sub-national surveys in 17 selected areas</td>
<td>1985–95</td>
<td>Not Available</td>
<td>6-10</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>National level</td>
<td>2006–07</td>
<td>17260</td>
<td>5-7</td>
<td>0.9</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>National level</td>
<td>2009</td>
<td>5280</td>
<td>10</td>
<td>0.4-1.2</td>
</tr>
</tbody>
</table>

<sup>2</sup>Estimates vary depending upon statistical method of estimation; ** ARTI could not be estimated due to low proportion of tuberculin reactors leading to absence of demarcation on the frequency distribution of tuberculin reaction sizes.

A limited number of TB mortality studies based on vital registration, and verification of the cause of death (COD) through verbal autopsies, have been carried out in the Region. A study in Chennai revealed TB mortality rate at 152 per 100 000 population among males and 43 per 100 000 among females. A state-level study in Andhra Pradesh revealed that 5% of deaths among males and 3% among females were caused by TB. In Indonesia, verbal autopsy-based mortality studies carried out at seven sites at the provincial and sub-provincial levels, during 2006–2008, revealed that TB was ranked first to third among the leading causes of death in the different provinces.

A national-level study to find out the cause of death (COD) in a sample of one million deaths was conducted in India; results are not yet available.

Myanmar is planning to conduct a nationwide TB mortality survey in 2015.

### 2.3 Impact of HIV on TB in the Region

It is estimated that there are 3.46 million people living with HIV (PLHIV) in the South-East Asia Region, constituting nearly 10% of PLHIV globally. In 2011, there were an estimated 211 000 new HIV infections in the Region and 230 000
AIDS-related deaths. Five countries in the Region (India, Indonesia, Myanmar, Nepal and Thailand) account for 99% of HIV cases in the Region.

The estimated number of PLHIV range widely, from <100 in the Maldives to 2.4 million in India. The magnitude of HIV infection differs greatly between countries of the Region, and even within countries, there are marked differences. The majority of countries in the Region have low level or concentrated epidemics (Figure 8).

Figure 8: HIV prevalence in Member States of the South-East Asia Region, 2010

Source: HIV/AIDS in the South East Asia Region: Progress Report 2011

The prevalence of HIV in the general population is estimated to be the highest in Thailand, followed by Myanmar, Nepal and India (Table 4). While Myanmar and Thailand have more homogenous HIV prevalence among populations living in different geographical areas, the epidemic is more concentrated in some states and districts in India and among high-risk population groups in Bangladesh, Nepal and Indonesia. HIV prevalence is estimated to be low in Bhutan, Maldives, Sri Lanka and Timor-Leste. HIV has till date not been reported from DPR Korea.
### Table 4: Estimated HIV prevalence among adult populations and the number of people living with HIV infection in Member States of the South-East Asia Region, 2011

<table>
<thead>
<tr>
<th>Country</th>
<th>Proportion of Adults newly infected with HIV (Incidence)</th>
<th>Estimated number of people newly infected with HIV</th>
<th>Proportion (%) of adult population infected with HIV (prevalence)</th>
<th>Estimated number of people living with HIV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>&lt;0.01</td>
<td>1 300</td>
<td>&lt;0.1</td>
<td>7 700</td>
</tr>
<tr>
<td>Bhutan</td>
<td>0.06</td>
<td>&lt;500</td>
<td>0.3</td>
<td>1 300</td>
</tr>
<tr>
<td>DPR Korea</td>
<td>No reported HIV positive individual till date</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>0.02</td>
<td>130 000</td>
<td>0.3</td>
<td>2 000 000</td>
</tr>
<tr>
<td>Indonesia</td>
<td>0.04</td>
<td>55 000</td>
<td>0.3</td>
<td>380 000</td>
</tr>
<tr>
<td>Maldives</td>
<td>&lt;0.01</td>
<td>&lt;100</td>
<td>&lt;0.1</td>
<td>&lt;100</td>
</tr>
<tr>
<td>Myanmar</td>
<td>0.03</td>
<td>8 800</td>
<td>0.6</td>
<td>220 000</td>
</tr>
<tr>
<td>Nepal</td>
<td>&lt;0.01</td>
<td>1 400</td>
<td>0.3</td>
<td>49 000</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>&lt;0.01</td>
<td>&lt;1000</td>
<td>&lt;0.1</td>
<td>4 200</td>
</tr>
<tr>
<td>Thailand</td>
<td>0.03</td>
<td>9 700</td>
<td>1.2</td>
<td>490 000</td>
</tr>
<tr>
<td>Timor-Leste</td>
<td>–</td>
<td>–</td>
<td>&lt;0.1</td>
<td>&lt;1 000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>0.02</strong></td>
<td><strong>211 000</strong></td>
<td><strong>0.3</strong></td>
<td><strong>3.46 million</strong></td>
</tr>
</tbody>
</table>

Source: UNAIDS estimations 2012; *India estimations by National AIDS control Organization India (NACO)

Note: Figures are rounded off. Data shown are the best available estimates.

A significant proportion of PLHIVs are also infected with tubercule bacilli and are thus at a high risk of developing TB. However, most of the incident TB cases continue to emerge among HIV-negative people.

The estimated incidence of HIV-positive TB cases in 2011 is 140 000 (7.7 per 100 000 population) in the whole South-East Asia Region, but varies widely among countries (Table 5).

In SEAR, most of the countries use direct measurement of the prevalence of HIV among incident cases of TB, through national surveys, HIV sentinel
surveillance, provider-initiated testing and counselling with at least 50% coverage of testing (the latest only for Thailand).

Table 5: HIV–TB Burden in Member States of the South-East Asia Region, 2011

<table>
<thead>
<tr>
<th>Country</th>
<th>Prevalence of all forms of TB</th>
<th>Number of HIV positive TB patients notified</th>
<th>Incidence of HIV-positive TB cases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Rate per 100 000 population</td>
<td>Number</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>620 000</td>
<td>411</td>
<td>81</td>
</tr>
<tr>
<td>Bhutan</td>
<td>1 700</td>
<td>230</td>
<td>–</td>
</tr>
<tr>
<td>DPR Korea</td>
<td>100 000</td>
<td>422</td>
<td>0</td>
</tr>
<tr>
<td>India</td>
<td>3 100 000</td>
<td>249</td>
<td>44 702</td>
</tr>
<tr>
<td>Indonesia</td>
<td>680 000</td>
<td>281</td>
<td>1 280</td>
</tr>
<tr>
<td>Maldives</td>
<td>140</td>
<td>44</td>
<td>0</td>
</tr>
<tr>
<td>Myanmar</td>
<td>240 000</td>
<td>506</td>
<td>900</td>
</tr>
<tr>
<td>Nepal</td>
<td>74 000</td>
<td>243</td>
<td>0</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>21 000</td>
<td>101</td>
<td>21</td>
</tr>
<tr>
<td>Thailand</td>
<td>110 000</td>
<td>161</td>
<td>7 326</td>
</tr>
<tr>
<td>Timor-Leste</td>
<td>8 100</td>
<td>–</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>5 million</td>
<td>271</td>
<td>54 314</td>
</tr>
</tbody>
</table>

Source: Global TB Control WHO Report, 2012
Note: Figures are rounded off. Data shown are the best available estimates
NA=not available

High TB case-fatality rates have been reported from certain areas with high HIV prevalence in India, Myanmar and Thailand.

2.4 Drug-resistant TB

Well-functioning national TB control programmes in the Region achieving high treatment success rates have resulted in maintaining a slow but steady decline in TB incidence rates during the past decade. This has also led to low levels (2.1, range: 1.8–2.5%) of multi drug-resistance (MDR) among newly detected cases. Among previously treated cases in the Region, MDR-TB rate
is estimated to be higher, around 16% (range: 12-19%). However, given the large numbers of TB cases in the South-East Asia Region, this translates to totally 89 000 estimated MDR-TB cases (72 000–108 000) accounting for more than one fourth of the world’s MDR-TB cases estimated to exist among notified TB cases in 2011. Four of the 27 high MDR-TB burden countries are in the South-East Asia Region.

Country-wise estimated burden of MDR-TB is based on nationwide drug resistance survey (DRS) or models based on sub-national DRS or generic model applied to the whole Region; estimates and sources of estimate are presented in Table 6.

Table 6: Estimated MDR-TB cases and rates in SEAR Member Countries, 2011

<table>
<thead>
<tr>
<th>Country</th>
<th>Source of estimates</th>
<th>% MDR among new TB cases (95% CI)</th>
<th>% MDR among previously treated TB cases (95% CI)</th>
<th>Estimated number of MDR-TB among all TB cases notified in 2011 (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>model</td>
<td>1.4 (0.7–2.5)</td>
<td>29 (24-34)</td>
<td>3 800 (2 550–5 500)</td>
</tr>
<tr>
<td>Bhutan</td>
<td>model</td>
<td>2.1 (1.8–2.5)</td>
<td>16 (12–19)</td>
<td>24 (20-28)</td>
</tr>
<tr>
<td>DPR Korea</td>
<td>model</td>
<td>2.1 (1.8–2.5)</td>
<td>16 (12–19)</td>
<td>3 500 (2 800–4 300)</td>
</tr>
<tr>
<td>India</td>
<td>model</td>
<td>2.1 (1.5–2.7)</td>
<td>15 (13–16)</td>
<td>66 000 (55 000–77 000)</td>
</tr>
<tr>
<td>Indonesia</td>
<td>model</td>
<td>1.9 (1.4–2.5)</td>
<td>12 (8.1–17)</td>
<td>6 620 (4 820–8 800)</td>
</tr>
<tr>
<td>Maldives</td>
<td>model</td>
<td>2.1 (1.8–2.5)</td>
<td>16 (12–19)</td>
<td>1 (1–2)</td>
</tr>
<tr>
<td>Myanmar</td>
<td>DRS, 2008</td>
<td>4.2 (3.1–5.6)</td>
<td>10(6.9–14)</td>
<td>5 500 (3 960–7 300)</td>
</tr>
<tr>
<td>Nepal</td>
<td>DRS, 2007</td>
<td>2.9 (1.8–4.3)</td>
<td>11.7 (7.2–18)</td>
<td>1 070 (670–1 610)</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>DRS, 2006</td>
<td>0.17 (0.0–0.99)</td>
<td>2.2 (1-4.1)</td>
<td>21 (4–84)</td>
</tr>
<tr>
<td>Thailand</td>
<td>DRS, 2006</td>
<td>1.7 (1.0–2.6)</td>
<td>35 (28–42)</td>
<td>2 190 (1 540–3 000)</td>
</tr>
<tr>
<td>Timor-Leste</td>
<td>model</td>
<td>2.1 (1.8–2.5)</td>
<td>16 (12–19)</td>
<td>95 (80-113)</td>
</tr>
<tr>
<td>SEAR</td>
<td>model</td>
<td>2.1 (1.8–2.5)</td>
<td>16 (12–19)</td>
<td>89 000 (72 000–108 000)</td>
</tr>
</tbody>
</table>

---

a Model based on sub-national and limited surveys conducted between 1995 and 2009. Results of national DRS completed in 2011 will be available in 2013.

b Estimates based on recent (2005) sub-national drug resistance surveys conducted in three states.

c Model based on two sub-national surveys: DRS in Mimika District in 2004 and Central Java province in 2006.

DRS = drug resistance surveillance or survey data; CI = confidence interval; MDR-TB = multidrug-resistant TB.
Extensively drug-resistant TB (XDR-TB) has also been reported from five countries (Bangladesh, India, Indonesia, Nepal and Thailand) in the Region.

In December 2011, Mumbai, India, also reported cases of so-called “totally drug-resistant TB” that posed an extremely difficult challenge to clinicians and public health authorities. The Indian government took important measures at the local and national levels. In Mumbai, laboratory and hospital facilities were improved; medical staff and funding were increased substantially; access to second-line drugs was provided to eligible patients; contact-tracing was enhanced, and efforts were made to train staff on drug-resistant TB and infection control. National regulations governing private sales of anti-TB medication were strengthened. By the end of 2012, all 35 states in the country are expected to provide programmatic management of drug-resistant TB. In May 2012, India made TB a notifiable disease.

Considerable efforts are required to expand capacity for quality-assured drug susceptibility testing in the Region in order to more accurately estimate the extent of drug-resistant TB. Given the widespread availability and use of second-line drugs, as laboratory capacity to conduct second-line drugs susceptibility testing increases, additional numbers of patients with XDR-TB are likely to be identified.
Achievements

3.1 DOTS coverage
DOTS coverage, defined as the proportion of population living in administrative areas with access to DOTS services, increased steadily from 1995 onwards. Almost the entire population of the Region had access to DOTS by the end of 2007 (Figure 9).

3.2 Case notifications
3.2.1 Trends in case notifications
Figure 10 shows the trends in the number of cases notified in the Region since 1993, for all forms of TB and new smear-positive (NSP) cases. Notifications continue to rise, reflecting case-finding efforts in Member States over time, with a sharper increase in notifications of all forms of TB, especially from 2000 to 2008, possibly due to increasing registration of smear-
negative and extra-pulmonary cases following the involvement of the private sector and medical teaching institutions.

**Figure 9: Population covered by DOTS services, SEA Region, 1995-2011**

Source: *Tuberculosis control in the South-East Asia Region, Annual Reports 1996-2012, WHO/SEARO*

**Figure 10: Trends in TB cases notified by type of case, in the South-East Asia Region, 1993-2011**

Sources: *Tuberculosis control in the South-East Asia Region, Annual Reports 1996-2012, WHO/SEARO; Annual Reports, National TB programmes, SEAR Member States, 2012*
The trends in notification rates of NSP cases for the five high-burden countries and other (intermediate and low burden) countries in the Region are presented in figures 11a and 11b respectively.

Figure 11a: Trends in annual NSP TB case notification rates for high-burden countries in the South-East Asia Region, 1995-2011

![Figure 11a](image_url)

Sources: *Tuberculosis control in the South-East Asia Region*, Annual Reports 1996-2012, WHO/SEARO; Annual Reports, National TB programmes, SEAR Member States, 2012

Figure 11b: Trends in annual NSP TB case notification rates for intermediate and low-burden countries in the SEA Region, 1995-2011

![Figure 11b](image_url)

Sources: *Tuberculosis control in the South-East Asia Region*, Annual Reports 1996-2012, WHO/SEARO; Annual Reports, National TB programmes, SEAR Member States, 2012
In Bangladesh, a rather sharp increasing trend was observed until 2006, following which notification rates have remained fairly stable, although some decrease is visible from 2010. In India, notification rates have continued to rise until 2009, primarily due to increased case-finding efforts and involvement of health care providers from other sectors in programme case-finding and treatment activities; in the latest years, the trend is rather stable. In Indonesia, after a period of steady increase, there was a drop in NSP notification rates in 2007, attributed to the temporary cessation of Global Fund support for a period of nine months; afterwards, notification rates started to slightly increase again. In Myanmar, a steady increase in notification rates has been observed from the year 2000 to 2007. The decline in 2008, and further decline in 2009, may be related to funding problems; in 2010 and 2011, the trends do not show any significant increase. A slightly declining trend has been observed in Thailand since 2005, but is reversing from 2009.

In DPR Korea, a sharp increase in the notification rates has been observed since 2006. This was primarily due to introduction of active case-finding and involvement of other sectors. Active case-finding was adopted as a supplementary strategy, since a big gap was observed between case notification rates and the revised estimates of the incidence of TB in the country, following a national tuberculin survey among children in the year 2007, which revealed a high ARTI. In Sri Lanka, a small increase in notifications was recorded until 2000, followed by fairly stable trend until 2011. In Nepal, some increase in notification rate was observed in the 1990s, but the trend reversed and very slightly declined until 2011, despite case-finding efforts and increased coverage of TB services. In Bhutan, after a declining slope in 2000–2005, a steady increase is observed since 2007; however, in 2011, this increasing trend seems to revert. A consistently declining trend has been observed in Maldives in the last 15 years. The trends in Timor-Leste reflect periods of civil strife when services were seriously disrupted for considerable periods of time; from 2009, notification rates have been increasing significantly.

3.2.2 Case notifications in 2011

Table 7 shows the absolute numbers of cases notified by type of TB, in each Member country for the year 2011. The 11 Member countries of the South-East Asia Region together notified 2 138 691 cases of tuberculosis (new and
relapses, all forms) which represents a case notification rate of 116 per 100,000 population; of those, 1,067,367 were new smear-positive pulmonary cases (59% of all new pulmonary cases and relapse). Five countries in the Region (Bangladesh, India, Indonesia, Myanmar and Thailand), which belong to the global list of 22 countries with the highest burdens of TB (HBCs), notified a total of 2,203,563 cases, or 94% of all cases notified in the Region.

There was an increase of 0.7% in the numbers of cases (all forms) notified in 2011 as compared to 2010 (Table 7); this small increase is mainly driven by new smear-positive cases, relapses and other re-treatment. Although relapses and other re-treatment seem to have increased from 2010 to 2011, it is difficult to evaluate whether this change reflects epidemiological variation, or it is due to changes in the recording and reporting system: in fact, it is likely that certain types of re-treatment cases are still underreported or misclassified in some countries.

About half of all notified new cases in the Region (53%) were new smear-positive cases (Figure 12). This proportion was considerably lower in Bhutan (32%), Myanmar (32%), DPR Korea (37%), and Timor-Leste (37%); on the other hand, the proportion is substantially higher in Bangladesh (67%).

Amongst all new cases of PTB, 64% were smear-positive in the Region as a whole, ranging from 40% in Timor-Leste to 82% in Bangladesh.

Seventeen percent of all new cases in the Region were extra-pulmonary cases. This proportion varied largely in different countries, going from a minimum of 5% in Indonesia to maximum of 49% in Bhutan (Figure 12).

The proportion of smear-positive re-treatment cases out of all smear-positive cases was 18% in the whole Region, ranging between 2% (in Maldives) and 24% (in India) (Figure 13). Low proportions of retreatment smear-positive cases were also reported by Bangladesh (4%), Indonesia (3%), Sri Lanka (8%) Thailand (8%) and Timor-Leste (4%). The proportion of relapses out of all smear-positive cases was on regional average 10%, ranging between 2% and 14%, with the highest proportions in DPR Korea (14%), India (13%) and Nepal (13%).
Table 7: Estimated incidence and cases notified (by type of TB patients) in the Member countries, in the South-East Asia Region, 2011

<table>
<thead>
<tr>
<th>Country</th>
<th>Estimated incidence - All forms (in thousands with (confidence intervals))</th>
<th>New smear-positive</th>
<th>New smear-negative</th>
<th>New extra-pulmonary</th>
<th>Relapse</th>
<th>Treatment after failure</th>
<th>Treatment after default</th>
<th>Other re-treatment</th>
<th>Type unknown*</th>
<th>Total notifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>340 (280-400)</td>
<td>98 948</td>
<td>21 921</td>
<td>27 329</td>
<td>2 701</td>
<td>886</td>
<td>320</td>
<td>3 459</td>
<td>0</td>
<td>155 564</td>
</tr>
<tr>
<td>Bhutan</td>
<td>1.4 (1.2-1.6)</td>
<td>382</td>
<td>225</td>
<td>573</td>
<td>55</td>
<td>10</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>1 250</td>
</tr>
<tr>
<td>DPR Korea</td>
<td>84 (72-97)</td>
<td>31 279</td>
<td>37 457</td>
<td>16 828</td>
<td>5 869</td>
<td>2 320</td>
<td>1 193</td>
<td>4 125</td>
<td>0</td>
<td>99 071</td>
</tr>
<tr>
<td>India</td>
<td>2200 (2000-2500)</td>
<td>642 321</td>
<td>340 203</td>
<td>226 965</td>
<td>112 508</td>
<td>17 304</td>
<td>72 787</td>
<td>101 832</td>
<td>1 952</td>
<td>1 515 872</td>
</tr>
<tr>
<td>Indonesia</td>
<td>450 (370-540)</td>
<td>197 797</td>
<td>101 750</td>
<td>14 054</td>
<td>5 348</td>
<td>432</td>
<td>933</td>
<td>994</td>
<td>0</td>
<td>321 308</td>
</tr>
<tr>
<td>Maldives</td>
<td>0.11 (0.09-0.12)</td>
<td>47</td>
<td>12</td>
<td>28</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>88</td>
</tr>
<tr>
<td>Myanmar</td>
<td>180 (160-210)</td>
<td>42 324</td>
<td>62 038</td>
<td>27 769</td>
<td>4 606</td>
<td>1 525</td>
<td>542</td>
<td>4 336</td>
<td>0</td>
<td>143 140</td>
</tr>
<tr>
<td>Nepal</td>
<td>50 (41-59)</td>
<td>15 000</td>
<td>9662</td>
<td>7 484</td>
<td>2 362</td>
<td>279</td>
<td>241</td>
<td>0</td>
<td>926</td>
<td>35 954</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>14 (11-17)</td>
<td>4 490</td>
<td>2 405</td>
<td>2 612</td>
<td>248</td>
<td>75</td>
<td>72</td>
<td>0</td>
<td>426</td>
<td>10 328</td>
</tr>
<tr>
<td>Thailand</td>
<td>86 (71-100)</td>
<td>33 169</td>
<td>20 729</td>
<td>10 014</td>
<td>1 915</td>
<td>406</td>
<td>556</td>
<td>890</td>
<td>0</td>
<td>67 679</td>
</tr>
<tr>
<td>Timor-Leste</td>
<td>--**</td>
<td>1 610</td>
<td>2 401</td>
<td>337</td>
<td>38</td>
<td>14</td>
<td>17</td>
<td>0</td>
<td>0</td>
<td>4 417</td>
</tr>
<tr>
<td><strong>SEA Region</strong></td>
<td>3 500 (3 200–3 700)</td>
<td>1 067 367</td>
<td>598 803</td>
<td>333 993</td>
<td>135 650</td>
<td>23 252</td>
<td>76 666</td>
<td>115 636</td>
<td>3 304</td>
<td>2 354 671</td>
</tr>
<tr>
<td><strong>SEA Region</strong> (2010)</td>
<td>3 500 (3 200–3 700)</td>
<td>1 048 543</td>
<td>618 316</td>
<td>328 789</td>
<td>130 766</td>
<td>25 030</td>
<td>76 537</td>
<td>106 985</td>
<td>2 626</td>
<td>2 337 592</td>
</tr>
</tbody>
</table>

*This category includes “cases with unknown history of previous treatment”, except for India and Nepal that includes “other new cases”
** Timor-Leste incidence estimates calculated with methodology revised by WHO in 2010, is to be revised upon availability of better quality data. Therefore, no figure is reported for the country (in this table). Refer to country profile for further details.

Figure 12: Proportion of smear-positive pulmonary TB (PTB), smear negative PTB and extra-pulmonary TB cases out of all new notified cases in the Member States of the South-East Asia Region, 2011

Source: Annual Reports, National TB programmes, SEAR Member States, 2012.

Figure 13: Proportions of different types of smear-positive cases among all smear-positive cases reported, in the Member States of the South-East Asia Region, 2011

Source: Annual Reports, National TB programmes, SEAR Member States, 2012
An increasing trend in the proportion of relapse cases out of all newly notified (new and relapse) smear-positive cases was seen over the previous years, in the decade between 1995 and 2005, in Bhutan, India and Nepal; since 2005, the proportion of relapses was rather stable for most of the countries, with a slight increase in DPR Korea and decrease in Maldives. Myanmar showed a consistent decrease of proportion of relapses since 1995.

### 3.2.3 Age-and sex distribution of notified NSP cases in 2011

Figure 14 shows the distribution of notified new smear-positive cases by age and sex in 2011 in the Region as a whole; approximately 76% of the cases belonged to the most productive age groups between 15-54 years; 74% among males and 80% among females. Compared to 2010, there is a minor increase of cases belonging to >54 years, both among male and female.

In 2011, the percentage of 0-14 year old cases among NSP is 1.6 for the whole Region (0.9% among males and 3.0% among females). There is variability among countries, with Nepal reporting the highest proportion of paediatric cases among NSP (3.3%) and Thailand reporting the lowest (0.3%). The proportion of paediatric cases among other types of TB cases can be analysed for all countries, but Myanmar, Nepal and Thailand do not report breakdown by age and groups for cases other than NSP (India reports breakdown by age but not by sex); therefore, for 8 of the 11 Member States of the South-East Asia Region, the average proportion of paediatric cases among new smear-negative and new extra-pulmonary cases was 13% and 14% respectively. Indonesia and Timor-Leste have the highest proportion of paediatric cases among new smear-negative (27% and 23%, respectively) and new extra-pulmonary cases (31% and 20%, respectively). For the eight countries, the overall proportion of paediatric cases among new reported TB case was 7%, ranging from 3% in Bangladesh to 18% in Timor-Leste. In 2011, breakdown by 0-4 and 5-14 years of age was reported by Bangladesh, DPR Korea, Indonesia, Maldives and Sri Lanka.

The male to female ratio of the notified NSP cases in 2011 varied from 1.2 in Bhutan and Timor-Leste to 2.7 in Sri Lanka, and was 2.0 for the Region as a whole. Male to female ratio in the Region progressively increased from 0.6:3.3 in the age groups from 0-14:65+. 
3.3 Treatment outcomes

The treatment success rate among new smear-positive cases enrolled for treatment during 2010 was 89% in the Region as a whole. Ten of the 11 Member countries reached 85% treatment success rate target and the newly set target of 90% success rate by 2015 was already reached or surpassed by 5 of the 11 Member States in the Region (Table 8). The overall cure rate in the Region for new smear-positive cases was 85% and the completion rate 4%, for the 1 045 179 cases registered in 2010.

The overall case fatality rate (CFR), default and failure rates were 4%, 5% and 2% respectively among new smear-positive cases registered for treatment in 2010.

In Maldives, the treatment success among NSP cases was lower than the target; however, it was much higher than in the previous cohort (it was 78% among 2009 cohort) due to a decrease in the number of defaulting patients that in the past was probably due to recent changes in structure of the NTP leading to problems in follow-up of patients and recording and reporting. Small numbers in Maldives create high fluctuation of figures for other unsuccessful treatment outcomes over time.
High default rates (>5%) among NSP cases were observed in India.

Higher case-fatality rates were registered in Myanmar (5%), Sri Lanka (7%) and Thailand (7%). In Myanmar and Thailand, relatively high case fatality may be partially explained by high mortality among HIV-positive NSP cases, being respectively 20% and 17%.

As expected, the success rate among re-treatment cases is lower than in new cases, being 75% for the whole Region and ranging from 66% to 86% within the countries. Similarly, the case fatality rate and failure rate among the re-treatment cases are higher, being respectively 7% and 4% for the whole Region; case fatality is ranging between 1% in Bhutan and Timor-Leste and 12% in Thailand, while failure rate is ranging between 2% in Bangladesh and Sri Lanka and 8% in DPR Korea. Default rate among retreatment cases is high in the Region (12%), and is particularly high in India (13%), Indonesia (11%) and Sri Lanka (9%), although in all countries defaulting rate is slightly decreasing. These high default rates among re-treatment cases are a cause of concern, as well as rates of failure in DPR Korea (8%) and Bhutan (7%), since many of these cases could be expected to have multi-drug resistance.

3.4 Reporting progress towards global targets

With the fifteenth annual report, “Global Tuberculosis Control 2010”, WHO ceased publishing data on case detection rate of new smear-positive TB cases. CDR of new smear-positive TB >70% is no longer a global target. One of the reasons behind this decision is the difficulty in obtaining reliable estimates of the denominator of this indicator that is not routinely directly measurable. Moreover, the current focus on universal case detection, supported by expansion of newer diagnostics that allow increasingly rapid definite diagnosis of smear-negative TB, make the emphasis on the detection of only smear-positive cases increasingly outdated.

To monitor the performance of TB control efforts in the country, the focus will be on case notifications (in absolute numbers and rates) and treatment success rate, which are both directly measurable and important indicators of the quality of TB management and care. No target has been set for case notification. On the other hand, the global target for treatment success rate by 2015 has been increased to 90%.
### Table 8: Treatment outcomes expressed as percentage among cases notified in 2010 by type of cases in the Member States of the South-East Asia Region

<table>
<thead>
<tr>
<th>Countries</th>
<th>New smear-positive cases</th>
<th>Re-treatment cases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Notified (number)</td>
<td>Success rate</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>105 659</td>
<td>92</td>
</tr>
<tr>
<td>Bhutan</td>
<td>454</td>
<td>90</td>
</tr>
<tr>
<td>DPR Korea</td>
<td>31 240</td>
<td>90</td>
</tr>
<tr>
<td>India</td>
<td>630 165</td>
<td>88</td>
</tr>
<tr>
<td>Indonesia</td>
<td>183 366</td>
<td>90</td>
</tr>
<tr>
<td>Maldives</td>
<td>44</td>
<td>82</td>
</tr>
<tr>
<td>Myanmar</td>
<td>42 200</td>
<td>86</td>
</tr>
<tr>
<td>Nepal</td>
<td>15 569</td>
<td>90</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>4 635</td>
<td>86</td>
</tr>
<tr>
<td>Thailand</td>
<td>30 317</td>
<td>85</td>
</tr>
<tr>
<td>Timor-Leste</td>
<td>1 530</td>
<td>88</td>
</tr>
<tr>
<td>SEAR</td>
<td>1 045 179</td>
<td>89</td>
</tr>
</tbody>
</table>

Source: Annual Reports, National TB programmes, SEAR Member States, 2012;

N.B. Sum of treatment outcomes may be >100% due to rounding of decimals. For some countries there are discrepancies between cases notified in 2010, published in previous reports and cases notified reported as denominator in this table. Figures may change due to delayed reporting of some units, data quality checks during the past year, revision of completeness of surveillance data, etc.
In 2011, SEA reached 89% treatment success rate among new smear-positive cases, with 5 of the 11 Member States reaching or surpassing the 90% target. The whole Region is well on track to reach the 90% target by 2015.

Case notification rate of all forms of TB is steadily increasing since 2000, at a slower pace in the last three years (Figure 15). However, notification rate in 2011 is still far from estimated TB incidence that represents the ideal goal in terms of universal access; in 2011, the estimated case detection rate of all TB cases was 62 (58–66).

Regarding the Stop TB partnership’s targets of halving prevalence and mortality rates compared to the 1990 baseline, the South-East Asia Region is on track to reach both targets. In fact, according to figures 16 and 17, considering only the best estimate, not taking into account uncertainty bands, in 2011, both the prevalence and mortality rates decreased by 39%; according to the projections based on the assumption that the current trend will not change, the Region would reach 50% reduction of baseline data.
According to WHO estimates, the incidence rate has started reverting, compared to the 1990 baseline (Figure 15), mainly driven by high burden countries such as India.
Key milestones achieved in 2012

4.1 DOTS
The entire population in the Region is living within access to DOTS services since 2007. Considering DOTS coverage and continuous increase of cases notified over time, with more than 20 million TB patients treated during the past 10 years, the South-East Asia Region is on the move towards universal access.

4.2 Strengthening national laboratory networks
Quality assured smear microscopy services are available through increasingly larger laboratory networks in all the 11 Member States.

National Reference Laboratories (NRLs) in all Member countries (with the exception of Maldives and Timor-Leste) have capacity for
mycobacterial culture and DST. Although this capacity is limited in some countries, efforts have been made to strengthen laboratory capacity within countries according to national plans and with the support of supranational reference laboratories (SNRL).

At least one national reference laboratory has recently been accredited for quality assurance for culture and drug susceptibility testing in Bangladesh, DPR Korea, Indonesia, Myanmar, Nepal and Sri Lanka. In Bangladesh, the creation of regional reference laboratories for culture and DST is ongoing in a phased manner. In Bhutan, the Public Health Laboratory has been accredited for culture and DST and culture facilities are being upgraded in two reference hospitals. In Indonesia, there are currently 46 culture facilities but only 5 have been quality assured in 2011. In Nepal, a National Reference Laboratory with culture and DST facilities was established in 2011; it is quality-assured by the SNRL at Gauting, Germany that is also supervising the GENETUP (NGO-run accredited laboratory working in close collaboration with the NTP). India relies on a network of 44 accredited laboratories for culture and DST, 31 of which are also implementing rapid tests through LPA. In Thailand, the capacity for first-line DST is being expanded, establishing culture facilities at selected regional laboratories, also implementing rapid DST (specifically HAIN Genotype MTBDRplus test), and the country has several private sector laboratories undertaking culture and DST. Quality assurance is a challenge: in 2011, all 15 established DST facilities, but only 45 of the existing 65 culture facilities were quality assured.

All 11 countries have formally established linkages with SNRLs, within and outside the Region. The National Institute of Research in Tuberculosis formerly Tuberculosis Research Centre, Chennai, India, and the Bureau of TB at Bangkok, Thailand, are the two designated supra-national TB reference laboratories in this Region. These two laboratories are part of a global network of 26 supra-national reference laboratories. However, NRL in some countries are linked up to SRLs outside the Region: Bangladesh to the SRL in Antwerp, Belgium; DPR Korea to the SRL in Hong Kong; Indonesia and Timor- Leste to the laboratory at Adelaide, Australia, and Nepal to the Gauting laboratory in Germany.

The national reference laboratories in India, Indonesia, Nepal and Thailand are currently undertaking DST for second-line anti-TB drugs to determine the extent of XDR-TB.
Reference laboratories in Bangladesh, Indonesia, Myanmar and Nepal are also engaged in rapid surveys for XDR-TB among mycobacterial isolates from patients who have failed re-treatment regimens, through in-country facilities or linking with the SRNLs in the global network.

Efforts are also ongoing to introduce the newer molecular and liquid culture technology for the management of MDR TB in high-burden countries in the Region with the assistance of the EXPAND TB project, with support from the global laboratory initiative (GLI), FIND and SEARO.

Following WHO endorsement to Xpert MTB/RIF as a rapid test for diagnosis of TB and resistance to rifampicin, and the issuance of guidelines, 6 of the 11 Member States in the Region are adopting, testing or scaling up Xpert MTB/RIF. Bangladesh installed Xpert in 12 sites and developed training manuals; DPR Korea installed one machine in the NRL; India installed Xpert in 18 sites for field demonstration to guide rapid scale up throughout the country; Indonesia started with five implementation sites; Myanmar is also planning expansion of the test to all States/Regions; Thailand implemented Xpert in nine sites that also have access to other rapid DST tests. Nepal got eight machines and cartridges granted by UNITAID that will be soon deployed in the country.

4.3 Addressing TB–HIV, MDR-TB, and other challenges

4.3.1 TB–HIV

An estimated 3.46 million persons are estimated to be living with HIV/AIDS in the South-East Asia Region. The Region is distinguished by a complex, heterogeneous HIV epidemic at different stages across different countries and geographical areas within individual countries. For example, approximately two-thirds of the estimated HIV burden in India is in six states in the south and north-east, which make up only a third of the country’s population. In four states in southern India, HIV prevalence appears to be slowly decreasing. In Indonesia, where the overall prevalence of HIV is low, three provinces have been reported to have much higher rates of HIV. In other countries, such as Bangladesh and Nepal, increasing HIV prevalence among high risk groups such as IDUs, has raised concerns about the potential risk of a generalized HIV epidemic.
Regionally, the number of new infections every year is showing a downward trend in four of the five high HIV burden countries, namely India, Myanmar, Nepal and Thailand; in Indonesia, the HIV epidemic is still on the rise (Figure 18).

Figure 18: Estimated number of new HIV infections in five Member States and in the South-East Asia Region, 1990-2011

Source: Number of new infections estimated by Spectrum model using surveillance data reported by national AIDS programmes, Member countries, South-East Asia Region

The South-East Asia Region accounts for about 13% of the global burden of new HIV-positive tuberculosis cases. HIV prevalence among new TB patients is 5.2%.

The need to urgently address TB–HIV is well understood in the Region. A Regional Strategic Plan for TB–HIV has been developed, adapting global strategies and guidelines to the unique needs of the Region.

National TB–HIV policies and guidelines, and a comprehensive package of interventions (i.e. joint advocacy, coordination, training of staff, integrated service delivery, referral of patients, etc.) are being implemented in 10 countries. Thailand continues to lead the Region in implementing TB–HIV activities. Services are being further expanded in India (all States covered
Intensified case-finding is steadily increasing at integrated HIV counselling; testing and care centres and cross-referrals between the TB and HIV programmes have been strengthened; integrated management is becoming more widely available as HIV services expand. In 2011, in the South-East Asia Region, totally 32% of TB patients knew their HIV status, and 89% and 59% of TB–HIV co-infected patients were put on CPT and ART respectively. Although progress is still to be made, the Region is rapidly achieving increasingly higher targets in the TB–HIV collaborative activities. Infection control measures have been included in national plans in Bangladesh, Bhutan, DPR Korea, India, Indonesia, Myanmar, Nepal, Sri Lanka and Thailand.

The TB recording and reporting systems in countries have been revised to include information on TB–HIV co-infection. However, the availability of data on HIV among TB cases remains suboptimal in some countries and there is an urgent need to scale up and report on the screening of TB cases for HIV infection, and vice versa.

Isoniazid preventive treatment (IPT) proves to be difficult to implement for several reasons and it is not mandated by policy in most countries. However, Myanmar and Thailand are implementing IPT in pilot townships/projects and India is conducting operational research on IPT; Bhutan and Maldives have included IPT in national guidelines.

**4.3.2 MDR-TB**

In 2011, the Regional Office published the “South-East-Asia Regional Response Plan for Drug-resistant TB Care and Control”. In 2012, the Regional Green Light Committee (rGLC) was established in the WHO Regional Office for South-East Asia. A Regional Advisory Committee on MDR-TB was also established to provide clear guidance on new policies and strategies for programmatic management on drug-resistant TB in the countries of the Region; the first and second meetings of the Committee were held in May and December 2012 respectively.

During recent years, steady progress has been made in the Region in initiating MDR-TB cases on treatment. The GLC had approved the case management of patients with MDR-TB under national programmes in 10
Member States. Bangladesh, India, Indonesia and Myanmar are in the process of expanding these services, while Nepal has already established ambulatory case management services for MDR-TB throughout the country. Maldives continues to treat the few cases that occur on a case-by-case basis. Bhutan and Sri Lanka had began enrolling cases in 2010, and Timor-Leste in 2011. DPR Korea developed PMDT guidelines in line with WHO recommendations, procured second line drugs through GDF and started enrolling patients of second-line treatment in mid-2012. In Thailand, MDR-TB treatment is presently provided at about 100 treatment units throughout the country, among which 4 were selected for the GLC project.

Poor availability of data about testing for drug resistance, number of MDR-TB cases detected and treatment outcomes suggests that recording and reporting system are challenging issues in most of the countries in the Region. For example, it appears that less than 1% of estimated cases of MDR-TB among notified new and retreatment cases has been tested for DST; in fact, most of the countries report that testing, although still considerably limited, is often done but not reported.

In 2011, more than 9000 patients with MDR-TB were registered for treatment in the Region (according to country reports), and by June 2012, only India reported about other 5200 patients initiated on second line treatment. Compared to the previous year, there is almost a twofold increase of reported MDR-TB cases put on treatment, due to the progress achieved in most of the countries. However, the numbers reported are often incomplete and inconsistent with the expansion of PMDT, showing a clear need for strengthening R&R for drug resistant cases.

Although the absolute number of TB cases tested for drug resistance, diagnosed with MDR-TB and started on appropriate treatment remains low, it is consistently increasing at the pace of implementation of plan for management of drug resistant TB. Initial treatment success rates of 80% and higher have been reported among the first cohorts of MDR-TB patients enrolled on second line treatment.

4.3.3 Paediatric TB

The first WHO guidance for national TB control programmes on management of tuberculosis in children was published in 2006, while the “Rapid Advice on
Treatment of Tuberculosis in Children” published in 2010 serves as a reference tool for countries to adapt to optimize outcomes, including the quality of life and survival of children with tuberculosis.

Guidelines for diagnosis and treatment of paediatric TB have been widely disseminated in India and Indonesia. In India, patient-wise drug boxes for children are also available under the programme. National guidelines for the management of childhood TB have been finalized in Bangladesh and Myanmar. In DPR Korea, training materials on paediatric TB treatment have been developed and training conducted. In Nepal, a Childhood TB Management section was introduced in the NTP General Manual. Bangladesh, Bhutan, DPR Korea, India, Myanmar, Nepal, Sri Lanka, Thailand and Timor-Leste received grants for anti-TB paediatric formulations through the Global Drug Facility (GDF).

Despite the above described achievements, paediatric TB remains a neglected area, as is shown by very low notification rate in the age group below 15 years of age. National guidelines should be widely disseminated and staff trained on paediatric TB management in all Member States in order to increase TB case detection in the paediatric population. All Member States need to revise national guidelines according to the rapid advice issued in October 2010 by WHO that provides evidence-based recommendations on the treatment of childhood TB, while considering the risks and benefits, feasibility, cost and financial implications.

In 2011, notification data with breakdown by paediatric age groups were available for five of the 11 Member States.

4.3.4 Other challenges

National plans for TB control in the 11 Member States are addressing the needs of populations at higher risk and living in cross-border areas according to each country specificity, pursuing higher and earlier case detection and quality case management.

Infection control measures have been included in national plans in Bangladesh, Bhutan, DPR Korea, India, Indonesia, Myanmar, Nepal, Sri Lanka Thailand and Timor-Leste.
4.4 Public and private partnerships

A major strategy towards increasing case detection and treatment success rates has been the inclusion of public health care providers operating outside the ministries of health, such as the railways, military, corporate sectors and prison health services, as well as private providers in TB management. Particularly, in some countries, the percentage of patients seeking services through the private health sector is very high. Currently, all Member countries have clear policies and strategies to involve other sectors. The contribution of case notification from these sectors stands to about 25%. In India, from 2012 onwards, the reporting from the private and non-NTP public sector is expected to increase due to the introduction of TB in the list of notifiable diseases.

Universities and medical schools are contributing to evidence-based policies and strategies through technical advisory groups at the national level.

The International Standards of TB Care have been endorsed by professional bodies- medical associations in Bangladesh, DPR Korea, India, Indonesia, Maldives, Myanmar, Nepal and Thailand. Intersectoral collaboration and public-private partnerships for delivery of services have been further scaled up in eight Member countries (Bangladesh, India, Indonesia, Myanmar, Nepal, Sri Lanka, Thailand and Timor-Leste). More than 1000 medical colleges, 25 000 private practitioners, 1800 large public and private hospitals, 250 corporate institutions, 2500 non governmental organizations, nearly 100 faith-based organizations and over 900 prisons are now working with national TB control programmes.

Other recent initiatives have been the formal inclusion of the principles and practices of TB control in pre-service training and the establishment of referral mechanisms by providing lists of DOTS centres to teaching institutes. More than 1000 private laboratories are now included in national diagnostic networks and undergo quality assurance mechanisms. Indonesia has intensified training of private and public hospital and laboratory staff. The country has also introduced coordination meetings between community health facilities and hospitals to improve transfer mechanisms between lung clinics and puskesmas. In Myanmar, services have been resumed throughout
the network of Sun Quality Clinics and the NTP plans further expansion of public-private mix services through the Myanmar Medical Association.

Partnership with international and national NGOs enables TB service delivery in remote areas and among marginalized populations in several countries of the Region. The work of Bangladesh Rural Advancement Committee (BRAC) and Damien through MOUs with the Government of Bangladesh is an outstanding example of large scale service delivery by NGOs that are contributing to achieving national targets for TB control.

Several thousand community-based initiatives are also being incorporated into routine service delivery by national programmes. However, successful approaches should be systematically documented in order to replicate winning models in similar settings in the countries of the Region.

Business alliances in the Region such as the Thai Business Coalition and the Business Alliance in India are emerging as players from the non-health private sector introducing TB services into their workplaces.

4.5 Surveillance, monitoring and evaluation
Efforts are being made to strengthen national TB surveillance systems, focusing on quality of data, through attention to ensuring completeness of case-reporting, accurate compilation and reporting of data.

In-depth analysis of several years’ programme data to determine trends was undertaken in India.

However, with the exception of the Bhutan and Maldives, trends in case notification rates cannot be used as proxy of trends in the incidence of TB. Population-based surveys, therefore, continue to serve as independent tools for evaluating the burden of TB and estimating the trends in the TB epidemic and impact of control strategies implemented in most countries.

Efforts were made to improve data on notification and monitoring of treatment outcomes of MDR-TB case, both on paper and electronic-based recording and reporting systems.

In 2012, joint monitoring missions on TB control were conducted in India and Maldives.
4.6 Resources for TB control

In the whole Region, domestic funding for TB control continues to account for about 50% of the funding for national TB control programmes; The Global Fund accounts for almost 45% of funding for TB activities. Ten Member countries currently benefit from funds mobilized through the Global Fund to over the previous rounds of GF grants. Applications to the Global Fund from Myanmar and DPR Korea have been approved during Round 8 and 9 respectively, and Bangladesh, Indonesia and Thailand have been approved for Round 10. Nepal is successfully implementing the National Strategy Application (NSA) grant. Bhutan, Sri Lanka and Timor-Leste received transitional fund from the Global Fund.

In addition, nine Member states benefit from funds from other development partners and donor governments with the exception of Bhutan and Maldives, where the only external funds are provided through WHO country budgets.

Despite the availability of funding through government and various donors in the Region, there is a funding gap of 24% for the overall budget of TB control programmes estimated for 2013.

Considering the threshold of 2.28 health professionals per 1000 population, 5 of the 11 Member States have sufficient human resources for health. Turnover of the staff, adequate training and management of human resources is a common challenge for most of the countries in the Region. Human resource development plans are available for six countries in the Region.

All 11 Member countries continue to access quality-assured affordable anti-TB drugs on a regular basis through grants or direct procurement services of the Global Drug Facility. All countries of the South-East Asia Region successfully transitioned from grants to direct procurement services using domestic sources, Global Fund, World Bank, or other sources of bilateral funding for adult anti-TB drugs. An exceptional extended GDF grant of drugs was secured for DPR Korea and Myanmar.
4.7 Operational research

National TB programmes and partners are engaged in carrying forward several operational research projects. Several other research projects are supported by WHO Country Offices through funds available at the country level from the Global Fund. Examples are: KAP studies in Bangladesh, Bhutan, Indonesia, Myanmar and Sri Lanka; public-private mix (PPM) models in Bangladesh and Myanmar; hospital DOTS in Indonesia; seasonality in TB notifications, ambulatory management and outcome from MDR-TB case management in Nepal; use of IPT in India and outcomes from cross-border TB control in Thailand; mortality studies in India, Indonesia and Myanmar and approaches to community-based TB care in several countries. National workshops on operations research, priority setting and dissemination are held regularly in India. India, in collaboration with Union and other stakeholders is conducting several operational researches.

Bangladesh, India, Indonesia, Myanmar, Nepal, Sri Lanka and Thailand were benefitted by several TBREACH approved projects.
WHO support in the Region in 2012

5.1 Technical assistance on implementation of STOP TB Strategy

All 11 Member States in the Region continue to receive technical assistance through the WHO Regional Office for South-East Asia and WHO country offices, in coordination and collaboration with international technical partners, namely, the Centers for Disease Control and prevention (CDC), USA, the International Centre for Veterinary and Medical Sciences in Australia, the Royal Foundation for Tuberculosis in the Netherlands (KNCV), US Agency for International Development (USAID), USAID supported TBCARE I and II, Foundation for Innovative New Diagnostics (FIND), PATH, the Institute of Tropical Medicine in Antwerp, Belgium, and the UNION. The three WHO
Collaborating Centres, namely, the National TB Institute (NTI), Bangalore, India, the National Institute of Research in Tuberculosis (NIRT) (formerly TB Research Centre - TRC), Chennai, India, and the SAARC TB and HIV/AIDS Centre in Kathmandu, Nepal, and technical partners based in countries in the Region have also actively provided technical assistance to national TB programmes during the year 2012.

To provide overall guidance to countries, SEARO updated and disseminated the Regional Strategic Plan 2012–2015 for TB control in the Region.

Technical missions to all 11 Member countries were undertaken during the year to provide support to national programmes in various areas, such as laboratory assessments and laboratory capacity building, development and implementation of guidelines and/or national strategies for TB, MDR-TB, TB–HIV, childhood TB, infection control, PPM, advocacy and social mobilization, improvement of drug procurement and supply management, human resource development, data management and use, and impact assessments. In this paragraph, details on some supported areas are reported; support to other areas is described in the following paragraphs.

Support was provided to review and update five-year national plans in Bangladesh, DPR Korea and India and NTP manual and guidelines on PMDT in Bangladesh, DPR Korea, Indonesia, Maldives and Thailand; to develop (1) national expansion plan for MDR-TB in Bangladesh, Bhutan, DPR Korea, India, Indonesia, Myanmar, Nepal, Sri Lanka and Thailand; (2) IC guidelines in Timor-Leste to support implementation of infection control plans in Bangladesh, India, Indonesia, Myanmar and Nepal, (3) TB–HIV framework and guidelines in Bhutan and Myanmar; (4) guidelines and training material, and conduct training on childhood TB in Bangladesh, DPR Korea and Myanmar; and (5) to elaborate a Human Resource Development plan for PMDT in Indonesia and Myanmar; and (6) to follow up on the implementation of Practical Approach to Lung Health in Bangladesh, Indonesia, Nepal and Maldives.

Monitoring missions were conducted in Bangladesh, Bhutan, DPR Korea, India, Indonesia, Myanmar, Nepal, Sri Lanka and Thailand with the assistance of rGLC, to assess the current situation and provide support to develop guidelines and conduct training for the management of MDR-TB cases. In Bangladesh, assistance was provided to elaborate the initial report on concluded DRS and DPR Korea was supported in the preparation of
preliminary DRS in Pyongyang planned for 2013. Technical assistance to India and Indonesia to develop strategies for implementation of PPM approach to management of MDR-TB is ongoing.

The TB Technical Assistance Mechanism (TBTEAM) was utilized to provide technical assistance to countries. SEAR TBTEAM focal point identified national TBTEAM focal point(s) in collaboration with all national and external partners involved in respective countries. SEAR TBTEAM regularly monitors the functioning of national TBTEAM focal point to ensure that information is up-to-date and that they are performing the tasks in the standard terms of reference for a national TBTEAM focal point. The regional roster of experts was further expanded and all proposed technical assistance missions to countries mapped, with the aim of deploying suitable consultants to meet the technical assistance requirements of countries. This will also serve to facilitate the seeking of additional funding from the Global Fund, TBREACH, UNITAID and other partners to support the necessary technical assistance to countries.

5.2 Regional Green Light Committee (rGLC)

To provide more coordinated and quality support to the implementation and expansion of programmatic management of drug resistant TB, the Regional GLC (rGLC) was established in 2012. The rGLC Secretariat has a memorandum of understanding with WHO/GF and its objective is to provide clear guidance on new policies and strategies for PMDT interventions in countries of the Region. The chair and members of the MDR-TB Advisory Committee were nominated, the rGLC “Package of services” was defined and the modus operandi endorsed. rGLC will support the implementation of the Regional Response Plan for MDR-TB, including the recording and reporting of the standard indicators selected for SEA Region. The MDR-TB Advisory Committee met twice during 2012.

5.3 Strengthening national laboratory networks

Technical assistance, coordinated through WHO, is being provided through the supra-national reference laboratories (SNRLs) based at the Institute of Medical and Veterinary Science (Australia), Institute of Tropical Medicine (Belgium), Central Reference Laboratory, Gauting (Germany), the National Institute of Research in Tuberculosis (formerly Tuberculosis Research Centre); the National Tuberculosis Institute, India, and at the Bureau of TB at Bangkok, Thailand, to help establish culture and drug susceptibility testing (DST)
facilities in countries in a phased manner, in line with national plans. All 11 countries have formally established linkages with SNRLs.

Continuous support to strengthen capacity for quality assurance, culture and DST, was provided to Bangladesh, Bhutan, DPR Korea, India, Indonesia, Myanmar, Nepal and Thailand. As a result, all 11 Member States have quality assured smear microscopy, culture and first-line DST (through in-country facilities or through linkage with SNRL) and two countries developed capacity for quality assured second line DST. Implementation of newer diagnostic tools was supported in Bangladesh, India, Indonesia, Myanmar, Nepal and Thailand.

EXPAND TB is a collaboration among WHO, the Global Laboratory Initiative (GLI), the Foundation for Innovative New Diagnostics (FIND) and GDF, to ensure access to quality-assured new diagnostic technologies, endorsed by WHO, including liquid culture, rapid speciation, rapid DST and molecular line probe assay; to make sure that diagnostic technologies are properly integrated into TB control programmes and implemented in appropriate laboratories in countries and local know-how and sustainability are promoted through technology transfer efforts. In 2011, the Expanding Access to New Diagnostics for TB (EXPAND TB) project was implemented in India and Myanmar; in 2012, it was expanded to Bangladesh and Indonesia. All four countries were provided technical assistance for the implementation of EXPAND TB projects throughout 2012.

5.4 Capacity building, information exchange

Training, exchange of information, at global and regional levels, and in-country capacity building have been the key areas of work for WHO regional and country staff during the past years.

In 2012, all Member States participated in four meetings organized by the South-East Asia Regional Office. Regional workshops on planning, implementation and monitoring of TB control and programmatic management of drug-resistant TB were held in May and September 2012 and the reports are available. A regional workshop was held in July 2012 to finalize the Regional Response Plan on TB–HIV collaborative activities. Another regional workshop on the new funding mechanism of the Global Fund was held in December 2012 and the new funding mechanism was illustrated and disseminated.
SAARC countries participated in the regional training on research methodology for protocol development on TB and HIV programmes, held in Bhutan on August 2012.

Bangladesh, Indonesia and Myanmar participated in the workshop on TB prevalence survey organized in Cambodia to build capacity on survey protocol development.

The regional and country offices also supported facilitation of several national level training courses as well as training held at the three WHO Collaborating Centres in the Region.

The WHO staff at regional and country levels participated in the Global Laboratory Initiative meeting to elaborate a plan to roll out the newer technology in the Region and in the Global Fund meeting to discuss the role of WHO. WHO staff of Myanmar and Sri Lanka participated in a consultative meeting on management of TB in complex situations to define a strategic outline for TB management in emergency situations.

Several technical group meetings and regional consultations were held in 2012. At the South-East Asia TB Technical Working Group meeting held in SEARO, experts discussed various policy issues. The first and second meetings of the MDR-TB Advisory Committee were held and reports are available. Country Coordination Mechanism (CCM) chairs and coordinators participated in the Regional Constitution Meeting of the Global Fund. The Regional Office for South-East Asia participated in a technical consultation on “Total Drug-Resistant TB” that did not provide a final definition for this newly reported and threatening form of TB. As in previous years, the Regional Office participated in WHO/HQ, bi-Regional and partner technical meetings, whose outcomes and recommendations were disseminated to countries for reference, follow-up and further action.

5.5 Resource mobilization
Several Member States were provided assistance in mobilizing resources from development partners and donor governments during the year.

Bhutan, Sri Lanka and Timor-Leste were supported to develop proposals for submission during the Global Fund Transitional Funding Mechanism (TFM) call for applications. Myanmar was supported in the preparation of a proposal for USAID funding. SEARO also submitted proposals for USAID funding.
The activities undertaken and coordinated by the TB unit at the Regional Office are supported almost entirely through USAID regional funding. Additional funds for technical assistance to countries are being sourced through the Office of Global AIDS Control (OGAC). The GLC was funded through USAID. Some funding also continued through the Stop TB department at WHO/HQ, for organizing regional workshops and to support deployment of staff working on TB in the Region.

5.6 **Ensuring regular supplies of drugs and improving procurement and supply management**

Assistance continued to be provided for timely procurement of anti-TB drugs through grants and direct procurement mechanisms. All 11 countries in the Region embarked on the use of Global Drug Facility services and products in one way or the other and accessed the low cost and quality-assured fixed dosage combination drugs. No stock-outs were reported from any country at the point of treatment delivery.

All countries in the Region successfully transitioned from grants to direct procurements in 2009 for first-line anti-TB drugs (FLD), adult formulation. In 2012, 9 of the 11 Member States received GDF grant for paediatric formulations of first line drugs. Second-line anti-TB drugs (SLD) were procured through GDF and funded by UNITAID or Global Fund: UNITAID supported counties are Myanmar, Nepal and Timor-Leste; Global Fund supports Bangladesh, Bhutan, DPR Korea, Indonesia and Sri Lanka; India is receiving support from both UNITAID and Global Fund. In Maldives, the Ministry of Health is procuring second-line drugs on a case-by-case basis; in Thailand, drugs are procured using local resources such as the Government Pharmaceutical Organization.

GDF monitoring missions were conducted in Bangladesh, DPR Korea, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka and Timor-Leste with the objective of strengthening drug management, improving practices and ensuring adherence to treatment regimens.

In 2012, the ongoing in-country technical support and training to strengthen procurement and supply management (PSM) was continued; PSM plans were developed in Bangladesh, India, Indonesia, Myanmar, Sri Lanka and Thailand.
In 2012, meeting of a drug manufacturers to promote and advocate for production of first and second line drugs was supported by the Regional Office.

5.7 Operational research
Countries were provided guidelines for submission of research proposals through the recently launched TBREACH initiative; Bangladesh, India, Indonesia, Myanmar, Nepal, Sri Lanka and Thailand submitted proposals concerning access to diagnosis and treatment of TB and/or MDR-TB and all were approved in 2011.

Bangladesh, India, Indonesia and Myanmar were supported in the elaboration of operational research protocols in order to address country needs and innovative approaches.

India, Myanmar and Thailand received assistance in developing protocols for initiating isoniazid preventive therapy (IPT) at selected sites and were supposed to have evidence for the implementation of IPT among people living with HIV/AIDS by early 2012.

5.8 Coordination, collaboration and partnerships
To mobilize greater commitment for TB control in the Region, WHO at country, regional and global levels continued to interact with several donor and development partners. The Region is represented on the Stop TB Coordinating Board and the Board of The Global Fund.

WHO regional and country staff participated and contributed to workshops and meetings held by WHO headquarters and partner agencies, namely: STAG meeting, Regional Advisers’ meeting, TBTEAM meeting, Global Planning meeting, Union Conference.

5.9 Advocacy, communication and social mobilization
The Regional Strategy for advocacy, communication and social mobilization (ACSM) was developed and a framework for ACSM activities at country level finalized.

Bangladesh and Indonesia were supported to develop advocacy and communication road maps, while Thailand received support to develop a national ACSM strategy.
Many community-based initiatives were established through the active involvement of NGOs in Bangladesh, India, Indonesia, Myanmar and Thailand. Ongoing ACSM activities need to be properly documented, analysed for cost-effectiveness and best practices emanating from these utilized for wider replication. In 2012, success stories on best practices on ACSM activities were available to all 11 Member States in the Region. Similarly, best practices on community-based initiatives and civil society organizations were mapped, documented and published.

All countries and the Regional Office observed the World TB Day for which advocacy materials were developed.

5.10 Monitoring and evaluation, and TB burden estimates

Over the last few years, impact assessments were supported in six Member States in the form of prevalence or annual risk of infection surveys in Bangladesh, Bhutan, India, Indonesia, Myanmar and Thailand; additionally mortality surveys were supported in India. In-depth analysis of several years’ programme data to determine trends were undertaken in India, Nepal and Sri Lanka. Indonesia was assisted in the revision of burden estimates.

In 2012, Thailand was supported in the ongoing implementation of prevalence survey; Indonesia was supported to develop protocol and complete the preparatory phase for the upcoming prevalence survey; Bangladesh received training on development of survey protocol, in preparation for future development in the next year.

In-country technical assistance for improving data management software and training on data management were completed in Bangladesh, India and Nepal. Bangladesh, Indonesia and Nepal are receiving continuous support, in collaboration with MSH, to establish the e-TB MIS (management information system).

Thailand received support to finalize the revised monitoring and evaluation plan. Countries were also assisted in further improving supervision and monitoring of programme performance.

Joint monitoring missions (JMM) on TB control were conducted in India and Maldives; protocol for JMM to be conducted in 2013 was developed for Thailand.
Country Profiles
Bangladesh

With a population of about 151 million, Bangladesh ranks sixth among countries with the highest burden of TB. The estimated prevalence and incidence rates of all forms of tuberculosis were respectively 411 and 225 per 100,000 population in 2011. Bangladesh completed the national TB prevalence survey in 2009 and is planning to conduct the next prevalence survey by 2015.

The number of peripheral laboratories performing smear microscopy was increased from 1050 in 2010 to 1057 in 2011, corresponding to 0.7 per 100,000 population to extend greater access to TB diagnostic services. For all microscopy laboratories, external quality assurance (EQA) was carried out, showing acceptable performance in 94% of them. The number of laboratories performing culture increased from one to three, two of which were also performing DST for first line drugs. In 2011, the notification rate of all forms of TB and new smear-positive cases were respectively 99 and 65, showing a slight decrease compared to previous years, particularly for sputum smear-positive cases. Treatment success rate among new smear-positive cases is steadily 92% for all the cohorts of patients registered since 2006, including 2010 cohort. Treatment success rates among smear-negative and retreatment cases were 89% and 80% respectively in the 2010 cohort.

The national TB guidelines were updated in line with more recent international recommendations in 2008. After piloting e-TB manager in 6 sites, it has been expanded to 20 more sites in 2012. NTP has planned to
establish e-TB manager in additional 80 sites in 2013 with support from MSH. At present, data are being collected from the field both in hard and soft copies and this will be continued until the e-TB manager will be fully operational throughout the country.

Childhood TB guidelines were published and four batches of ToT conducted in 2012. TB infection control operational guidelines were published in 2011. The operational guidelines for drug resistance TB were revised and SOP for programmatic management of drug-resistant tuberculosis (PMDT) developed in 2012.

Practical Approach to Lung Health (PAL) guidelines were finalized and two batches of ToT completed. After the ToT, 26 medical doctors were trained on PAL. Data from previous drug resistance surveys indicate low levels of MDR-TB. Isolated surveys indicated that MDR-TB rates among newly diagnosed cases range between 0.4% and 3% and among previously treated cases, between 3% and 15.4%. A limited survey of drug susceptibility among patients failing retreatment regimens showed that 88% had MDR-TB. A nationally representative population-based survey was completed in 2011 to assess the magnitude of drug resistance nationwide; results will be available in 2013. The National Tuberculosis Reference Laboratory was accredited for culture and DST by the Supranational Reference Laboratory Antwerp, Belgium in 2010, though linked since 2007. The National TB Reference Laboratory (NTRL) at the National Institute of Diseases of the Chest and Hospital (NIDCH) in Dhaka was upgraded and renovated. Establishment of additional regional reference laboratories for culture and drug susceptibility testing is ongoing in a phase-wise manner to cover the entire country.

A GLC-approved project for the management of MDR-TB cases started in August 2008 at the NIDCH, Dhaka and in 2011 at the Chest Disease Hospital in Chittagong. In 2008, 2009 and 2010 (as of end of September), confirmed enrolled MDR-TB patients were 104, 167 and 141 respectively. Among them, treatment success rates were 63%, 65% and 70% respectively. The Damien Foundation (NTP NGO partner) is providing MDR-TB services as an operational research project in designated geographical areas following a nine months’ regimen. The Damien Foundation (DF) has its own reference laboratory capable of performing culture and DST for first-line drugs. DF enrolled 172, 154 and 136 MDR-TB cases in 2009, 2010 and 2011 respectively and treatment success rates were 83%, 82% and 75% respectively.
HIV prevalence in the adult general population is low (less than 1%) in Bangladesh except for injecting drug users, among whom a recent survey revealed an HIV prevalence of 7%. This has raised concerns regarding the potential for transmission of HIV to other population groups. National TB–HIV operational guidelines were developed in 2009. While a national TB–HIV committee is now functional, collaboration between the National AIDS and STI programme and national TB programme for TB–HIV activities needs to be strengthened. A limited number of NGOs provide HIV counselling, prevention and care for TB–HIV co-infected individuals. Capacity building for wider implementation of TB–HIV interventions started in 2009 and is ongoing. The number of TB patients tested in 2011 for HIV was 1900 among the total 155 557 TB patients notified and all TB–HIV co-infected patients detected (53) started ART and CPT.

In 2010, for the first time, Bangladesh reported case notification for age groups 0-4 and 5-14 years, showing commitment towards addressing childhood TB.

TB services are part of an essential services package under the Health, Nutrition and Population Sector Program (HNPS), presently known as Health, Population and Nutrition Sector Development Program (HPNSDP) which is implemented through the primary health care system of the country. Bangladesh is an outstanding example of implementing TB control in partnership with NGOs. Community-based DOTS through village doctors and the network of shwasthyashebikas (community health volunteers) is the most common mechanism for supervising drug intake. Collaboration with garments manufacturers, which accounts for 3 million employees and one of the largest industrial sectors, was formalized and plans developed for providing TB services in these companies. Several private and corporate sectors are involved in TB control and in rendering services in line with international standards for TB care. Totally, 110 non-NTP public providers (including public hospitals, medical college hospitals, and military hospitals) and 85 private providers have been involved so far, contributing to about 20 000 TB cases notified in 2011. Services have also been established in the prison system.

The data management software was upgraded and financial management software installed. The international standard of TB care (ISTC) was formally endorsed by professional associations. An HRD plan was developed and a
focal point for HR designated at the central level. NTP guidelines included in the curricula for basic training of different categories of health staff and curriculum for undergraduate/post graduate medical, paramedical and nursing students on DOTS, TB–HIV, MDR-TB is under process.

The TB programme benefits from Global Fund support through rounds 3, 5, 8 and 10. This support is channelled through two principal recipients: the External Resource Division (ERD) of the Ministry of Finance (MoF) for NTP (Government) and BRAC for NGO consortium. WHO provides strong technical and operational support to the programme. In addition, USAID provides financial assistance to NTP directly while several other donors are funding TB activities through NGOs. Some support for TB control is also made available through the HNPSP.

**Major Achievements**

- the first national drug resistance survey (DRS) completed and the final report to be available very soon;
- the first national TB prevalence survey completed in 2009 and disseminated in 2010;
- the second national TB prevalence survey planned in 2013-14;
- preliminary work like workshop on methodology and budget estimation conducted with technical support from WHO and RIT;
- MDR-TB guidelines revised and updated;
- MDR-TB management piloted successfully in NIDCH and scaled up to one more site in Chittagong;
- guidelines for community-based MDR-TB finalized and piloted in four sites of four districts with implementation support by the partner (TB CARE II);
- upgrading and renovation of NTRL at NIDCH, Dhaka completed;
- further expansion of public-private mix TB and involvement of workplace e.g. BGMEA achieved;
- drug storage capacity strengthened by establishing a separate store in the newly constructed hospital at Shyamoli, Dhaka;
- piloting of e-TB manager initiated in six sites and expanded to twenty more sites in 2012;
- PAL guidelines finalized and two batches of ToT conducted in Sept 2012;
- training for two batches of medical doctors also was conducted;
- childhood TB guidelines published and ToT conducted in 2012;
- TB infection control operational guidelines published;
- the training manuals for Gene X-pert developed and twelve Gene X-pert machines installed in different sites in 2012.
- line probe assay (LPA) and liquid culture installed and functionalized in 2012.

**Major challenges**
- ensuring uninterrupted supply of drug and logistics;
- ensuring sustainability of skilled and trained staff at different levels;
- scaling up the management of DR-TB and community PMDT;
- further scaling up and strengthening private-public collaborative interventions;
- strengthening linkages with the national AIDS and STI programme for TB–HIV;
- quality control and sustaining the quality of DOTS ;
- strengthening system for diagnosis of smear-negative, extra-pulmonary and child TB cases.
- reaching hard-to-reach population in islands and different marshy lands.

**Planned activities in 2013**
- establishment of the regional reference laboratories at Khulna and Sylhet for culture and drug susceptibility testing in a phase-wise manner;
○ implementation of PAL
○ phase-wise expansion of TB–HIV collaborative activities;
○ developing capacity for wider implementation of TB–HIV, MDR-TB and PPM DOTS interventions;
○ further expanding private-public collaborative activities;
○ strengthening the procurement and supply management system;
○ strengthening supervision and monitoring;
○ scaling-up of e-TB manager to 80 sites;
○ implementation of TB infection control;
○ scaling up of comprehensive ACSM activities;
○ conducting an assessment of the impact of the IEC campaigns on the population and service recipients;
○ capacity building for diagnosis and management of smear-negative, extra-pulmonary and childhood TB; training for doctors and paediatricians for childhood TB to follow ToT;
○ establishing a pharmacovigilance system;
○ conducting drug quality assessment;
○ conducting operational research on validation of data, TB-diabetes relationship;
○ establishing LMIS;
○ scaling up of Gene X-pert sites.
Case notifications by type of patients, 2011

- **New smear-positive**: 63.6%
- **New smear-negative**: 14.1%
- **New extrapulmonary**: 17.6%
- **Relapse**: 1.7%
- **Treatment after failure**: 0.6%
- **Treatment after default**: 0.2%
- **Other**: 3%
- **Other retreatment**: 2.2%

Trends in notified new smear-positive TB cases by age group among males, 2001–2011

- **0-14 years**
- **15-24 years**
- **25-34 years**
- **35-44 years**
- **45-54 years**
- **55-64 years**
- **65+ years**

Trends in notified new smear-positive TB cases by age group among females, 2001–2011

- **0-14 years**
- **15-24 years**
- **25-34 years**
- **35-44 years**
- **45-54 years**
- **55-64 years**
- **65+ years**

Treatment outcomes of new smear-positive cases, 2010 cohort

- **Cured**: 90.4%
- **Completed**: 1.2%
- **Died**: 3.8%
- **Defaulted**: 1.8%
- **Failed**: 0.8%
- **Non-evaluated**: 2.0%

Trends in treatment outcomes of new smear-positive cases, 2000–2010

- **Success rate**
- **Died**
- **Failed**
- **Defaulted**
- **Non evaluated**

Trends in TB case notifications, 2001–2011

- **Cases per 100,000 population**
## Estimates and notification rates for 2011, Bangladesh

<table>
<thead>
<tr>
<th>Category</th>
<th>Estimate (2011)</th>
<th>Margin of Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population*</td>
<td>151 574 297</td>
<td></td>
</tr>
<tr>
<td>Incidence of all forms of TB</td>
<td>340 000</td>
<td>(280 000-400 000)</td>
</tr>
<tr>
<td>Incidence rate of all forms of TB (per 100 000 population per year)</td>
<td>225 (185-268)</td>
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<tr>
<td>Prevalence of all forms of TB</td>
<td>620 000</td>
<td>(300 000 -1 100 000)</td>
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<tr>
<td>Prevalence rate of all forms of TB (per 100 000 population)</td>
<td>411 (199-698)</td>
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<tr>
<td>TB death rate (of all forms of TB, excluding HIV per 100 000 population per year)</td>
<td>45 (19-82)</td>
<td></td>
</tr>
<tr>
<td>Notification rate of all forms of TB (per 100 000 population for the year 2011)</td>
<td>99</td>
<td></td>
</tr>
<tr>
<td>Notification rate of new smear-positive cases (per 100 000 population for the year 2011)</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>Case-detection rate (all forms of TB)</td>
<td>45 (37-54)</td>
<td></td>
</tr>
<tr>
<td>Treatment success rate (%) of new smear-positive cases for 2010 cohort</td>
<td>92</td>
<td></td>
</tr>
</tbody>
</table>

**Bhutan**

With a population of approximately 700,000 in 2011, Bhutan had estimated TB prevalence and incidence rate of all forms of TB respectively of 240 and 198 per 100,000 population. The notification rate of all forms of TB (new cases and relapses) and new smear-positive cases were 174 and 54 respectively, slightly reverting to the steady increase observed in previous years. The treatment success for the cohort of new smear-positive cases registered during 2010 was 90%; success rate is steadily equal to or above 90% since 2007. The TB control programme is fully integrated into the general health services with the majority of activities decentralized to the districts.

There is no representative data on the levels of anti-TB drug resistance in the country. Based on modelling, WHO estimated that 0.6% of newly diagnosed smear-positive TB cases have MDR-TB. The drug resistance surveillance started in 2010 is ongoing to better assess levels of drug-resistant TB in the country; preliminary results suggest higher drug resistance rate than WHO estimate. In 2011, 37% of all retreatment cases were notified and 4% of new cases tested for drug resistance. Of the 21 MDR-TB cases diagnosed in 2011, 12 were among re-treatment cases, 4 among cases with history unknown, and 5 were reported among new cases tested for DST.

The Public Health Laboratory (PHL) has been linked to the Regional Supra-National Reference Laboratory in Bangkok, Thailand, and accredited for culture and first-line DST. Culture facilities are being upgraded at the two regional referral hospitals. Additional laboratory staff were trained for
undertaking quality-assured culture and DST. DST is currently done for all re-treatment cases; it is being extended to all smear-positive cases initiated on treatment at a slow pace due to limited laboratory capacity. GLC approval for the management of MDR-TB cases was obtained in 2009, guidelines for MDR-TB management were finalized, medical doctors were trained on MDR-TB management and second line drugs are being procured through GDF.

NTCP has introduced fixed dose combination drugs (FDCs), replacing single drug formulations for first-line treatment for both adult and paediatric cases. The adult FDCs are procured through the Global Drug Facility (GDF) while paediatric formulations are supported through GDF grant. Guidelines on management of TB were revised and training conducted for medical doctors involved in TB control activities.

The prevalence of HIV infection in the general population is low, being 0.02%. HIV sentinel surveillance carried out annually has also revealed low levels of HIV infection among TB patients. Policies for referral of TB patients to HIV counselling and testing, CPT and ART are in place, as well as policy for IPT. Development of new TB–HIV guidelines, including recording and reporting system to capture implementation of collaborative activities, is ongoing. Subsequently a national body responsible for coordinating TB–HIV activities will be formed. TB–HIV collaborative activities are planned under the National Strategic Plan for TB Control 2012–2016.

A comprehensive HRD master plan is in place in the HR Division of the Ministry of Health. The programme coordinates with the Human Resource Division at the central level on HR issues.

There is strong collaboration between NTP and partners, including the military hospitals. All military hospitals are involved in delivering TB services. The national TB control programme is financially supported through the Government and Round 6 of the Global Fund.

**Major achievements**

The following are the major activities that were successfully conducted in the year 2011 up to the end of 2012.

- GFTFM grant secured to ensure continuity of key essential services;
MGIT machine for liquid culture installed;

GLC mission conducted;

ex-country and in-country training on DR-TB Management conducted;

technical assistance to develop TB–HIV collaborative guideline requested;

laboratory assessment visit by supra-national reference laboratory;

IEC material on TB printed and distributed; information and education messages aired on TV and radio slots;

commemoration of World TB Day observed;

FLD and SLD procured through GLC;

monitoring and supervision strengthened;

standard Manual on Sputum Smear Microscopy (2nd Edition) revised and refresher training conducted.

Major challenges

- ensuring practice of DOT throughout the course of treatment;
- emergence and gradual rise of MDR-TB;
- human resources, especially in terms of technical capacity;
- weak TB–HIV collaboration;
- ensuring adequate funding for TB control;
- delay in laboratory diagnosis of MDR-TB;
- inadequate community participation.

Planned activities in 2013

- developing TB–HIV collaborative guidelines;
- procuring FLD and SLD through GDF/GLC;
- establishing line probe assay for rapid diagnosis of MDR-TB;
strengthening monitoring, supervision and improvement of data management;

strengthening partnership with the indigenous unit for referral of presumptive TB cases;

strengthening the follow-up of cases using communication technology;

engaging multisectoral task force for ACSM;

strengthening laboratory and clinical capacity for diagnosis of MDR-TB;

improving access to TB services for vulnerable populations such as migrant workers and monastic institutions;

holding annual TB laboratory and TB review meetings;

arranging quality assessment visit to the PHL by the SNRL.
Case notifications by type of patients, 2011

- New smear-positive: 31%
- New smear-negative: 18%
- New extrapulmonary: 46%
- Relapse: 4%
- Treatment after failure: 0.8%
- Treatment after default: 0.4%
- Other: 1%
- Treatment: 0.8%

Notified new smear-positive TB cases by age group and sex, 2011

- Number of cases per 100,000 population
- Male
- Female

Treatment outcomes of new smear-positive cases, 2010 cohort

- Cured: 87%
- Completed: 3%
- Died: 3%
- Failed: 3%
- Defaulted: 1%
- Not evaluated: 2%

Trends in treatment outcomes of new smear-positive cases, 2000–2010

- Treatment success rate (%)
- Success rate
- Died
- Failed
- Defaulted
- Not evaluated
<table>
<thead>
<tr>
<th>Estimate/Rate</th>
<th>Value</th>
</tr>
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<tbody>
<tr>
<td>Population*</td>
<td>708,265</td>
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<tr>
<td>Incidence of all forms of TB</td>
<td>1400 (1200-1600)</td>
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<tr>
<td>Incidence rate of all forms of TB (per 100,000 population per year)**</td>
<td>198 (169-226)</td>
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<tr>
<td>Prevalence of all forms of TB</td>
<td>1,700 (600-3,400)</td>
</tr>
<tr>
<td>Prevalence rate of all forms of TB (per 100,000 population per year)**</td>
<td>240 (85-480)</td>
</tr>
<tr>
<td>TB death rate (of all forms of TB, excluding HIV per 100,000 population per year)**</td>
<td>18 (6.6-35)</td>
</tr>
<tr>
<td>Notification rate of all forms of TB (per 100,000 population for the year 2011)</td>
<td>174</td>
</tr>
<tr>
<td>Notification rate of new smear-positive cases (per 100,000 population for the year 2011)</td>
<td>54</td>
</tr>
<tr>
<td>Case-detection rate (all forms of TB)</td>
<td>88 (75-100)</td>
</tr>
<tr>
<td>Treatment success rate (%) of new smear-positive cases for 2010 cohort</td>
<td>90</td>
</tr>
</tbody>
</table>


**Estimated rates herewith reported slightly differ from the those published in WHO “Global Tuberculosis Report 2012” due to the use of different sources for population figures.
Democratic People’s Republic of Korea

With a population of about 25 million, the Democratic People’s Republic of Korea (DPR Korea) has an annual incidence and prevalence of TB (all forms) of, respectively, 345 and 422 per 100 000 population. In 2011, the notification rates of all forms of TB and new smear-positive cases were respectively 370 and 126, showing a steadily increasing trend over time, greater for all TB cases than smear-positive cases, and particularly important since 2007. The expected incidence was revised upwards significantly in 2007 following a national ARTI survey; at that time, given the significant gap between the estimated incidence and actual case notifications, intensified active case-finding in the community was adopted as supplementary method for case-finding. Moreover, integration of previously non-DOTS sectors such as health facilities under ministries of military, security and railways has led to an increase in case notifications. As a result, in 2011, the notification rate was double that of 2006, after active case-finding efforts were implemented. The burden estimates should be further revised upwards because in 2011, the estimated case detection rate was above 100%, suggesting that the current burden is underestimated. The treatment success rate of smear-positive TB cases has been above 85% since 2001, sustained over 90% since the 2009 cohort.

Laboratory capacity has been strengthened in the country. National reference laboratory for culture and DST have been established at the Central TB Institute in Pyongyang with support from Stanford University and Christian Friends of Korea. In 2011 and 2012, EQA was carried out in the NRL with
acceptable results for culture and DST. It was also carried out in all smear microscopy laboratories and 78% showed acceptable results.

Currently, MDR-TB is estimated to be 2.1% among new cases and 16% among retreatment cases based on WHO modelling. A small-size rapid study undertaken in 2010–2011 showed high levels of drug resistance. A preliminary survey is proposed to identify MDR-TB proportion among patients failing Category I and II regimens in Pyongyang in 2013, using one of the expected Xpert MTB/RIF machines. Representative drug resistance survey is planned to be conducted in 2014, following the improved capacity of the national TB reference laboratory in culture and drug susceptibility testing. Guidelines for MDR-TB management were developed in October 2011, NTP adopted standard regimen recommended by WHO and second line drugs are being procured through GDF with Global Fund support. By mid-2012, 48 MDR-TB cases confirmed by Hong Kong Supranational TB Laboratory were initiated on treatment with second line anti-TB drugs by the National TB Programme.

No HIV has been reported among the country population till date. However, surveillance is being maintained and HIV testing undertaken in select TB cases with history of travel.

Training materials on paediatric TB treatment were developed and training conducted. Orientation meetings on childhood TB with children-related facilities at central and provincial levels were held to improve TB service in 2012. TB case notification by age groups 0-4 and 5-14 years has been initiated since 2010.

A multi-year strategic plan for 2008–2015 was developed in line with the global plan to stop TB and the Regional Plan for TB Control, 2006–2015. The strategic plan is being updated in consultation with the Regional Office. The government provides for around one fourth of the funding requirements of the programmes in terms of staffing, infrastructure, drugs and surveillance. WHO continues to provide support to the programme, in terms of technical assistance, training health staff, strengthening laboratory services, upgrading infrastructure, and monitoring and evaluation. Regular supplies of anti-TB drugs were ensured through the GDF grant mechanism from 2003 and the last grant was extended until 2009. The WHO Regional Office exceptionally
secured funds to provide up to 90% of funding for a further one year supply of drugs to cover the needs in 2010. Currently, anti-TB drugs are being procured through the Global Fund Round 8 TB grant of which UNICEF, DPR Korea is the principal recipient. GDF is also providing grant of paediatric anti-TB drugs and adult drugs for one province not covered by the Global Fund grant. Support for SLD is also received through Global Fund and the Eugene Bell Foundation.

**Major achievements**

- DOTS firmly in place with service delivery extending to the most peripheral level;
- national TB reference laboratory for culture and DST functional;
- high case-detection and treatment success rates sustained;
- monitoring and evaluation and supervision of DOTS implementation strengthened;
- health facilities in other sectors involved;
- involvement of household doctors in TB programme institutionalized;
- GF-supported project being implemented satisfactorily;
- regular supplies of anti-TB drugs ensured through Global Fund and GDF;
- logistic management system for drug supply and management strengthened;
- national TB guidelines updated in line with WHO recommendation;
- PMDT initiated and will be rolled out in phased manner;
- two MDR-TB sites refurbished for ensuring infection control;
- establishment of a regional TB laboratory for culture and DST initiated;
- human resource capacity strengthened through regular training (programme management, laboratory work and EQA, ACSM, supply management, data management).
Major challenges and constraints

- sustaining funding for meeting financial gaps in implementing national programme;
- inadequate laboratory capacity for undertaking laboratory quality assurance;
- diagnosis and management of childhood TB;
- lack of information on drug resistance pattern in the country;
- lack of experience in implementing PMDT (e.g. programme management, management of MDR-TB patients, management of SLD, TB IC, R&R, etc.);
- non-availability of computerized data management not available upto country level.

Activities planned for 2013

- strengthening partnership with donor agencies for expansion of resource pool;
- strengthening coordination with other sectors;
- undertaking systematic supportive supervision at all levels;
- expanding microscopy centres for universal access to TB diagnosis;
- printing and dissemination of the revised national TB guidelines and laboratory manual;
- expanding programmatic management of DR-TB for better geographical coverage;
- refurbishing nine sanatoria for MDR-TB treatment site;
- introducing first Xpert machine in the national TB reference laboratory;
- providing technical support to national TB reference lab for early accreditation;
- providing training on approaches to ACSM at all levels.
<table>
<thead>
<tr>
<th>Estimates and notification rates for 2011, Democratic People’s Republic of Korea</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population</strong>*</td>
</tr>
<tr>
<td><strong>Incidence of all forms of TB</strong></td>
</tr>
<tr>
<td><strong>Incidence rate of all forms of TB (per 100 000 population per year)</strong></td>
</tr>
<tr>
<td><strong>Prevalence of all forms of TB</strong></td>
</tr>
<tr>
<td>(31 000 -220 000)</td>
</tr>
<tr>
<td><strong>Prevalence rate of all forms of TB (per 100 000 population per year)</strong></td>
</tr>
<tr>
<td><strong>TB death rate (of all forms of TB, excluding HIV per 100 000 population per year)</strong></td>
</tr>
<tr>
<td><strong>Notification rate of all forms of TB (per 100 000 population for the year 2011)</strong></td>
</tr>
<tr>
<td><strong>Notification rate of new smear-positive cases (per 100 000 population for the year 2011)</strong></td>
</tr>
<tr>
<td><strong>Case-detection rate (all forms of TB)</strong></td>
</tr>
<tr>
<td><strong>Treatment success rate (%) of new smear-positive cases for 2010 cohort</strong></td>
</tr>
</tbody>
</table>

India

With a population of about 1.25 billion, India is the largest country in the Region. It is ranking first among the high burden countries and contributed one-fourth of estimated global incident TB cases in 2011.

As per WHO estimates, prevalence and incidence rates of all forms of tuberculosis were respectively 249 and 181 per 100,000 population in 2011; however, current WHO estimates for TB incidence, prevalence and mortality have not yet been officially approved by the Ministry of Health and Family Welfare, Government of India and should, therefore, be considered provisional. The country initiated the process of computing national estimates for disease burden and two rounds of consultations were held with national and international experts in 2011 and 2012. The notification rate of all forms of TB and new smear-positive cases were respectively 106 and 51 in 2011.

Since its inception in 1997, the Revised National TB Control Programme (RNTCP) has initiated almost 17 million patients on treatment. Since 2005, the programme has consistently achieved and exceeded the global target of 85% treatment success rate among new smear-positive cases, with 88% for the cohort of patients registered in 2010, slightly below the newly set target of 90% success rate.

By the end of 2012, a total of 45 laboratories were accredited by the Government of India’s (GoI) RNTCP to undertake quality assured culture and drug susceptibility testing for first-line drugs for the programme; they
all demonstrated acceptable performance during EQA. In addition, 34 laboratories implemented line probe assay for diagnosis of MDR-TB cases. In 2012, rapid DST through Xpert MTB/RIF was introduced in 18 sites for field demonstration to guide rapid scale-up and in another 12 sites for decentralization of DST in MDR TB suspects. Of the smear microscopy laboratories in the country, 7% were in the private sector and laboratories where EQA was carried out demonstrated acceptable performance.

MDR-TB prevalence is estimated to be low (2.1% among new cases and 15% among retreatment cases) based on sub-national DRS surveys conducted in three states between 2006 and 2009; national DRS is planned for 2013. Despite the low MDR-TB prevalence, India ranks first among the 27 MDR-TB high burden countries worldwide after China, due to size of population and number of TB cases reported annually, contributing to 21% of all MDR-TB case estimated among notified cases. The RNTCP has developed a plan to scale-up MDR-TB services considerably in order to treat at least 40 000 MDR-TB patients annually by 2017, supported by Global Fund Round Single Stream Funding, UNITAID and domestic funds to enable a rapid expansion of MDR-TB services in the next few years. As on September 2012, all 35 states are providing MDR-TB diagnostic and treatment services; a cumulative total of 108 792 MDR-TB suspects were tested and 16 825 MDR-TB cases and 92 XDR-TB cases started on second-line standard treatment.

It is estimated that around 2.4 million Indians are currently living with HIV. Recent country level data show that about 6% of TB patients are HIV-positive. National surveillance has shown that the distribution of HIV among TB patients is highly heterogeneous, and is closely correlated with the distribution of HIV infection. Implementation of the revised national framework of joint TB–HIV collaborative activities began in early 2008 and interventions now cover the entire country. An intensified TB–HIV package has been rolled out and expanded to all 35 states of India. Intensified TB case-finding was implemented nationwide at all 5223 HIV testing centres known as integrated counselling and testing centres (ICTCs). During 2011, in just the seven highest-HIV burden states implementing the intensified TB-HIV package, 691 659 TB suspects were referred from ICTCs and ART Centres to RNTCP and 83 887 of them were diagnosed as having TB. By 2012, all states were implementing the intensified TB–HIV package.
In 2011 and in the first two quarters of 2012, 436,913 and 284,004 TB suspects, respectively, were referred from ICTCs to RNTCP, and of them 37,490 (8.6%) and 25,412 (8.9%), respectively, were diagnosed as having TB. In 2011 and in the first two quarters of 2012, 557,210 and 412,335 TB patients, respectively, were tested for HIV and of them 43,815 (7.9%) and 22,970 (5.6%) respectively, were diagnosed as HIV-positive and offered access to HIV care.

From 2010 to 2011, the percentage of TB patients tested for HIV increased nationally from 32% to 45%. In 2011, 91% of TB patients tested positive for HIV were offered access to cotrimoxazole preventive therapy (CPT) that has been included in national policies; access to ART is more challenging with 58% of co-infected patients started on treatment (10% more than in 2010).

In April 2010, RNTCP finalized the guidelines for airborne infection control in health care facilities (provisional version). Since then, the guidelines are being pilot tested in 35 health care facilities in three states ranging from high-end tertiary care facilities to primary health centres and will be finalized after the pilot concludes by mid-2013.

In 2008, the revised guidelines and schemes to operationalize RNTCP activities with NGOs and private sectors were implemented. The RNTCP training material specifically designed for private practitioners was revised and updated. Utilizing support received under the Global Fund’s Rolling Continuation Channel (RCC), RNTCP further expanded its collaborative public-private mix (PPM) TB activities. The PPM project with the Indian Medical Association (IMA) was expanded from six states to 16, and that with the Catholic Bishops’ Conference of India (CBCI) from 11 to 19 states across the country. The RNTCP is progressively involving an ever greater number of care providers with success. In 2011, RNTCP has involved over 1971 NGOs and 10,894 private practitioners; 150 corporate hospitals and 297 medical colleges are implementing RNTCP. The programme has successful partnerships with the Indian Medical Association (IMA), CBCI, PATH, The Union and World Vision India. In all, 14,000 patients were reported by 14 PPM surveillance sites in 2011.

Health services are administered in a decentralized manner at the level of the states and union territories through diverse public and private sector facilities. Policies for TB control activities are formulated at the central level
in consultation with other stakeholders, with the Central TB Division in the Ministry of Health and Family Welfare having overall responsibility for RNTCP. RNTCP plan and budgets are aligned with the national health plan. The National Rural Health Mission provides an opportunity for strengthening TB service delivery at the grass-roots level. A focal point for HRD has been designated at the central level. The EPI centre software has been successfully transitioned to a Windows-based system. The three-yearly joint GoI/WHO monitoring mission of RNTCP was successfully conducted in August 2012.

The programme was supported by World Bank, DFID, the Global Fund, USAID, UNITAID and other partners during the period 2007-12 and has since transitioned to increased budgetary support from domestic resources with a domestic contribution of about 80% during the period 2012-15. The Global Fund, UNITAID, WHO, USAID and other technical partners continue to support the programme.

**Major achievements**

- since its inception, nearly about 15 million patients initiated on treatment, thus saving more than 2.5 million additional lives;
- since 2007, RNTCP achieved the NSP case detection rate of more than 70% in line with the global targets for TB control while maintaining the treatment success rate of >85%);
- decentralized diagnosis through a network of more than 13,000 quality assured sputum microscopy laboratories;
- to ensure quality of sputum microscopy, external quality assurance being routinely conducted throughout the country as per a standardized protocol based on international guidelines (on site evaluation, panel testing and blinded crosschecking);
- treatment services decentralized through a network of more than 640,000 DOT centres/providers using patient-wise boxes both for adults and paediatric patients;
- increasing engagement of the new cadre of community-based accredited social and health activists (ASHAs);
• successful involvement of 297 medical colleges, 1971 NGOs, 10,894 private practitioners and over 150 corporate sector health units;
• revised RNTCP guidelines and schemes for involvement of NGOs and private providers in implementation of activities;
• basic national framework for TB–HIV collaborative activities implemented nation-wide, with “intensified TB–HIV package” implemented in all 35 states;
• forty-five laboratories accredited for TB culture and drug susceptibility testing; another 10 currently in the process undergoing accreditation;
• treatment for MDR-TB patients introduced in all 35 states, with a cumulative total of 109,842 suspects being tested for MDR-TB and 16,820 MDR-TB patients and 92 XDR-TB patients initiated on treatment up to September 2012;
• national Strategic Plan for the 12th Five-Year Plan 2012–2017 developed with universal access to TB care as its goal; budgetary outlay increased to more than three times compared to the previous five year plan;
• domestic contribution now at 84% showing the excellent political commitment for TB control by the country;
• major policy decisions in 2012 which could galvanize universal coverage include ban on commercial serology for TB diagnosis and making TB a mandatorily notifiable disease;
• a case-based web-based notification system (NIKSHAY) developed;
• standards of TB care in India being developed, which could trigger important advancement in early case detection and effective treatment for all TB patients;
• under the Global Fund Round 9 project, civil society organizations undertaking activities in 374 districts across 23 states to enhance the visibility and reach of the programme, and engage with communities and community-based care providers to improve TB care and control;
A number of meetings, workshops and training courses held during 2011 and 2012 including:

- The ninth and tenth National Task Force meetings and 10 Zonal Task Force workshops for the involvement of medical colleges in RNTCP;
- A preliminary workshop for discussions on the results of the ARTI and the prevalence surveys in April 2011, in order to arrive at estimates of TB prevalence and incidence;
- Workshop on TB disease burden estimation for India organized by the Central TB Division in July 2011;
- Meetings of the National Technical Working Group on HIV/TB collaborative activities, National Laboratory Committee, National DOTS Plus Committee, National Coordination Committee for reviewing Global Fund Round 9 projects in Tuberculosis in India, National Laboratory Committee, National Standing Committee for Operational Research in RNTCP, and National PMDT Committee;
- ‘TB Epidemiology Course’ and ‘Leadership and Management Course’ for STOs, Deputy STOs, DTOs, STDC Director, RNTCP Consultants;
- Biannual national review meetings of state tuberculosis officers and RNTCP consultants in 2011: the first had the theme of ‘National scale up of DOTS plus (PMDT) services under RNTCP in India’ and aimed to review the performance and quality of RNTCP services and the progress and challenges in the expansion of PMDT services, and to update the STOs and Consultants on newer initiatives, policy changes etc.; the second had the theme ‘Quality services for universal access under RNTCP’ and aimed to review the performance, prepare focused action plan for underperforming areas, update the STOs and Consultants; in 2012 the meeting aimed to review the performance and guide states in implementation of newer initiatives (ban on TB serology, notification of TB from private
sector and recording entries in case based web based patient tracking system).

- National Technical WG on PPM constituted and its first meeting held in 2012 to guide and advise the programme on involvement of other sectors;

- Meeting of National Task Force for involvement of corporate hospitals and Diplomate National Board institutions held in 2012;

- Meeting for involvement of non-health ministries, public sector undertakings in RNTCP held in 2012;

- Training of trainers in intensified TB–HIV package for the four union territories of Puducherry, Andaman & Nicobar Islands, Dadar and Nagar Haveli and Daman and Diu in 2011;

- National stakeholders’ meeting for tuberculosis and diabetes mellitus collaborative activities in 2011 attended by RNTCP and noncommunicable disease control programme officers; follow up meeting held in 2012;

- National consultative workshop for development of standards for TB care in India held in 2012;

- National and regional ACSM workshops for strengthening ACSM activities in the programme involving all the state TB officers, state IEC officers, state RNTCP consultants and other stakeholders;

- An ‘Intermediate Reference Laboratories Experience Sharing Workshop’ in 2011 for state TB officers, microbiologists and RNTCP consultants;

- Meeting of HRD Technical Working Group to finalize protocol for study on the human resource aspect for health and TB management integration.

- during 2012, monthly central internal evaluation of the programme performance and implementation status of RNTCP conducted in two districts in a state on a one-to-one basis along with review of their activity plans;
joint donor review mission conducted in June 2011 coordinated by the Central TB Division (CTD) of the MOHFW and the World Bank; Joint monitoring mission led by WHO and GoI conducted in August 2012; Both missions included also the following development partners: the Global Fund, DFID, USAID, the Bill and Melinda Gates Foundation and the Clinton Foundation. The major objective of the review missions was to provide feedback on the “National Strategic Plan for TB Control in India, 2012–2017”, with a focus on the important challenges to achieve the new more ambitious RNTCP objectives and to followup on findings and recommendations of previous missions.

a high-level meeting on drug-resistant tuberculosis held at Vigyan Bhawan under the aegis of the Minister of Health and Family Welfare, in August 2012 with participation of renowned national and international experts;

the status of services for PMDT and its scale reviewed twice through a series of eight review meetings held at the regional level in 2012.

**Major challenges**

- ineffective and delayed diagnosis of TB in both the private and public sectors; patients accessing private providers not linked or engaged with RNTCP;
- failure to notify and register patients in the private sector diagnosed with TB;
- achieving universal access including marginalized and high-risk groups, while maintaining and continuing to improve the quality of services across the country;
- introducing newer diagnostics for TB control and their positioning at various levels of health care;
- ensuring adequate staffing at all levels, through improved human resource development, to reduce reliance on a limited pool of TB-dedicated staff;
- alleviating weaknesses in supervision capacity and quality, as well as in planning, monitoring and evaluation;
enforcement of regulations for prescription and sale of anti-TB drugs; promoting rational use of first- and second-line anti-TB drugs outside the programme to prevent MDR and XDR TB;

developing and implementing airborne infection control measures in health facilities;

effectively promoting operational research to address local challenges.

Planned activities in 2013

- maintaining and further improving both quality and reach of services to move towards achieving universal access;
- major initiatives for urban TB control models;
- innovative private sector engagement initiatives including social franchising;
- revisiting the laboratory scale-up plan to further expand the network of quality assured laboratories, strengthening capacity of the four national reference laboratories and the experienced state-level intermediate reference laboratories to undertake second-line DST, and establish two additional national reference laboratories;
- complete geographical coverage for diagnostic and treatment services for MDR-TB cases to all states by March 2013;
- deployment of 40 additional Xpert MTB/RIF machines to address laboratory capacity deficits in hard to reach areas for decentralized DST;
- introducing and disseminating the “Standards for TB Care in India”;
- deploying revised schemes for involvement of NGOs and private practitioners across the country;
- phased scale-up of the implementation of the intensified TB–HIV package and introduction of IPT in HIV-infected cases after ruling out active TB;
- piloting the “Practical Approach to Lung Health” initiative in Kerala;
• finalize RNTCP guidelines for airborne infection control in health care facilities and handing it over for integration with the general health system (Indian public health standards, MCI, NCDC, NRHM and IDSP);

• developing revised technical and operational guidelines for early case detection including revision of diagnostic algorithm, contact tracing, active case-finding etc.

• conducting a workshop for dissemination of the results of the ongoing RNTCP epidemiological impact assessments;

• evaluating the effect of the revised diagnostic algorithm, suspect and case definitions on case notifications;

• developing and testing ICT for notification and drug management;

• scaling up nation-wide implementation of NIKSHAY, a case-based web-based patient tracking and data management system for all forms of TB; and

• introducing strategies for universal access to free treatment for all TB patients diagnosed and managed in public and private sectors across the country in collaboration with drug manufacturers and pharmacist associations.
Case notifications by type of patients, 2011

- **New smear-positive**: 42.4%
- **New smear-negative**: 22.4%
- **New extrapulmonary**: 15.0%
- **Other new cases**: 0.1%
- **Relapse**: 7.4%
- **Treatment after failure**: 1.1%
- **Treatment after default**: 4.8%
- **Other retreatment**: 6.7%
- **Other new cases**: 0.1%
- **Other**: 12.7%

Trends in notified new smear-positive TB cases by age group among males, 2001–2011

- **0-14 years**
- **15-24 years**
- **25-34 years**
- **35-44 years**
- **45-54 years**
- **55-64 years**
- **65+ years**

Trends in notified new smear-positive TB cases by age group among females, 2001–2011

- **0-14 years**
- **15-24 years**
- **25-34 years**
- **35-44 years**
- **45-54 years**
- **55-64 years**
- **65+ years**

Treatment outcomes of new smear-positive cases, 2010 cohort

- **Cured**: 85.1%
- **Completed**: 2.6%
- **Died**: 4.2%
- **Failed**: 1.9%
- **Defaulted**: 5.5%
- **Non-evaluated**: 0.8%

Trends in treatment outcomes of new smear-positive cases, 2000–2010

- **Success rate**
- **Died**
- **Failed**
- **Defaulted**
- **Not evaluated**
## Estimates and notification rates for 2011, India

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>1 250 232 069</td>
</tr>
<tr>
<td>Incidence of all forms of TB</td>
<td>2 200 000</td>
</tr>
<tr>
<td>(2 000 000-2 500 000)</td>
<td>345 (296-397)</td>
</tr>
<tr>
<td>Incidence rate of all forms of TB (per 100 000 population per year)</td>
<td>181 (163-199)</td>
</tr>
<tr>
<td>Prevalence of all forms of TB</td>
<td>3 100 000</td>
</tr>
<tr>
<td>(2 100 000-4 300 000)</td>
<td>422 (126-892)</td>
</tr>
<tr>
<td>Prevalence rate of all forms of TB (per 100 000 population per year)</td>
<td>249 (168-346)</td>
</tr>
<tr>
<td>TB death rate (of all forms of TB, excluding HIV per 100 000 population per year)</td>
<td>24 (15-35)</td>
</tr>
<tr>
<td>Notification rate of all forms of TB (per 100 000 population for the year 2011)</td>
<td>106</td>
</tr>
<tr>
<td>Notification rate of new smear-positive cases (per 100 000 population for the year 2011)</td>
<td>51</td>
</tr>
<tr>
<td>Case-detection rate (all forms of TB)</td>
<td>59 (54-65)</td>
</tr>
<tr>
<td>Treatment success rate (%) of new smear-positive cases for 2010 cohort</td>
<td>88</td>
</tr>
</tbody>
</table>

Note: Estimated incidence, prevalence and mortality rates and numbers should be considered provisional, as they have not yet been officially approved by Ministry of Health and Family Welfare - Government of India

Indonesia

With a population of about 245 million, Indonesia carries the fourth highest TB burden globally. The estimated prevalence and incidence rates of all forms of tuberculosis were respectively 281 and 187 per 100 000 population, in 2011. Tuberculin surveys and mortality studies were conducted successfully during 2006–2008 and data indicate that TB prevalence in Indonesia continues to decrease. Indonesia is planning to implement a nationwide TB prevalence survey in 2013 to improve TB burden estimates and trends assessment. The notification rate of all forms of TB and new smear-positive cases were respectively 131 and 81, confirming a slight but steady increase since 2006. Treatment success rate among new smear-positive cases was consistently above the target of 85% in the last decade and reached the newly set target of 90% already in 2004; for the cohort of patients registered in 2010, the success rate was 90%.

Rapid expansion of DOTS over the last decade led to significant improvement in case detection and treatment success. The NTP implemented the second strategic plan for 2006–2010, built on a solid DOTS foundation in the public sector and aimed to strengthen the quality of service delivery and increase the participation of hospitals in both the public and private sectors. The leading theme for the new TB Control National Strategy 2010–2014 is “Breakthrough toward Universal Access”. Strategies such as, hospital–DOTS linkages, MDR-TB management, improvement of laboratory network and strengthening of a quality assurance system, and HIV collaborative activities are currently being scaled up.
Notification of sputum smear-positive cases increased by about 20% in the last five years, as well as extrapulmonary cases that increased by about 40%; on the other hand, the number of sputum smear-negative cases is rather stable over the last few years. The result of increased notification by hospitals and clinics to be likely linked to the national TB programme. The TB programme is scaling up public–public and public–private partnerships. In 2012, 8882 NTP providers, 865 non-NTP public providers and 488 private providers were engaged in the programme and actively collaborated with NTP. The non-NTP public providers included 165 prisons and 180 military/police hospitals. The overall yield of new TB cases diagnosed and notified according to NTP guidelines was 71 454 in 2011.

Teaching of the principles and practices of DOTS have been integrated into the medical school curriculum at 42 schools of medicine.

The ISTC has been endorsed by the professional associations and is currently being widely disseminated among members of professional organizations.

ACSM activities are being scaled up in different provinces of the country.

The number of retreatment cases is steadily around 2%, suggesting that the overall rate of TB drug resistance is still relatively low. However, these data are mainly from DOTS centres; data from the private and non-NTP public sectors are not yet captured by the NTP. There are no nationwide representative data on the prevalence of MDR-TB. Subnational drug resistance surveys (DRS) have been conducted in Mimika District (2004), showing 2% MDR-TB cases among newly diagnosed TB cases, and in Central Java province (2006) showing MDR rate of 1.8% among the new cases and 16.7% among re-treatment cases. Another DRS survey is ongoing for East Java (entering the final analysis phase, results not available yet) and drug resistance sentinel surveillance was implemented at four provinces in 2012 and will be expanded gradually, following the country PMDT expansion. The sentinel DRS is aiming at providing data geographically representative of the whole country.

Even if MDR-TB prevalence is considered to be low, Indonesia is one of the 27 MDR-TB high burden countries worldwide due to the size of the population and number of TB cases reported annually. GLC approval for the management of MDR-TB cases was obtained in 2008. In 2009, national PMDT and treatment
guidelines were developed and MDR-TB diagnostic and treatment services commenced at two sites (Jakarta at the Persahabatan hospital and in Surabaya city). By the end of September 2012, there were totally nine PMDT referral centres and 120 treatment centres across the country, where 943 MDR-TB cases were detected and 703 registered for treatment cumulatively.

It is estimated that the prevalence of HIV among the adult population is 0.16% nationally, and there are about 190 000 people living with HIV in the country. While HIV is characterized as a concentrated epidemic in Indonesia, it is at the stage of a generalized epidemic in Papua province, with an HIV prevalence of 2.4% in the general population. The estimated number of people coinfected with TB–HIV is 15 000 (ranging between 11 000 and 20 000). The estimated prevalence of HIV among incident TB cases is 2.8% nationally. In some provinces, the TB–HIV co-infection rate is reported to be much higher, e.g. in Papua (14%) and Bali (3.9%). The national policy for TB–HIV collaboration activities is in place and guidelines and training materials developed. NTP has revised the recording and reporting system, to include information on TB–HIV. Twelve provinces were identified as priority areas for TB–HIV interventions in 2010. Collaborative activities were implemented in 12 of these provinces. By the end of 2012, a total of 165 hospitals were involved in the delivery of ART, VCT and DOTS services, while another 31 hospitals and 159 PHCs were involved in VCT and DOTS in all 33 provinces. Facilities for CD4 counts are available totally in 160 health facilities across the country.

Efforts to expand and strengthen the national laboratory network were ongoing, with assistance from the supra-national reference laboratory in Adelaide, Australia.

In 2012, there were 46 culture laboratories, of which five carried out EQA for DST with acceptable performance both for first line and second line. In two laboratories, Line Probe Assay (LPA) was in use and Gene Xpert was implemented in five sites.

A comprehensive HRD plan was in place and a focal point for HR had been designated at the central and provincial levels. Drug management was showing good progress; there was generally a good supply of first and second line drugs at all levels. From 2010, all FLD procurement had been covered by the national budget. No drugs stock-out was reported in the last two years. NTP’s plan and budget were aligned with the national health sector development plan. However, in the past, there were challenges due to the
decentralization of health services down to the level of each district in the country. In 2011, NTP formulated a policy known as “exit strategy”, preparing local budget to anticipate the external funding reduction by mobilizing funds at the sub-national level for programme operational costs and funds from the universal health coverage insurance scheme for patients costs.

The Indonesian programme received support from several sources including the Global Fund (rounds 8, 10 and single stream funding) and USAID through TB CARE I. Technical assistance is being provided by WHO, KNCV, Management Sciences for Health (MSH), FHI360, JATA, ATS, Union and IMVS.

**Major achievements**

- TB control included in the National Development Plan 2010–2014 with secure budget lines;
- TB was the priority in the Strategic Plan of MoH;
- hospital DOTS expansion covered 40% of the public and private hospitals;
- new hospital accreditation system addressing quality DOTS strategy as a part of requirement;
- the engagement of private practitioners implemented with close collaboration from the Indonesian Medical Association;
- national guidelines for TB control programme implementation in military health facilities, workplace and prisons reviewed and updated.
- TB–HIV interventions included in Ministerial Decree in December 2009, and national guidelines;
- microscopic reference laboratories available in all 33 provinces (including in seven newly established provinces);
PMDT expansion from two referral centres in 2009 to nine referral centres in 2012. More than 120 treatment centres/satellites established to support patients’ decentralization;

- five laboratories quality assured for culture and DST of FLD and SLD and linkage with supranational reference laboratory established;
- four more laboratories under certification process;
- DRS completed in Central Java and in data analysis stage for East Java;
- DRS plan implemented in four provinces for sentinel sites according to PMDT expansion plan and aimed for geographical representativeness of parts of the country;
- TB–HIV collaborative activities covered 12 high HIV prevalence provinces.

**Major challenges**

- commitment and contribution of local governments to TB control;
- existing gaps of case-notification due to underreporting cases from hospitals and other private providers;
- unreached population in remote areas (eastern part of the country, particularly), migrants in big cities, in prisons, and high risk populations to HIV;
- expanding quality DOTS in hospitals, both government (MoH and other ministries) and private, including private practitioners;
- rapid expansion of PMDT and maintaining high quality;
- expansion of laboratory networks for culture and DST in islands other than Java and EQA;
- introduction of new diagnostics (LPA, Xpert MTB/RIF) and integration into the system;
- expansion of TB–HIV collaborative activities to cover more provinces;
- maintaining the capacity of TB-related staff amidst high turnover rate;
- weak drug regulation and preventing the problem of stock-out of FLD/SLD.
Activities planned for 2013

- advocating to increase commitment and contribution from local governments to support TB control;
- MoH to strengthen HRD on TB and standardize the training curricula and materials;
- engaging health insurance and universal health coverage scheme;
- supporting comprehensive approach to increase performance of DOTS in low performance areas (unreached, underserved populations);
- supporting quality DOTS expansion in hospitals of government and private practitioners through standarization and accreditation system;
- supporting PMDT expansion to establish 27 PMDT referral centers at 26 provinces;
- supporting DRS plan expansion to six provinces’ planning and preparation;
- supporting national TB prevalence survey to measure the impact of TB control in Indonesia;
- supporting laboratory network expansion and EQA for DST and microscopy;
- facilitating EXPAND-TB collaboration with NTP and introduction/integration of new diagnostics into the system;
- facilitating the implementation of the new PPM approach which matches with the country need and situation (branding, mandatory notification, social bussiness model, etc);
- supporting expansion of TB–HIV collaborative activities to another 13 provinces;
- supporting initiation of TB and diabetes collaborative activities (recommendation from GF R 10);
- supporting capacity strengthening of TB staff on DOTS, PMDT, TB–HIV and other key areas;
- collaborating with all partners to prevent problem of drug and commodity stock-out.
Tuberculosis Control in the South-East Asia Region 2013

Case notifications by type of patients, 2011

- New smear-positive: 61.6%
- New smear-negative: 31.7%
- New extrapulmonary: 4.4%
- Relapse: 1.7%
- Treatment after failure: 0.3%
- Treatment after default: 0.3%
- Other: 0.7%
- Other retreatment: 0.3%
- Other: 0.7%
- Relapse: 1.7%

Trends in notified new smear-positive TB cases by age group among males, 2001–2011

- 0-14 years
- 15-24 years
- 25-34 years
- 35-44 years
- 45-54 years
- 55-64 years
- 65+ years

Trends in notified new smear-positive TB cases by age group among females, 2001–2011

- 0-14 years
- 15-24 years
- 25-34 years
- 35-44 years
- 45-54 years
- 55-64 years
- 65+ years

Treatment outcomes of new smear-positive cases, 2010 cohort

- Cured: 83.7%
- Completed: 6.6%
- Died: 2.2%
- Failed: 0.6%
- Defaulted: 4.0%
- Non-evaluated: 2.9%

Trends in treatment outcomes of new smear-positive cases, 2000–2010

- Success rate
- Died
- Failed
- Defaulted
- Not evaluated
### Estimates and notification rates for 2011, Indonesia

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population*</td>
<td>244 191 166</td>
</tr>
<tr>
<td>Incidence of all forms of TB</td>
<td>450 000</td>
</tr>
<tr>
<td>(370 000-540 000)</td>
<td></td>
</tr>
<tr>
<td>Incidence rate of all forms of TB (per 100 000 population per year)</td>
<td>187 (155-222)</td>
</tr>
<tr>
<td>Prevalence of all forms of TB</td>
<td>680 000</td>
</tr>
<tr>
<td>(310 000 -1 200 000)</td>
<td></td>
</tr>
<tr>
<td>Prevalence rate of all forms of TB (per 100 000 population per year)</td>
<td>281 (130-489)</td>
</tr>
<tr>
<td>TB death rate (of all forms of TB, excluding HIV per 100 000 population per year)</td>
<td>27 (12-48)</td>
</tr>
<tr>
<td>Notification rate of all forms of TB (per 100 000 population for the year 2011)</td>
<td>131</td>
</tr>
<tr>
<td>Notification rate of new smear-positive cases (per 100 000 population for the year 2011)</td>
<td>81</td>
</tr>
<tr>
<td>Case-detection rate (all forms of TB)</td>
<td>70 (59-85)</td>
</tr>
<tr>
<td>Treatment success rate (%) of new smear-positive cases for 2010 cohort</td>
<td>90</td>
</tr>
</tbody>
</table>

Maldives

With a population of about 320,000, Maldives has an estimated prevalence and incidence rate of all forms of TB respectively of 44 and 36 per 100,000 population. The notification rate of all forms of TB and new smear-positive cases were respectively 27 and 15, showing steady decrease, particularly for all cases. Treatment success rate among new smear-positive cases was 82% for the cohort of patients registered in 2010. Treatment success rate is below the 85% target since 2007, mainly because of defaulters and non-evaluated cases; however, for the cohort of 2010 the success rate is mainly affected by the proportion of patients who died.

Since its establishment in 1976, the NTP at the Centre for Community Health and Disease Control, Ministry of Health, Maldives is the central body for registration, planning, monitoring, training and evaluation of TB control activities. TB is a notifiable disease and DOTS remain the core element of the national TB control programme. Close coordination and collaboration with other health care institutions, especially private health care institutions, in diagnosing and accurately reporting identified cases has been established. All anti-TB drugs are available only through the government-run national TB control programme.

The main objectives of the NTP are to effectively improve and strengthen TB prevention activities, in addition to diagnosis and treatment of TB cases. In this regard, establishment of critical infrastructure and human resource development for intensified case-finding, early case detection and
strengthening the microscopy network are critical; currently there are 40 smear microscopy laboratories and one culture facility. At the same time, social mobilization for increased community involvement and utilization of available services and strengthening NTP management have also been identified as key areas. In 2010, an IEC information package on transmission and prevention was developed and disseminated for school children, and a training workshop for community health workers on TB management and contact tracing conducted.

Available data suggest that TB is relatively uncommon in Maldives; HIV prevalence is estimated to be less than 0.1% in the adult population and TB–HIV is not a major problem yet. Screening of all HIV-positives cases for active TB is in place in collaboration with the HIV programme since 2003. HIV testing for all TB patients who are above 15 years of age was initiated during December 2011.

Drug susceptibility testing, if deemed clinically necessary for a particular patient, is undertaken by shipment of samples to the National Tuberculosis Institute (NTI), Bangalore, which is also the current designated supranational reference laboratory for the country. In 2011, four MDR-TB suspects were detected and they all tested negative for INH and RIF resistance; no cases were started on treatment. Patients diagnosed with MDR-TB are managed clinically at the tertiary care hospital, the Indira Gandhi Memorial Hospital in Malé, and treatment is based on individualized regimens. Second-line drugs for the management of these cases are procured by the Ministry of Health on a case-by-case basis.

The NTP is technically supported by WHO and benefits from an ongoing grant from the Global Drug Facility for first-line drugs.

**Major achievements up to end of 2012**

- 100% geographical coverage of DOTS;
- diagnosis and treatment policies in accordance with the WHO guidelines;
- external review of the national TB control programme conducted and the main areas where improvement is needed for the NTP identified;
a draft national strategic plan for the control of TB in Maldives developed;

- quality assured FLD through MoH funds and provided free of charge to patients;

- WHO-recommended treatment regimen being used to treat the TB patients;

- measures taken to control the emergence of MDR-TB;

- the national TB control programme runs in close collaboration with the national AIDS programme;

- national guideline on “Practical Approach to Lung Health” developed.

**Major challenges and constraints**

- strengthening and sustaining the laboratory EQA system;

- inadequate levels of collaboration between all care providers and the national TB control programme;

- lack of technical programme staff at the central level for effective programme implementation and monitoring.

**Planned activities in 2013**

- continuing postgraduate training in MD chest medicine / respiratory medicine;

- regional short-term fellowship on TB programme management;

- developing and disseminating IEC packages to all MDR-TB patients on treatment adherence;

- developing guidelines for infection control;

- strengthening national TB team and providing international training for two staff members of DOTS centres on DOTS;

- monitoring of provincial TB programmes;

- developing IEC packages for DOTS;

Case notifications by type of patients, 2011

- New smear-positive: 53.4%
- New smear-negative: 13.6%
- New extrapulmonary: 31.8%
- Treatment after failure: 1.1%

Notified smear-positive cases by age group and sex, 2011

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-14</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>15-24</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>25-34</td>
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<td>4</td>
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<tr>
<td>35-44</td>
<td>4</td>
<td>2</td>
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<tr>
<td>45-54</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>55-64</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>65+</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Treatment outcomes of new smear-positive cases, 2010 cohort

- Cured: 81.8%
- Died: 9.1%
- Non-evaluated: 6.8%
- Failed: 2.3%

Trends in TB case notifications, 2001–2011

- Cases per 100,000 population
  - All cases
  - New smear-positive

Notification rate of new smear-positive TB cases by age group and sex, 2011

- Male
- Female

Trends in treatment outcomes of new smear-positive cases, 2000–2010

- Treatment success rate (%)
  - Year: 2000-2010
  - Success rate
  - Died
  - Failed
  - Defaulted
  - Not evaluated
<p>| | |</p>
<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Population</strong>*</td>
<td>322 305</td>
</tr>
<tr>
<td><strong>Incidence of all forms of TB</strong></td>
<td>110 (93-120)</td>
</tr>
<tr>
<td><strong>Incidence rate of all forms of TB (per 100 000 population per year)</strong></td>
<td>36 (29-39)</td>
</tr>
<tr>
<td><strong>Prevalence of all forms of TB</strong></td>
<td>140 (56-260)</td>
</tr>
<tr>
<td><strong>Prevalence rate of all forms of TB (per 100 000 population per year)</strong></td>
<td>44 (18-83)</td>
</tr>
<tr>
<td><strong>TB death rate (of all forms of TB, excluding HIV per 100 000 population per year)</strong></td>
<td>2.5 (2.1-2.9)</td>
</tr>
<tr>
<td><strong>Notification rate of all forms of TB (per 100 000 population for the year 2011)</strong></td>
<td>27</td>
</tr>
<tr>
<td><strong>Notification rate of new smear-positive cases (per 100 000 population for the year 2011)</strong></td>
<td>15</td>
</tr>
<tr>
<td><strong>Case-detection rate (all forms of TB)</strong></td>
<td>81 (70-94)</td>
</tr>
<tr>
<td><strong>Treatment success rate (%) of new smear-positive cases for 2010 cohort</strong></td>
<td>82</td>
</tr>
</tbody>
</table>

Myanmar

Myanmar is among the 22 countries with the highest burdens of TB worldwide. TB control is a priority in the country’s national health plan. DOTS was introduced in 1997 and was expanded to the entire country by 2003; in 2006, the country endorsed the Stop TB Strategy and started implementation of a broader spectrum of activities.

According to WHO, based on the results of prevalence survey successfully conducted in 2009–2010, the estimated prevalence and incidence rates of all forms of tuberculosis were revised upwards to respectively 506 and 381 per 100,000 population (in 2011). Data showed that TB affected mainly the young adults, which is characteristic for significant on-going transmission. It also indicated, however, a downward trend of smear-positive symptomatic TB. The survey also provided important information about reasons for missing cases that are crucial to improve case finding strategies. Myanmar is planning to repeat the prevalence survey after 2015 to continue monitoring the trends of TB burden.

In 2011, the notification rates of all forms of TB and new smear-positive cases were respectively 294 and 87 per 100,000 population; since 2008, a slightly increasing trend for all TB cases and fairly stable trend for smear-positive cases is observed. Treatment success rate among new smear-positive cases was 85.5% for the cohort of patients registered in 2010.
The reference laboratories in Yangon and Mandalay perform externally quality-assured cultures and first-line DST (both conventional method and rapid test). Second-line DST is being undertaken at the SNRL in Bangkok. With support from EXPAND-TB, new TB diagnostic tools have been implemented in the two national reference laboratories, including liquid culture, first-line drug susceptibility testing, rapid immunoassay for species identification and line probe assay for rapid diagnosis of MDR-TB. With the upgraded laboratory capacity, MDR-TB diagnosis can be confirmed within three days compared to the earlier two to three months. Xpert MTB/RIF was also introduced in five sites. According to EQA carried out in 328 (out of 415) smear microscopy laboratories, 79% reported no major error.

The second nationwide drug resistance survey carried out in 2008 had shown an MDR-TB prevalence of 4.2% among new and 10% among previously treated cases; Myanmar is on the list of the 27 MDR-TB high burden countries worldwide. The third nationwide DRS survey was started in October 2012. Results are expected to be available by mid-2013. The Ministry of Health established an expert committee on drug-resistant TB comprising hospital specialists, NTP, WHO and NGOs, to oversee the national response. A GLC-approved pilot project for treatment of MDR-TB has completed enrolment. The first year cohort (n=122) shows a cure rate of 71%, which is very commendable, considering that only category 2 failures were included in the project. The NTP is now moving towards mainstreaming MDR-TB management as a routine programme component. In April 2011, the GLC approved the expansion of MDR-TB management to treat an additional 1800 patients financially supported by the Global Fund and Three Diseases Fund. An MDR-TB scale-up plan was developed for 2011–2015. This plan aimed to build capacity for diagnosis, treatment and care for 10 000 MDR-TB patients over five years, and all states and regions would have diagnostic capacity through rapid DST (by Xpert MTB/RIF) and MDR-TB treatment centres.

While the national prevalence of HIV infection is estimated at 0.53% of the adult population, the prevalence of HIV among TB patients was reported to be 9.9%, based on data from the 2011 HIV sentinel survey. TB–HIV collaborative

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The Three Diseases Fund (funding interventions for AIDS, TB and malaria) was established as a donor consortium by the European Commission and the Governments of Australia, Denmark, the Netherlands, Norway, Sweden and the United Kingdom and its life was extended till the end of 2012, after which the Three Millennium Development Goals Fund (3 MDG Fund) will continue.
activities are being implemented jointly by the NTP and the national AIDS programme in 18 sites and two more sites with the support of the Union. HIV screening for TB patients is presently available through 25 VCCT sites. ART was available for about 28 000 PLHIV by the end of 2010, provided by NAP and MSF; CPT was included in national guidelines. In 2011, 3% of all TB patients were tested for HIV and 20% of them were found positive. TB–HIV co-infected patients were all receiving CPT and 80% of them were receiving ART, mainly from the national AIDS programme with support from the Union and MSF.

A pilot project to provide IPT to PLHIV was conducted in nine townships and 361 PLHIV were reported being provided with IPT in 2011.

An update of the Five-Year Strategic Plan 2011-2015 was released. This update was developed in light of the prevalence survey results. This plan and budget were aligned with the national health sector development plan. An international review of NTP took place in November 2011 to assess the progress in implementing the Stop TB Strategy and in reaching the TB-related Millennium Development Goals.

In line with the Global Stop TB Strategy, NTP engaged private providers on a nationwide scale through partnerships with the Myanmar Medical Association and the Sun Quality Health network of PSI, which together accounted for 16% of TB notifications in 2011 nationally. The collaboration with private providers as well as other non-NTP providers such as NGOs and public hospitals are currently contributing close to 22% of all TB notifications (23% in 2011). The International Science and Technology Centre has been endorsed by specialists and the professional associations in the country. Data management software was implemented and central, regional and state staff trained in data management and its use.

NTP is being supported by increased funding from the government, supplemented significantly by funding from external sources such as USAID, UNITAID, WHO, JICA TBREACH and GDF.

The Global Fund Round 9 grant for TB control was signed in November 2010. A total of US$ 28.6 million was approved for Phase 1 (2011–2012) while up to US$ 48 million may be granted in Phase 2.
Major achievements

- The National Strategic Plan 2011–2015 was updated following the completion of the national prevalence survey and taking into account its results. It contains three important annexes on (i) active case-finding; (ii) TB–HIV, and (iii) MDR-TB.
- Phase 1 of Global Fund Round 9 was implemented during 2011–2012. A request for renewal was submitted. The Global Fund also invited CCM to submit concept notes for topping up this Phase 2.
- The Three Diseases Fund support for TB control efforts was available till the end of 2012 to ensure coverage of essential activities. Smooth transition to the 3 MDG Fund is envisaged with effective start planned for early 2013.
- Three TBREACH projects were implemented in 2012 by the Union, PSI and IOM.
- Upgradation and implementation of newer diagnostic tools in national reference laboratories in Yangon and Mandalay.
- The MDR-TB pilot projects in Yangon and Mandalay, implemented by the NTP and MSF-Holland were successfully completed. Based on the experiences of the pilot project, the NTP is putting MDR-TB management into scale.
- The involvement of private practitioners to fight TB is expanding continuously with support from Population Services International and the Myanmar Medical Association. Linking public hospitals to NTP has also continued. A total of 15 hospitals are now implementing PPM schemes.
- TB–HIV collaborative activities continued successfully and the need to scale up activities was acknowledged by all partners working on TB and HIV/AIDS control in the country.
- Guidelines on community involvement in TB prevention, care and control were developed with national and international partner organizations.
Major challenges

- The gap between the estimated TB burden and notified cases remains significant and will require new strategies to narrow. Especially the huge number of definite, rather chronic TB cases with less prominent symptoms are a challenge to address. Hard-to-reach areas, border areas and conflict areas also pose challenges for service delivery.

- In spite of significant additional resources committed for TB control by the government and external donors, the funding gap is still considerable. Consolidation of current activities and expansion of new approaches will require significant additional funding.

- Only 2% of MDR-TB cases are adequately diagnosed, treated and cared for.

- TB–HIV collaborative activities are only implemented in 20 out of the 330 townships in the country. It is estimated that 10% of TB patients are living with HIV/AIDS.

Activities planned for 2013

- implementing a major expansion of active case-finding, TB–HIV testing and MDR-TB management with additional committed funding;

- further decentralizing Xpert MTB/RIF to improve TB and MDR-TB diagnosis;

- launching new MDR-TB guidelines and scaling up MDR-TB diagnosis, treatment and care to additional geographical areas;

- completing the third nationwide drug resistance survey;

- expanding PPM to promote increased and earlier case detection;

- enhancing resource mobilization to capitalize on the renewed interest shown by several donor countries.
Case notifications by type of patients, 2011

- New smear-positive: 30%
- New smear-negative: 43%
- New extrapulmonary: 19%
- Relapse: 3%
- Treatment after failure: 1%
- Treatment after default: 0.4%
- Other: 5%
- Other retreatment: 3%
- Other retreatment: 3%
- Other: 5%

Trends in TB case notifications, 2001–2011

- Trends in notified new smear-positive TB cases by age group among males, 2001–2011

Trends in notified new smear-positive TB cases by age group among females, 2001–2011

Trends in treatment outcomes of new smear-positive cases, 2000–2010

- Cured: 77%
- Completed: 8%
- Died: 5%
- Failed: 3%
- Defaulted: 4%
- Non-evaluated: 2%
### Estimates and notification rates for 2011, Myanmar

<table>
<thead>
<tr>
<th>Metric</th>
<th>Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population*</td>
<td>48,668,785</td>
</tr>
<tr>
<td>Incidence of all forms of TB</td>
<td>180,000</td>
</tr>
<tr>
<td>(160,000-210,000)</td>
<td></td>
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<tr>
<td>Incidence rate of all forms of TB (per 100,000 population per year)</td>
<td>381 (326-439)</td>
</tr>
<tr>
<td>Prevalence of all forms of TB</td>
<td>240,000</td>
</tr>
<tr>
<td>(190,000-310,000)</td>
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<tr>
<td>Prevalence rate of all forms of TB (per 100,000 population per year)</td>
<td>506 (390-637)</td>
</tr>
<tr>
<td>TB death rate (of all forms of TB, excluding HIV per 100,000 population per year)</td>
<td>48 (22-84)</td>
</tr>
<tr>
<td>Notification rate of all forms of TB (per 100,000 population for the year 2011)</td>
<td>294</td>
</tr>
<tr>
<td>Notification rate of new smear-positive cases (per 100,000 population for the year 2011)</td>
<td>87</td>
</tr>
<tr>
<td>Case-detection rate (%) (all forms of TB)</td>
<td>77 (64-87)</td>
</tr>
<tr>
<td>Treatment success rate (%) of new smear-positive cases for 2010 cohort</td>
<td>85.5</td>
</tr>
</tbody>
</table>

*Source: Department of Health, Myanmar, 2011.*
Nepal

With a population of about 30 million, Nepal had an estimated incidence and prevalence of all forms of TB respectively of 163 and 243 per 100 000 population (in 2011). The notification rate of all forms of TB and new smear-positive cases were respectively 116 and 49, showing no significant change for the last few years, despite sustained high case-detection and treatment success rates, increased access to DOTS through decentralization of services, outreach projects and strong community involvement. In the last five years, there was a very slight shift to the older age groups that could indicate a possible decline in TB burden in Nepal in recent years. The national ARTI survey completed in 2007 was also indicative of a declining trend. However, according to evidence currently available, TB incidence is currently considered “frozen” at 163 per 100 000 population since 1990. To better understand the real burden of disease, age distribution and possible reasons for missing out TB cases, Nepal is planning to conduct a prevalence survey in 2013–2014, the results being expected by mid-2015.

Treatment success rate among new smear positive cases was 90% for the cohort of patients registered in 2010, and is consistently above the target of 85% since 2001. Six months’ treatment regimen has been introduced throughout the country.

Tuberculosis control is identified as a top priority programme within the Ministry of Health and Population; NTP can count on several fully dedicated staff at central, regional and district levels. In addition, a Programme
Management Unit was set up in 2009 to help with planning, implementation and monitoring of activities supported by the Global Fund.

According to results from DRS conducted in 2007, MDR-TB prevalence is rather low (2.9% and 11.7% among new and retreatment cases respectively) but not negligible. Preliminary (unpublished) results of a more recent DRS carried out by GENETUP lab (NGO-run laboratory in public private partnership with NTP), in 2011 showed a very slight decline of MDR-TB prevalence among new cases (2.6%) but a rather sharp increase (17.6%) in re-treatment cases. The findings, however, may not reflect real changes due to the wide confidence intervals, overlapping those of the previous DRS. Culture and DST (for first and second line drugs) facilities are provided by two quality assured laboratories: the national reference laboratories that has been recently upgraded and the GENETUP lab, both supported by the SNRL at Gauting, Germany. Results of patients’ DST are collected but not regularly reported and analysed. Quality assurance activities for smear microscopy are regularly carried out in all Regions; in 2011, results were available for four of the five Regions and showed concordance of 95% and above.

Nepal was one of the first countries globally to introduce ambulatory MDR-TB case management in 2005 diagnosing and treating Category II failures and other laboratory confirmed MDR-TB cases under a GLC approved project. The management of MDR-TB on an ambulatory basis was expanded to all five regions in the country. Currently, there are 12 treatment and 65 sub-treatment centres offering MDR-TB treatment services through primary health care services and health facilities managed by other sectors. Further improvement of MDR-TB management was achieved in 2011 through establishment of hostels for drug-resistant TB cases, introduction of shortened treatment regimen for MDR TB (20 months). NTP introduced electronic database for programme and cohort analysis for MDR-TB cases on treatment in October 2012.

From December 2011 to June 2012, all 342 MDR-TB cases diagnosed were started on second line treatment regimen; 18 confirmed XDR-TB cases were reported, all started on treatment. Average cure rates among MDR TB patients registered during 2005–2008 was 66.7%; for the cohort of patients registered in 2009 the cure rate was 72%.
Estimated HIV prevalence among adult populations in Nepal is 0.4%. Sentinel surveys of HIV among TB patients conducted in 2006–2007 showed an HIV prevalence of 2.4%; more recent sentinel survey was conducted in 2010 and results should be available in 2013. The country established a National Working Group on TB–HIV and a National TB–HIV Coordination Committee. The national strategy for TB–HIV was officially endorsed by Ministry of Health and Population. Joint planning, evaluation and logistics management, information-sharing, advocacy and operational research were planned by the two programmes.

A national infection control plan and guidelines were developed. An assessment of needs to introduce infection control measures at selected facilities was undertaken.

The NTP's plan and budget are aligned with the national health sector development plan. The programme, working in close collaboration with national and international implementing partners, has successfully involved private practitioners in major cities, where it is estimated PPM has contributed to detect approximately 9% of all new SS+ cases. The expansion of PPM has led to the engagement of several NGOs, public hospitals, all 13 medical college hospitals, both in the public and private sectors and two major prisons in the country. The military hospital is also collaborating with NTP in providing TB services.

Data management is presently paper based; the programme is now introducing Windows-based EPI Centre software. PAL was introduced in two districts in 2007 and later NTP expanded PAL up to covering 14 districts in 2012. The expansion plan is to cover 29 districts with PAL by 2015.

NTP was heavily dependent on donor funding. The programme also received support through the GF rounds 4 and 7 and successfully applied for NSA grant.

**Major achievements**

- full implementation of all six components of the Stop TB Strategy;
- successful implementation and nationwide coverage of MDR/XDR-TB management programme;
full DOTS health institutional coverage in the primary health system including 100% coverage in primary health care centres, health posts and 99% of the sub-health posts in the country;

- successful resource mobilization through the GF (Rounds 4 and 7 and NSA grant) and LHL, Norway;
- introduction of shortened (20 months) treatment regimen for MDR TB management;
- revision of “National Drug Resistant Tuberculosis Management” guidelines;
- revision of NTP General Manual (with introduction of Childhood TB Management section);
- nationwide introduction of the six-month treatment regimen;
- establishment of PAL in 14 districts in the country;
- development of infection control policy, strategy, plan and guidelines and resource mobilization for implementation;
- establishment of hostels for drug-resistant TB cases;
- uninterrupted supply of first and second-line quality assured TB medicines through GDF; and

**Major challenges**

- programme sustainability at risk due to heavy dependence on external funding and one major donor (GF);
- addressing operational issues of accommodation and inadequate socioeconomic support for MDR-TB cases;
- expansion of DOTS in urban areas;
- introducing infection control in TB programme setting;
- addressing stagnant case notification by implementing intensified case detection among at risk and un-reached populations; and
- implementation of proper and effective TB–HIV collaborative activities, including PITC and Three Is.
Activities planned for 2013

- planning and initiation of prevalence survey;
- conducting in-depth programme review;
- expanding DOTS in urban areas;
- starting of various other forms of intensified case-finding;
- introducing infection control in TB programme settings;
- increasing case-detection of MDR, TB–HIV and SS- cases by strategically deploying the eight Xpert MTB/RIF machines + cartridges granted by WHO;
- expanding PAL initiative in additional five districts;
- expanding and consolidating TB–HIV collaborative activities;
- updating and improving the current national strategic plan of NTP to be ready for the next funding opportunity, possibly with GF New Funding Mechanism in 2014.
Case notifications by type of patients, 2011

- New smear-negative: 26.9%
- New smear-positive: 41.7%
- New extrapulmonary: 20.8%
- Relapse: 6.6%
- Treatment after failure: 0.8%
- Treatment after default: 0.7%
- Other: 1.5%

Trends in notified new smear-positive TB cases by age group among males, 2001–2011

- 0-14 years
- 15-24 years
- 25-34 years
- 35-44 years
- 45-54 years
- 55-64 years
- 65+ years

Trends in notified new smear-positive TB cases by age group among females, 2001–2011

- 0-14 years
- 15-24 years
- 25-34 years
- 35-44 years
- 45-54 years
- 55-64 years
- 65+ years

Treatment outcomes of new smear-positive cases, 2010 cohort

- Cured: 87.6%
- Completed: 2.4%
- Died: 3.3%
- Failed: 1.3%
- Defaulted: 2.9%
- Non-evaluated: 2.5%

Trends in treatment outcomes of new smear-positive cases, 2000–2010

- Success rate
- Died
- Failed
- Defaulted
- Not evaluated
### Estimates and notification rates for 2011, Nepal

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population*</td>
<td>30,637,325</td>
</tr>
<tr>
<td>Incidence of all forms of TB</td>
<td>50,000</td>
</tr>
<tr>
<td>(41,000-59,000)</td>
<td></td>
</tr>
<tr>
<td>Incidence rate of all forms of TB (per 100,000 population per year)</td>
<td>163 (135-194)</td>
</tr>
<tr>
<td>Prevalence of all forms of TB</td>
<td>74,000</td>
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<tr>
<td>(33,000 - 130,000)</td>
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<tr>
<td>Prevalence rate of all forms of TB (per 100,000 population per year)</td>
<td>243 (110-428)</td>
</tr>
<tr>
<td>TB death rate (of all forms of TB, excluding HIV per 100,000 population per year)</td>
<td>23 (10-41)</td>
</tr>
<tr>
<td>Notification rate of all forms of TB (per 100,000 population for the year 2011)</td>
<td>116</td>
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<tr>
<td>Notification rate of new smear-positive cases (per 100,000 population for the year 2011)</td>
<td>49</td>
</tr>
<tr>
<td>Case-detection rate (all forms of TB)</td>
<td>71 (60-86)</td>
</tr>
<tr>
<td>Treatment success rate (%) of new smear-positive cases for 2010 cohort</td>
<td>90</td>
</tr>
</tbody>
</table>

Sri Lanka

The country has an estimated population of 21 million and is among the low TB prevalence countries in the Region.

The estimated prevalence and incidence rates of all forms of tuberculosis were respectively 101 and 66 per 100,000 population, in 2011. The notification rate of all forms of TB and new smear-positive cases were respectively 46 and 21, showing a slight but steady increase for all forms of TB compared to previous years. Sri Lanka reached and sustained the target of 85% treatment success rate among new smear-positive cases since 2004; success rate was 86% for the cohort of patients registered in 2010. The overall default rate has dropped from 15% to 4% in the last decade, due to intensified default tracing efforts involving the district and field public health inspectors (PHIs) and other categories of health staff. Innovative case-finding strategy will be implemented through TB–diabetes collaborative activities; pilot phase was undertaken.

The first national level ARTI survey undertaken in the country in 2009 (to capture the transmission level of the year 2004) showed continuing transmission of TB and the estimated ARTI lies between 0.07–0.72%.

A national drug resistance survey was completed in 2006, and this confirmed very low levels of drug resistance: resistance to any drug was of 1.4% among new patients and 8.8% among previously treated cases in the country; the prevalence of MDR TB was 0.17% (1 out of 595 isolates). Protocol for a repeated DRS was developed with the technical assistance of WHO. This will be carried out once funds are identified.
Culture and DST is performed for all patients who fail initial anti-TB treatment regimens, at the time of initiation of treatment for all sputum smear-negative TB patients, patients commencing re-treatment regimens, contacts of MDR-TB cases, healthcare workers, HIV-infected TB cases, migrants and prisoners. MDR-TB is low, only 13 cases were detected in 2011, four among new cases (0.4% of all tested) and 9 among retreatment cases (2.1% of all tested); 10 of them were started on treatment under GLC project. The programme initiated MDR-TB case management under GLC approval with support through Global Fund in 2010. MDR-TB is diagnosed at the national reference laboratory which is supported by the supra-national laboratory at TRC, Chennai, India. Patients are treated initially at the Central Chest Hospital; afterwards they are referred for continuation of treatment at the chest clinics in their respective districts. National guidelines for the management of MDR-TB have been developed. The cohort of MDR-TB patients started on treatment in 2009 (before GLC project) includes only four patients of which two were cured and two died.

HIV co-infection rate among TB patients was estimated at 0.07% in 2011. Since 1993, TB patients were included under the HIV sentinel sero-surveillance survey and the data showed consistently low TB–HIV co-infection rate. In 2011, two TB patients out of 1543 tested was found to be HIV positive (0.13%); in 2010 and 2011, respectively 1.3% and 1.1% of TB patients counselled and tested for HIV resulted HIV-positive. A national policy for provision of CPT and ART to HIV-positive TB patients is in place. In 2011, of the 21 TB–HIV patients detected, all started ART and 71% started CPT.

Laboratory network strengthening is ongoing. In 2011, the number of smear microscopy laboratories increased to 203; for 87%, EQA was carried out and for all of them results showed acceptable performance. Quality assured culture facilities are currently two and a third is planned to be established.

The NTP’s plan and budget are aligned with the national health sector development plan. Public-private collaborative projects were initiated on a limited scale. Thirty eight public hospitals including teaching hospitals and five military hospitals have been involved by NTP. Non-NTP public providers contributed 3579 TB patients to case notification in 2011 (35% of the total) and the private sector contributed 553 TB patients (5% of the total).
The ISTC will be used as a tool for establishing effective TB services within other sectors. There is a plan for initiation of PAL and piloting is expected to start soon.

The government provides the major part of funding for the TB programme, with additional resources from the Global Fund Round 6, and WHO. Global Drug Facility (GDF) grant was approved for the total requirement of adult and paediatric first line drugs.

**Major achievements**

- expansion of DOTS throughout the country (100% coverage);
- reaching and sustaining the global targets;
- further reduction in default rates;
- revision of the National Strategic Plan for 2012–2016;
- development of electronic patient information management system;
- re-introduction and scaling up of the TB control activities in resettled areas of north and eastern provinces;
- establishment of systematic screening of high-risk groups (prisoners, estate population, food handlers and solid waste handlers);
- expansion of service coverage by consultant respiratory physicians;
- expansion of TB culture facilities to the regional level;
- development of infection control plan for chest clinics, TB wards and other healthcare institutions;
- strengthening of infection control at TB treatment facilities;
- quality testing of fixed dose combination drugs established at the national drug quality assurance laboratory;
- refurbishment of MDR-TB ward;
- refurbishment of central drug storage facility;
- improved quality assurance of all chest clinic smear microscopy centres;
systematic review of TB-related deaths;
- strengthening links with parallel health services, estate sector, private sector, and migration services;
- further improvement of TB–HIV collaborative activities;
- operational research on prison community and diabetics.

**Major challenges**
- maintaining adequate number of human resources in the face of high turnover of trained staff;
- reaching the unreached population groups (e.g. population groups with limited access to services, urban slums, prison population, and population in tea and rubber estates);
- scaling up TB control services among returning migrants and re-settled population in northern and eastern provinces;
- addressing the high disease burden and high defaulter rate in urban areas, especially in Colombo;
- overcoming the TB-related stigma;
- financial sustainability.

**Activities planned for 2013**
- further expanding screening of tuberculosis among diabetics and diabetes among tuberculosis patients, diagnosis and management of those diseases in respective clinics;
- improving sputum microscopy laboratory network Introduction of new technology in laboratory diagnosis of TB and MDR-TB;
- establishing two regional TB culture laboratories;
- capacity building of central and district staff by training on procurement and supply management, MDR-TB, TB–HIV co-infection, computer software and data management and operational research;
- upgrading the national tuberculosis reference laboratory to BSL-3 level;
- further improving infrastructure facilities for the delivery of quality TB services;
- strengthening public-private mix in TB control by establishing DOT centres in private hospitals, linking private institutions to the programme data management system and improving proficiency of private laboratories;
- further integrating TB control with existing primary healthcare network;
- improving defaulter tracing and contact screening through field public health inspectors;
- initiating PEN-PAL as a pilot project;
- printing and distribution of manuals and guidelines;
- conducting drug resistance survey, and pharmacovigilance survey on TB;
- developing a Human Resource Development Plan.
Case notifications by type of patients, 2011

- New smear-positive: 64%
- New smear-negative: 23%
- New extrapulmonary: 25%
- Relapse: 2%
- Other (unknown history of treatment): 4%
- Treatment after failure: 1%
- Treatment after default: 1%
- Other: 6%
- Other (unknown history of treatment): 4%

Trends in notified new smear-positive TB cases by age group among males, 2001–2011

Trends in notified new smear-positive TB cases by age group among females, 2001–2011

Treatment outcomes of new smear-positive cases, 2010 cohort

- Cured: 83%
- Completed: 4%
- Died: 7%
- Other: 13%
- Failed: 1%
- Defaulted: 4%
- Non-evaluated: 1%

Trends in treatment outcomes of new smear-positive cases, 2000–2010

- Success rate
- Died
- Failed
- Defaulted
- Not evaluated
### Estimates and notification rates for 2011, Sri Lanka

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
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<tbody>
<tr>
<td>Population*</td>
<td>21 366 789</td>
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<tr>
<td>Incidence of all forms of TB</td>
<td>14 000 (11 000-17 000)</td>
</tr>
<tr>
<td>Incidence rate of all forms of TB (per 100 000 population per year)</td>
<td>66 (55-79)</td>
</tr>
<tr>
<td>Prevalence of all forms of TB</td>
<td>21 000 (9 700 -37 000)</td>
</tr>
<tr>
<td>Prevalence rate of all forms of TB (per 100 000 population per year)</td>
<td>101 (46-176)</td>
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<tr>
<td>TB death rate (of all forms of TB, excluding HIV per 100 000 population per year)</td>
<td>5.4 (3.0-8.3)</td>
</tr>
<tr>
<td>Notification rate of new and relapsed TB (per 100 000 population for the year 2011)</td>
<td>46</td>
</tr>
<tr>
<td>Notification rate of new smear-positive cases (per 100 000 population for the year 2011)</td>
<td>21</td>
</tr>
<tr>
<td>Case-detection rate (all forms of TB)</td>
<td>70 (59-85)</td>
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<tr>
<td>Treatment success rate (%) of new smear-positive cases for 2010 cohort</td>
<td>86</td>
</tr>
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</table>

Thailand

With a population of approximately 70 million, Thailand is one of the 22 high TB burden countries. In 2011, the estimated prevalence and incidence rates of all forms of tuberculosis were 161 and 124 per 100 000 population, respectively. In 2012, Thailand started field operations of its second national TB prevalence survey (the first was conducted in 2006), which provided data to improve current estimates, allow better definition of trends and guide future TB programming.

The country has achieved full DOTS coverage and TB services are available in any hospitals in Thailand; however, access to TB services is to some extent limited for uninsured patients. Despite this limitation, Thailand has made considerable progress in expanding and enhancing TB diagnosis and care, particularly among vulnerable populations (i.e. migrants, people living with HIV/AIDS, and populations in closed settings). The notification rate of all forms of TB and new smear-positive cases were respectively 93 and 47, in 2011, showing a steady increase compared to the period before 2009. The treatment success rate among new smear-positive cases was 85% for the cohort of patients registered in 2010, reaching the former target of 85% treatment success rate (reset to 90% by WHO in 2010). This positive result seems to be primarily driven by decrease in defaulters and failures; another contributing factor has been the increased completeness of reporting that was suboptimal in previous years. By targeting large urban settings such as Bangkok, non-evaluated cases decreased by 70% in last five years. However,
further increase in success rate is challenged by high death rates among HIV-positive TB cases (19% in 2010).

In the South-East Asia Region, Thailand has the highest HIV burden (estimated 1.3% of adult population being infected with HIV). The estimated HIV prevalence among TB cases is 17%. Substantial progress has been made in implementing TB–HIV collaborative activities throughout the country. Provider-initiated HIV Testing and Counselling (PITC) of TB patients have been integrated into national guidelines and are implemented throughout the country. TB–HIV collaborative activities are monitored and supervised mainly by TB programme staff. Routine HIV screening is recommended nationally for all registered TB patients; in 2011, the HIV counselling and testing rate among TB patients was 74% and 15% among all those tested were found to be HIV-positive. Care and treatment for HIV-infected persons is highly subsidized and widely available through the National Health Security Office (NHSO) and Global Fund-supported programmes. Cotrimoxazole preventive therapy (CPT) and anti-retroviral treatment (ART) was provided to 76% and 59% of HIV-positive TB patients respectively. This increase reflects progress made in previous years, particularly for provision of CPT and ART that almost reached the national targets of, respectively, 80% and 60% coverage. In 2011, the treatment success rate for HIV co-infected TB patients who were smear-positive was 72% and 67% for those who were smear-negative. Improved identification of HIV-infected TB patients, together with effective linkages to care and treatment will be required to significantly reduce TB mortality rates.

IPT for HIV-infected persons was introduced in some health facilities as pilot and demonstration projects, but has been largely discontinued. Intensified case-finding among newly detected HIV-positive patients was initiated. Routine and periodic symptomatic screening for TB among HIV-infected patients is undertaken at some hospitals during the initial diagnosis, on follow-up visits and when the decision to initiate antiretroviral therapy is made. In 2011, the proportion of newly diagnosed HIV patients screened for TB was 90% according to programme-based data; hospital facility survey showed that 98.7% of all HIV patients were screened for TB at least once during the year.* In 2011, it was reported that 30% of all estimated HIV-positive incident TB cases received treatment for both TN and HIV.

Based on a national drug resistance survey in 2006, MDR-TB rates were reported to be 1.7% among newly diagnosed cases and 34.5% among previously treated cases; results of a second DRS should be available in 2013. Thailand has an extensive and well-developed laboratory network and in the last year, there was a considerable scale-up of laboratory capacity as well as measures taken to increase access to DST. The capacity for first-line DST is being expanded, establishing culture facilities at selected regional laboratories. Newer molecular technologies for rapid DST, specifically HAIN Genotype MTBDRplus test and Xpert MTB/RIF (implemented in nine sites), have been introduced and the cost of the tests is reimbursed by NHSO for smear-positive patients with a history of previous treatment or household contacts of MDR-TB. However, due to the decentralized nature of laboratory services and the number of private sector laboratories also undertaking TB diagnosis, maintaining quality assurance is one of the key challenges faced by the NTP. In 2011, all 15 established DST facilities were quality assured, but only 45 of the existing 65 culture facilities were quality assured. For smear microscopy laboratories, quality control reached 90% of facilities and 98% of them showed acceptable performance. Laboratory strengthening was being mainly supported through domestic funding and additional funding from GF and Thailand MOPH and US/CDC collaboration (TUC). The NRL has capacity for second-line DST, and has recently been formally designated as the second SNRL in the South-East Asia Region. Culture, DST and SLD for eligible patients (failure of initial and re-treatment regimens, contacts of MDR-TB cases, any patient commencing re-treatment regimen) are available free of cost for Thai citizens through the NHSO. The Global Fund is providing support to one fourth of the MDR hospitals, contributing to expand access to TB diagnostics, care and treatment to non-Thai citizens.

At present, most patients with drug-resistant tuberculosis are diagnosed and managed by university, regional/provincial and some private hospitals, which procure second-line anti-TB drugs using local resources such as the Government Pharmaceutical Organization. The Chest Institute in Bangkok is identifying rather large numbers of MDR-TB cases and initiating treatment for them. This sets a major challenge, because M/XDR-TB patients actually live very far (maximum of three hours) from the regional/provincial hospitals. Recording and reporting should be strengthened because the current system is not designed to collect data for detection and enrolment. NTP began implementation of MDR case management in 2008; national MDR guidelines
were developed and recording and reporting mechanisms modified in line with international recommendations. Due to the frequent modifications of forms, limited experience of TB programme staff in training provision and supervision, and delay in DST results, only 510 confirmed MDR-TB cases were officially reported to the NTP in 2011; however, this figure denotes underreporting as NRL alone diagnosed 547 cases and approximately other 200 cases were diagnosed by the Drug Resistant TB Research Fund (Sriraj Hospital). Out of about 100 hospitals registered by the NHSO as MDR treatment centres, 4 were selected as treatment centres meriting the support of the GLC-approved project in 2010, funded through the Global Fund Round 8. Totally, 233 MDR-TB cases (suspect and confirmed) were reported as started on second-line treatment under GLC project between January 2011 and June 2012; other 342 were reported as started on MDR-TB treatment outside the GLC project but some double counting may have occurred. Model facilities for MDR-TB case management were selected on the basis of their performance in DOTS implementation, the presence of good referral system and measures for infection control.

A national electronic database was piloted and will be rolled out in each of the 12 regions of Thailand to improve real time reporting and case management. TB services are fully integrated within primary health care. Thailand has made remarkable progress in involving NGOs and the private sector. Recently, memoranda of understanding were signed between the National Health Security Office, ministries of labour, and Justice and Médecins Sans Frontières (MSF) for implementation of TB in workplaces, prisons and among migrants. The programme involved private hospital associations, NGOs (World Vision International, American Refugee Committee, Thailand Business Coalition on AIDS to control TB, the Raks Thai Foundation and National Catholic Commission on Migration) to provide TB care according to international standards for TB care (ISTB).

The country’s TB programme is supported mainly by the government budget through the National Health Security Office. Additional support has been provided by GF Round 6 and Round 8, GF Single Stream Funding, and other health partners.
Major achievements
- funding from the National Health Security Office to support TB activities at the provincial and local levels;
- high utilization rate for HIV–TB patients (74% of TB patients counselled and tested for HIV in 2011);
- efforts made to enhance collaborative mechanisms between HIV–TB at national, sub-national, and provincial levels;
- sustained TB services among marginalized populations such as migrants and cross-border populations through NGOs supported by Global Fund;
- sustained TB services in about 140 prisons;
- greater commitment from the Ministry of Public Health: designation of a “Mr/Ms TB” at all hospitals and provisional health offices for improved coordination and oversight;
- GF support secured: all rounds consolidated into the Single Streaming Funding;
- introduction and progressive scale-up of molecular diagnostics, including domestic funding from NHSO to reimburse the cost of these;
- updated TB guidelines in the process of being finalized;
- piloting of an electronic database which will greatly improve real time reporting and case management in each of the 12 regions of Thailand;
- a five-year PMDT plan drafted and currently being budgeted; and
- an action plan for ACSM activities for the country outlined.

Major challenges
- improving quality of DOTS under the decentralized health system and in large urban centres (i.e. Bangkok or capital districts of each province);
- further strengthening of TB–HIV integrated activities, particularly revitalization of the TB–HIV committee, intensified case-finding among known HIV-positive people and IPT;
- revising records and reports of M/XDR-TB to monitor all indicators of detection, enrolment, interim results and final outcomes;
- strengthening referral system between MDR-TB hospitals in the capital districts and community hospitals where MDR/XDR-TB patients live;
- better systematic management and regular supervision of programme activities in the context of decentralization;
- effectively involving private hospitals in TB control; and
- obtaining adequate commitment for implementing TB control activities in the Bangkok metropolitan area;
- addressing human resource management constraints at the central and regional levels.

**Planned Activities in 2013**

- capacity building of health staff at primary care units who live closer to the homes of patients in decentralized settings and in large urban centres (i.e. Bangkok) to enhance treatment adherence;
- strengthening of regular supervision, monitoring and evaluation of the programme;
- rolling out the electronic reporting and recording system nationally;
- revising the recording and reporting system of M/XDR-TB to be consistent with the international recommendations;
- completing and disseminating the results of the TB prevalence survey and the drug resistance survey;
- increasing the involvement of private hospitals and ensuring that practices are in line with the national and international guidelines;
- advocating with the Bangkok Metropolitan Administration for greater commitment to address fragmented service delivery;
- conducting national programme review in the third quarter of 2013.
Case notifications by type of patients, 2011

- New smear-negative: 31%
- New smear-positive: 49%
- New extrapulmonary: 15%
- Relapse: 2.8%
- Treatment after failure: 0.6%
- Treatment after default: 0.8%
- Other: 2.7%
- Other retreatment: 1.3%
- Other retreatment: 1.3%

Trends in notified new smear-positive TB cases by age group among males, 2001–2011

- 0-14 years: [Graph]
- 15-24 years: [Graph]
- 25-34 years: [Graph]
- 35-44 years: [Graph]
- 45-54 years: [Graph]
- 55-64 years: [Graph]
- 65+ years: [Graph]

Trends in TB case notifications, 2001–2011

- All cases: [Graph]
- New smear-positive: [Graph]

Trends in notified new smear-positive TB cases by age group among females, 2001–2011

- 0-14 years: [Graph]
- 15-24 years: [Graph]
- 25-34 years: [Graph]
- 35-44 years: [Graph]
- 45-54 years: [Graph]
- 55-64 years: [Graph]
- 65+ years: [Graph]

Treatment outcomes of new smear-positive cases, 2010 cohort

- Cured: 79.2%
- Completed: 6.3%
- Died: 7.4%
- Failed: 1.6%
- Defaulted: 3.3%
- Non-evaluated: 2.3%

Trends in treatment outcomes of new smear-positive cases, 2000–2010

- Success rate: [Graph]
- Died: [Graph]
- Failed: [Graph]
- Defaulted: [Graph]
- Not evaluated: [Graph]
### Estimates and notification rates for 2011, Thailand

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population*</td>
<td>70 739 361</td>
</tr>
<tr>
<td>Incidence of all forms of TB</td>
<td>86 000 (71 000-100 000)</td>
</tr>
<tr>
<td>Incidence rate of all forms of TB (per 100 000 population per year)</td>
<td>124 (102-147)</td>
</tr>
<tr>
<td>Prevalence of all forms of TB</td>
<td>110 000 (51 000-200 000)</td>
</tr>
<tr>
<td>Prevalence rate of all forms of TB (per 100 000 population per year)</td>
<td>161 (73-282)</td>
</tr>
<tr>
<td>TB death rate (of all forms of TB, excluding HIV per 100 000 population per year)</td>
<td>14 (6-25)</td>
</tr>
<tr>
<td>Notification rate of all forms of TB (per 100 000 population for the year 2011)</td>
<td>93</td>
</tr>
<tr>
<td>Notification rate of new smear-positive cases (per 100 000 population for the year 2011)</td>
<td>47</td>
</tr>
<tr>
<td>Case-detection rate (all forms of TB)</td>
<td>76 (64-93)</td>
</tr>
<tr>
<td>Treatment success rate (%) of new smear-positive cases for 2010 cohort</td>
<td>85</td>
</tr>
</tbody>
</table>

Tuberculosis Control in the South-East Asia Region 2013

Timor-Leste

With a population of about 1.2 million, Timor-Leste is a low TB burden country. However, the notification rate in 2011 was very high, being 373 and 136 per 100 000 population for all forms of TB and new smear-positive cases respectively. In 2007, the estimated incidence and prevalence rates of all forms of TB were 322 and 378 per 100 000 population respectively. The burden estimates clearly need to be revised upwards, because they are consistently lower than the notification rate since 2008, and the case-detection rate is far over 100% (115% in 2011). New estimates for the years 2005–2011 were calculated by WHO using updated methodology, but they are not reported in this report, as they are based on poor assumptions and historical data. They also have very large uncertainty intervals and do not reflect properly the considerable efforts conducted in the country to provide access to TB diagnosis and care. Current TB burden estimates need to be further revised in order to describe the country situation with more reliability and accuracy. Information to improve burden estimates may come from in-depth analysis of TB case notifications over time, better application of the “onion model”, research, results of house-to-house survey of pulmonary TB carried out in 2006–2007 in the sub-district of Bazartette and the district Liquiça and additional evidence from recent prevalence studies carried out in Indonesia.

The notification rate of new smear-positive cases has been increasing since 2007 and this reflects efforts made in TB control in latest years; however, the increasing trend for all forms of TB is slightly reverting in the last two
years. Treatment success rate among new smear-positive cases was 88% for the cohort of patients registered in 2010.

The NTP has established services in all 13 districts and 65 sub-districts of the country; district TB coordinators (DTCs) are working with the district health management teams in all districts and in the 65 community health centres (CHCs) at the sub-district level. CHCs have been strengthened and better-funded in order to include support for conducting outreach activities at the village level through the *servisu integradu da saúde communitária* (SISCa) initiative.

Presently, 19 microscopy centres are based in public and NGO facilities; and all of them have been covered by external quality assurance activities, showing acceptable performance in 2011. In 2011, laboratory technicians were retrained in smear microscopy and EQA took place.

The Ministry of Health supports all staff costs, infrastructure and basic resources. In 2010, additional resources were mobilized through Global Fund Round 7, which is in Phase II.

Six NGO facilities are providing ambulatory care and one is providing in-patient MDR-TB management. There are five NGOs which support the NTP in identifying TB suspects and referring them to DOTS facilities for diagnosis and treatment. Civil society participation is expected to improve and expand with additional funding from Global Fund through Round 7.

MDR-TB rates are estimated to be low, being 2.1% among newly diagnosed and 16% among previously treated TB cases. In 2011, there were no culture and DST facilities in country. A Green Light Committee-approved MDR-TB case management project is in place. A small number of patients with MDR-TB were identified through culture and DST conducted at the Institute of Medical and Veterinary Sciences (IVMS), Adelaide, Australia. Confirmed MDR-TB cases were five in 2010 and two in 2011; four of them were enrolled on MDR-TB treatment in 2011. The treatment of such cases is initiated through an NGO, Klibur Domin in the district of Liquiça. The GDF has provided necessary SLD, with funding supported through UNITAID till 2012 and then GF.
HIV remains relatively uncommon in Timor-Leste. In 2010, a nationwide survey based on representative samples of TB patients showed 1.13% of TB–HIV co-infection rate; data from sentinel sites for surveillance of HIV in TB patients showed similar results (1.0%). A TB–HIV coordinating body is being established at the national level. Initial training for staff at VCTs has been completed and a formal mechanism for referral from VCTs to DOTS centres initiated. In 2011, 6% of all TB patients was tested for HIV and 1.4% of them were found positive.

**Major achievements**
- national Stop TB strategy plan 2011-2015 developed;
- continued funding under Global Fund Round 7 Phase II secured;
- laboratory manual on smear microscopy translated into Tetum, printed and disseminated;
- two rounds of laboratory technicians training conducted;
- sample transportation to SNRL for culture and sensitivity testing strengthened;
- TB–HIV collaboration established at national level and key staff trained;
- most of the local and Cuban doctors working in various health facilities trained on TB control;
- interpersonal communication training conducted for peripheral TB staff;
- joint NTP and WHO supervision of the districts enhanced;
- availability of adequate quantities of FLD/SLD ensured.

**Major challenges**
- improving the quality of DOTS implementation;
- ensuring adequate access to health care services in many remote and hilly areas;
- overcoming high default rates particularly in the two major districts (Dili & Ermera) of the country.
increasing community awareness about TB as well as available services;

- improving effective collaboration between the NACP and NTP at the facility level;

- promoting adherence to standard diagnostic and treatment practices by all levels of health staff;

- improving access to diagnosis for DR-TB amongst re-treatment and failure cases;

- improving drug logistics and management;

- improving data management; and

- building adequate capacity and improving commitment of health staff at district and sub-district levels.

**Activities planned for 2013**

- implementing the external quality assurance system for all microscopy centres.

- approving National Strategic Plan 2011–2015;

- revising the NTP Manual to reflect changes in international guidelines;

- developing medical training modules based on the NTP guidelines;

- developing laboratory training modules for laboratory technicians;

- training of newly trained Timorese doctors from Cuba;

- approving TB–HIV collaborative framework and policy;

- retraining of laboratory technicians in smear microscopy and EQA;

- continuing meetings of TB technical working group and PMDT committee;

- continuing PMDT activities;

- improving involvement of community volunteers in TB suspect referral and DOT provision;
- improving routine programme data recording and reporting, and feedback to districts;
- streamlining regular supervision from national to district level and from district level to sub-district level;
- improving drug management through logistics and drug management training for DTCs;
- improving programme management capacity at national and district levels;
- continuing regular quarterly review meetings with staff from all levels.
Case notifications by type of patients, 2011

- New smear-positive: 36.5%
- New smear-negative: 54.4%
- New extrapulmonary: 7.6%
- Relapse: 0.9%
- Treatment after failure: 0.3%
- Treatment after default: 0.4%
- Other: 0.7%
- Treatment after failure: 0.9%

Notified new smear-positive TB cases by age group and sex, 2011

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-24</td>
<td></td>
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<tr>
<td>25-34</td>
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<td>35-44</td>
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<td>45-54</td>
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<tr>
<td>55-64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>65+</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Treatment outcomes of new smear-positive cases, 2010 cohort

- Cured: 80%
- Completed: 8%
- Died: 3.5%
- Failed: 0.5%
- Defaulted: 4.1%
- Other: 12%
- Non-evaluated: 4.0%

Trends in treatment outcomes of new smear-positive cases, 2001–2010

- Success rate
- Died
- Failed
- Defaulted
- Not evaluated

Tuberculosis Control in the South-East Asia Region 2013
### Estimates and notification rates for 2011, Timor-Leste

<table>
<thead>
<tr>
<th>Population*</th>
<th>1,184,196</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notification rate of all forms of TB (per 100,000 population for the year 2010)</td>
<td>373</td>
</tr>
<tr>
<td>Notification rate of new smear-positive cases (per 100,000 population for the year 2011)</td>
<td>136</td>
</tr>
<tr>
<td>Treatment success rate (%) of new smear-positive cases for 2010 cohort</td>
<td>88</td>
</tr>
<tr>
<td>TB death rate (of all forms of TB, excluding HIV per 100,000 population per year)</td>
<td>63 (26-115)</td>
</tr>
</tbody>
</table>

The new estimates of prevalence and incidence, and case detection rate, as revised by WHO in 2010, are based of poor assumptions and are not reported herewith until further revision.

*Source: Projections of 2004 Census data (growth factor 3.2%), National Bureau of Statistics.
Situation analysis of achievement of MDGs goal 6 for tuberculosis

For each country in the South-East Asia Region, the progress towards the achievement of Millennium Development Goal (MDG) 6, to combat HIV/AIDS, malaria and other diseases, was analysed for the extent of tuberculosis control.

The MDG target for tuberculosis control is:

- By 2015 halt and begin to reverse the incidence of tuberculosis

Additionally, the situation towards achievement of targets linked to the MDGs and endorsed by the Stop TB Partnership was analysed, the targets being:

- to halve TB prevalence rate by 2015, compared with 1990 levels
- to halve TB death rate by 2015, compared with 1990 levels

For prevalence and mortality rates, trends over time from 1990 to 2011 were analysed and projections for the years 2012–2015 were made using exponential smoothing models fitted to data from 2005–2011. Trends and projections have uncertainty bands whose width reflects the quality and completeness of data on which estimates are based. For some countries, particularly for prevalence, projections are very uncertain.

For countries with poor TB burden estimates, selected main indicators in the implementation component of the global plan to STOP TB 2011–2015 were considered for analysis, such as:

- treatment success rate (in annual cohort): target 90%;
- number of cases diagnosed, notified and treated according to the DOTS approach: no country-specific targets set;

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1 For details on methodology refer to Annex 1 of Global Tuberculosis Control: WHO report 2012
- number of laboratories with sputum smear microscopy services per 100,000 population: target >1;
- percentage of previously treated TB patients tested for MDR-TB: target 100%;
- percentage of new TB patients tested for MDR-TB: target 20%;
- percentage of TB patients tested for HIV: target 100%; and
- percentage of HIV-positive TB patients treated with ART: target 100%.
Bangladesh

Although TB prevalence rate (best estimate) is showing a declining trend from 1990 to 2011, the decrease is happening at a pace that is unlikely to lead to halving TB prevalence by 2015 compared to the 1990 baseline; currently, projections till 2015 suggest that Bangladesh will not reach the MDG target for prevalence reduction (Graph 1). However, estimates and projections have very large uncertainty bounds, underlining the need for more accurate burden estimates to better assess the achievement of the prevalence target.

TB mortality rate is showing a declining trend from 1990 to 2011, with rather a steep slope between 2000 and 2007, slighter decline afterwards. Despite progress in reducing mortality (decreased by about 25% in 2011 compared to 1990 level), according to projections, it seems unlikely that Bangladesh will reach the target of halving TB mortality by 2015 compared to the 1990 baseline (Graph 2). Similarly, mortality estimates are affected by large uncertainty bounds that limit the assessment of mortality trend.

The analysis of trend in TB incidence from the notifications data proves to be difficult due to the considerable change in case notification due to important case-finding efforts. Current data were considered insufficient to determine a reliable trend, therefore, incidence was assumed to follow a horizontal trend going through the most recent estimate of incidence (graph 3). Additional information is needed in order to better assess whether Bangladesh would achieve the target of reverting TB incidence trend. However, it seems unlikely that Bangladesh will reach the MDG target by 2015;
in fact, despite the good performance of the TB programme on treatment success rate (target of 90% was steadily reached since 2004), estimated case detection of all forms of TB is still low (about 45% in 2011).

**Graph 1: Trend in estimated TB prevalence rates 1990–2011 and forecast TB prevalence rates 2012–2015, Bangladesh**

Note: Shaded areas represent uncertainty bands. The horizontal dashed line represents the target of a 50% reduction by 2015 compared with 1990. The other dashed lines show projections up to 2015.


Note: Shaded areas represent uncertainty bands. The horizontal dashed line represents the target of a 50% reduction by 2015 compared with 1990. The other dashed lines show projections up to 2015.

**Graph 3: Trend in case notification rates (new and relapse cases, all forms) and estimated TB incidence rates, 1990–2011, Bangladesh**

Note: Black line represents notification rate, green line represents estimated incidence (including HIV), red line represents incidence of HIV-positive TB cases, shaded areas represent uncertainty bands.
Bhutan

TB prevalence rate is showing a constant declining trend from 1990 to 2011, and Bhutan is estimated to have reached the target of halving TB prevalence compared to the 1990 baseline and after 2005 also, the upper uncertainty bound is below the target line (Graph 1). Projections for 2012–2015 suggest that the declining trend will steadily continue.

TB mortality rate follows the same declining trend from 1990 to 2011 as prevalence, and the target of halving TB mortality by 2015 compared to 1990 baseline was reached in the early 1990s; projections till 2015 confirm the declining trend and suggest that mortality related to tuberculosis in Bhutan would virtually not represent a public health problem anymore (Graph 2).

The analysis of trend in TB incidence from the notifications data shows a steady decline in the past decade. However, the latest yearly notification data are showing increasing figures that probably depend on further case-finding efforts but may also reflect underestimation of real incidence level in the country (Graph 3). Despite the low HIV prevalence in the population, estimates of incidence of HIV-positive TB case show a slightly increasing trend that might jeopardize TB control efforts to date. Although Bhutan is already achieving the MDG target of reverting TB incidence by 2015, further efforts should be made to maintain current attainments and address new challenges in TB control.


Graph 3: Trend in case notification rates (new and relapse cases, all forms) and estimated TB incidence rates, 1990–2011, Bhutan.

Note: Shaded areas represent uncertainty bands. The horizontal dashed line represents the target of a 50% reduction by 2015 compared with 1990. The other dashed lines show projections up to 2015.

Note: Shaded areas represent uncertainty bands. The horizontal dashed line represents the target of a 50% reduction by 2015 compared with 1990. The other dashed lines show projections up to 2015.

Note: Black line represents notification rate, green line represents estimated incidence (including HIV), red line represents incidence of HIV positive TB cases, shaded areas represent uncertainty bands.
Democratic People’s Republic of Korea

Prevalence and incidence estimates for DPR Korea have not been revised in many years and are based on information that may be outdated. Uncertainty bands around best estimates are very large; therefore, the analysis of TB prevalence and incidence trend needs to be cautiously considered.

TB prevalence rate seems to consistently decrease, particularly since 2000; in 2010, DPR Korea almost reached the target of halving the 1990s prevalence level, but in 2011, there was a sudden, although minor change upwards (Graph 1). Despite the 2011 twitch in the decreasing trend, projection for 2010–2015 seems to confirm progressive decline of prevalence rate up to levels lower than 50% of 1990’s baseline. However, uncertainty bounds are very wide, particularly the upper band, and projections could not be considered reliable.

TB mortality rate has sharply decreased since 1990, reaching the target of 50% reduction of 1990 baseline in 2007 and surpassing it in the following years (Graph 2). Projections until 2015 seem to confirm this achievement and suggest that mortality rate will reach very low levels by 2015 (around 1 death due to TB per 100 000 population).

The analysis of trend in TB incidence from the notifications data proves to be difficult due to the substantial change in case notification; increased notification rate is likely to be related to important case-detection efforts,
however, not enough evidence is available to exclude a parallel increase in TB incidence. Therefore, going through the most recent estimate of incidence, it was assumed to follow a horizontal trend that needs to be further revised, considering that 2011 notifications surpassed the expected yearly incident cases (Graph 3). Additional information is needed in order to better assess whether DPR Korea would achieve the target of reverting TB incidence trend by 2015.

Despite the analysis of TB burden, indicators do not allow reliable evaluation of likelihood to achieve MDGs goals. Progress towards TB control in DPR Korea is highlighted by some indicators related to implementation of the global plan to STOP TB 2011–2015. Treatment success rate is steadily above 85% since 2000, and it was 90% in 2010 cohort; notification rate for smear-positive and all TB cases is steadily increasing over time, particularly in the latest years; there is 1.2 microscopy laboratory per 100,000 population and one culture and DST facility has been established in the country. Programmatic management of drug-resistant TB has started and the first MDR-TB patients have been put on second line treatment in 2012. No indicators are available to assess implementation of TB–HIV control activities.
Graph 1: Trend in estimated TB prevalence rates 1990–2011 and forecast TB prevalence rates 2012–2015, DPR Korea

Note: Shaded areas represent uncertainty bands. The horizontal dashed line represents the target of a 50% reduction by 2015 compared with 1990. The other dashed lines show projections up to 2015.


Note: Shaded areas represent uncertainty bands. The horizontal dashed line represents the target of a 50% reduction by 2015 compared with 1990. The other dashed lines show projections up to 2015. The “x” symbol represents the mortality data from vital statistics reported by DPR Korea that were adjusted to account for incomplete coverage - deaths with no reported cause - and ill-defined causes but not for miscoding of causes of deaths.

Graph 3: Trend in case notification rates (new and relapse cases, all forms) and estimated TB incidence rates, 1990–2011, DPR Korea

Note: Black line represents notification rate, green line represents estimated incidence, shaded areas represent uncertainty bands.
India

TB prevalence rate is showing a steady and important declining trend since 2000 (Graph 1). Projection for 2012–2015 is showing continuation of the current trend reaching more than 50% reduction of 1990 level by 2015. Despite rather large uncertainty intervals, India is likely to reach the prevalence target by 2015.

TB mortality rate followed a flat trend from 1990 to 2003, with a consistently declining slope afterwards. Projections until 2015 suggest that India could reach the target of halving 1990 mortality rate by 2015, even though projected estimates have a large upper uncertainty band that remains above the target (Graph 2).

The analysis of trend in TB incidence shows that incidence started to revert in mid-2000 and is steadily following this declining trend (Graph 3). In fact, taking into consideration efforts and achievements in TB control and the recent revision of TB burden estimates, the slightly declining trend of notification rate is considered to reflect a real decrease in TB incidence. India’s achievement in reaching the MDG goal related to halting and reverting TB incidence by 2015, positively reflects on the overall situation of the South-East Asia Region towards achievement of MDG goals.
Graph 1: Trend in estimated TB prevalence rates 1990–2011 and forecast TB prevalence rates 2012–2015, India

Note: Shaded areas represent uncertainty bands. The horizontal dashed line represents the target of a 50% reduction by 2015 compared with 1990. The other dashed lines show projections up to 2015.¹

Graph 2: Trend in estimated TB mortality rates 1990–2011 and forecast TB prevalence rates 2012–2015, India

Note: Shaded areas represent uncertainty bands. The horizontal dashed line represents the target of a 50% reduction by 2015 compared with 1990. The other dashed lines show projections up to 2015.¹

Graph 3: Trend in case notification rates (new and relapse cases, all forms) and estimated TB incidence rates, 1990–2011, India

Note: Black line represents notification rate, green line represents estimated incidence (including HIV), red line represents incidence of HIV positive TB cases, shaded areas represent uncertainty bands.¹

¹ All graphs are based on provisional estimates (not yet endorsed by (GoI).
Indonesia

TB prevalence rate is showing a declining trend from the late 1990s to 2011, with a smoother slope in the last five year period. Projection for 2012-2015 is showing a further slight decline, although not sufficient to reach 50% decline compared to 1990 level (Graph 1). According to current data, Indonesia seems unlikely to achieve the prevalence reduction target by 2015. However, uncertainty intervals around estimates and projection are very large, suggesting the need for estimate revision; TB prevalence estimates will be certainly revised following the results of the ongoing national prevalence survey, allowing for better assessment of the country towards MDGs goals achievement.

As TB prevalence and TB mortality rates declined considerably from the late 1990s to 2011 with slower decrease in the last five years. The best estimate of mortality rate in 2011 reached 50% of the 1990 baseline and projections for 2015 suggest that the target of mortality reduction could be maintained until 2015 (Graph 2). However, uncertainty bands are rather large and the upper band stays entirely above the target; estimates should be improved in order to provide more accurate information.

Increased notification rates over time, with a slower pace in the last five years, are likely to be related to important case-detection efforts instead of reflecting a parallel increase of real incidence. It is estimated that a very slight decrease in TB incidence started to occur due to considerable improvement in TB and TB–HIV control activities (Graph 3). Trends in notification rate and other programme performance indicators in the next years will help to confirm whether Indonesia is achieving the target of reverting TB incidence trend by 2015.

Note: Shaded areas represent uncertainty bands. The horizontal dashed line represents the target of a 50% reduction by 2015 compared with 1990. The other dashed lines show projections up to 2015.


Note: Shaded areas represent uncertainty bands. The horizontal dashed line represents the target of a 50% reduction by 2015 compared with 1990. The other dashed lines show projections up to 2015.

Graph 3: Trend in case notification rates (new and relapse cases, all forms) and estimated TB incidence rates, 1990–2011, Indonesia

Note: Black line represents notification rate, green line represents estimated incidence (including HIV), red line represents incidence of HIV positive TB cases, shaded areas represent uncertainty bands.
Maldives

TB prevalence rate is showing a steep decline from 1990 to 1997, with reduction of prevalence to more than 50% of 1990 level. From 1998 to 2011, a further steady decline up to low prevalence level is observed; projections for 2012–2015 confirm that Maldives is likely to maintain the prevalence rate (including upper uncertainty band) to a low level and achieve the prevalence target by 2015 (Graph 1).

TB mortality rate had a sharp decline until 2005, followed by a flat trend at a very low level in the subsequent five years and slight increase in 2011. Projections until 2015 show a very low mortality rate, far below the MDG target; however, the uncertainty bounds are larger and suggest a risk of reaching a mortality rate higher than the rates of the 2006–2010 period (Graph 2).

The incidence target was also achieved, with a steady and important decrease of incidence throughout the last 20 years (Graph 3). In fact, taking into consideration the efforts and achievements in TB control, the declining trend of notification rate is considered to reflect the real decrease in TB incidence.

TB epidemiology in Maldives seems to be shifting from epidemic phase to low endemic phase; however, efforts towards TB control should continue to be strengthened, as estimated incidence is still above 20/100 000 population (threshold for low incidence country) and shift of infection to older age groups is still not patent. The recording and reporting system for TB should be strengthened in order to reliably monitor further progress in TB control with timeliness and accuracy.

Note: Shaded areas represent uncertainty bands. The horizontal dashed line represents the target of a 50% reduction by 2015 compared with 1990. The other dashed lines show projections up to 2015.


Note: Shaded areas represent uncertainty bands. The horizontal dashed line represents the target of a 50% reduction by 2015 compared with 1990. The other dashed lines show projections up to 2015. The “x” symbol represents the mortality data from vital statistics reported by Maldives that were adjusted to account for incomplete coverage - deaths with no reported cause - and ill-defined causes but not for miscoding of causes of deaths.

Graph 3: Trend in case notification rates (new and relapse cases, all forms) and estimated TB incidence rates, 1990–2011, Maldives (Black line represents notification rate, green line represents estimated incidence, shaded areas represent uncertainty bands)
Myanmar

TB prevalence rate has a rather flat trend until 2000 that decreases afterwards. Projections for 2012–2015 suggest that Myanmar could achieve 50% reduction of 1990 prevalence level by 2015; however, the upper uncertainty bound of projection stays above the target (Graph 1). It has to be considered that uncertainty bounds around 1990 baseline are very large, making it difficult to have a reliable assessment of country situation in regards of prevalence indicator. However, using data of the 2009 prevalence survey and the repeat survey planned in 2015, Myanmar will be able to directly measure the trend of prevalence in this time interval, gaining valuable indication of programme performance in reducing TB prevalence.

TB mortality rates follow a steep declining slope from 1998 until mid-2000 and continue to decline until 2011 with less sharp pace, falling to below 50% reduction of 1990 mortality baseline. Projections until 2015 describe a slightly persistent declining trend and indicate that Myanmar could reach the target of halving 1990 mortality rate by 2015, although the upper uncertainty band does not fall entirely below the target line (Graph 2).

The analysis of trend in TB incidence (of all cases and HIV-positive TB cases) from the notifications data shows that incidence slightly increased from 1990 to 2000; afterwards, due to case detection efforts and strengthening of TB control activities, the trend started to revert and in 2011, incidence was slightly lower than the 1990 level (Graph 3). Considering uncertainty bands around best incidence estimates, the reversion of trend is less clear and the slightly increasing incidence of HIV-positive TB cases might hamper the achievement of the incidence goal. However, in light of efforts to strengthen TB control in the country, increased case-finding and addressing challenges like TB–HIV co-infection and MDR-TB, Myanmar seems to be on track for achieving MDGs goal for incidence reduction.

Note: Shaded areas represent uncertainty bands. The horizontal dashed line represents the target of a 50% reduction by 2015 compared with 1990. The other dashed lines show projections up to 2015.


Note: Shaded areas represent uncertainty bands. The horizontal dashed line represents the target of a 50% reduction by 2015 compared with 1990. The other dashed lines show projections up to 2015.

Graph 3: Trend in case notification rates (new and relapse cases, all forms) and estimated TB incidence rates, 1990–2011, Myanmar

Note: Black line represents notification rate, green line represents estimated incidence (including HIV), red line represents incidence of HIV positive TB cases, shaded areas represent uncertainty bands.
Nepal

TB prevalence rate, after a clear declining trend from 1990 to 2000, decreased very slightly until 2006 and the tendency reverted from 2007 onwards; the projection for 2012–2015 reflects this recent increasing trend (Graph 1). Estimates and projections are affected by wide uncertainty bands suggesting need for improving current estimates; Nepal is indeed planning to conduct a prevalence survey in order to better understand the real burden in the country and reasons for missing cases despite continuous efforts in expanding coverage of TB services and outreach activities. To date, it seems unlikely that Nepal will achieve the target of prevalence reduction to 50% of the 1990 baseline level.

After a declining trend from 1990 to 2000, the TB mortality rate is showing a rather flat trend in 2000–2009, very close to the target of 50% of the 1990 baseline; in 2010–2011, there was a minor increase, and projection until 2015 suggests risk for further increase that could hamper the possibility of reaching the mortality reduction goal (Graph 2). In the next ten years, efforts towards reduction of mortality are essential to put Nepal again on track for the achievement of this target.

The analysis of trends in TB incidence from the notifications data proves to be difficult due to a fairly constant trend in notifications of pulmonary cases in the last decade, despite important case-finding efforts and expansion of population coverage for TB service delivery. The flat trend may be the result of increased case detection combined with decreasing incidence. However, in the absence of evidence of change in TB determinants which could have led to a significant change in TB incidence, current data were considered insufficient to determine a reliable trend, therefore, incidence was assumed to follow a horizontal trend, going through the most recent estimate of incidence (Graph 3). Additional information is needed in order to better assess whether Nepal would achieve the target of reverting the TB incidence trend by 2015.

Note: Shaded areas represent uncertainty bands. The horizontal dashed line represents the target of a 50% reduction by 2015 compared with 1990. The other dashed lines show projections up to 2015.


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Graph 3: Trend in case notification rates (new and relapse cases, all forms) and estimated TB incidence rates, 1990–2011, Nepal

Note: Black line represents notification rate, green line represents estimated incidence (including HIV), red line represents incidence of HIV positive TB cases, shaded areas represent uncertainty bands.
Sri Lanka

TB prevalence rate presents a slightly declining trend from 1995 to 2004 and in the following years, it stabilized at around 100 per 100 000 population. According to projections till 2015, no major change is expected and it seems unlikely that Sri Lanka will reach the target of halving TB prevalence by 2015 compared to the 1990 baseline (Graph 1). However, estimates and particularly projections have very large uncertainty bounds underlining the need for more accurate burden estimates to better assess achievement of prevalence target.

TB mortality rate shows a declining trend from 2000 to 2011. Despite progress in reducing mortality (decreased by about 50% in 2011 compared to the peak in 2000 and by about 35% compared to the 1990 baseline), and further decreasing trend described by the projection, it seems unlikely that Sri Lanka could reach the target of halving TB mortality compared to the 1990 baseline by 2015 (Graph 2). However, mortality rate is at low levels in the country and it is expected to attain less than 5 deaths due to TB per 100 000 population by 2015.

The notification rate has been increasing from 1995 to 2000 and remains fairly stable until 2011. Implementation of DOTS in a phased manner between 1997 and 2005 (phased expansion of microscopy lab network and recruitment/training of staff) might partly explain the slow pace of the increase in case notifications. There are no evidences of changes in TB determinants which could have led to a significant change in TB incidence. Current data were considered insufficient to determine a reliable trend; therefore, incidence was assumed to follow a horizontal trend going through the most recent estimate of incidence (Graph 3). Additional information is needed in order to better assess whether Sri Lanka would achieve the target of reverting TB incidence trend by 2015.

Note: Shaded areas represent uncertainty bands. The horizontal dashed line represents the target of a 50% reduction by 2015 compared with 1990. The other dashed lines show projections up to 2015.


Note: Shaded areas represent uncertainty bands. The horizontal dashed line represents the target of a 50% reduction by 2015 compared with 1990. The other dashed lines show projections up to 2015. The “x” symbol represents the mortality data from vital statistics reported by Sri Lanka that were adjusted to account for incomplete coverage - deaths with no reported cause - and ill-defined causes but not for miscoding of causes of deaths.

Graph 3: Trend in case notification rates (new and relapse cases, all forms) and estimated TB incidence rates, 1990–2010, Sri Lanka

Note: Black line represents notification rate, green line represents estimated incidence (including HIV), red line represents incidence of HIV positive TB cases, shaded areas represent uncertainty bands.
Thailand

After a minor decrease in the early 1990s, TB prevalence sharply increased during the decennium and peaked in 2000; it started declining afterwards, but due to this bell-shape trend, 2011 prevalence rate was only 20% lower than the 1990 baseline. Projections for 2012–2015 indicate further decline, but it seems unlikely that Thailand will achieve target of halving 1990 prevalence (Graph 1). However, estimates and particularly projections are affected by wide uncertainty bands. Better estimates will be made once the results of the recently concluded prevalence survey will be available.

Similar to TB prevalence, TB mortality rates sharply increased from the early 1990s to 2000 and started declining afterwards; in 2011, mortality rate is only 25% lower compared to 1990 baseline. Projection for 2012–2015 shows continuation of the recent declining trend, although it seems unlikely that Thailand could be reached the target of mortality reduction to 50% of the 1990 level by 2015 (Graph 2).

Notification rate trend shows substantial changes overtime, especially between 1995 and 2000, which is most probably due to disruption of reporting and recording system and possibly to discontinuation of services. After 2000, notification rate shows a constant slight increase that it is likely to be related to changes in the TB programme (i.e. case finding efforts, improvement of the quality of smear laboratories and implementation of TB–HIV activities) instead of changes in TB epidemiology. The impact of HIV epidemic in terms of incident HIV-positive TB cases seems to decrease from 1995 onwards. It is, therefore, estimated that TB incidence temporarily increased in early 2000s and started decreasing until 2011 reaching 30% reduction compared to the peak in 2002 and 10% reduction compared to 1990 (Graph 3). Hence, Thailand is well on track to revert TB incidence by 2015.

Note: Shaded areas represent uncertainty bands. The horizontal dashed line represents the target of a 50% reduction by 2015 compared with 1990. The other dashed lines show projections up to 2015.


Note: Shaded areas represent uncertainty bands. The horizontal dashed line represents the target of a 50% reduction by 2015 compared with 1990. The other dashed lines show projections up to 2015. The “x” symbol represents the mortality data from vital statistics reported by Thailand that were adjusted to account for incomplete coverage - deaths with no reported cause - and ill-defined causes but not for miscoding of causes of deaths.

Graph 3: Trend in case notification rates (new and relapse cases, all forms) (black) and estimated TB incidence rates, 1990–2011, Thailand

Note: Black line represents notification rate, green line represents estimated incidence (including HIV), red line represents incidence of HIV positive TB cases, shaded areas represent uncertainty bands.
Burden estimates for Timor-Leste have been recently revised by WHO; however, they are based on poor assumptions and historical data and have very large uncertainty bands around best estimates, even larger for projections. The analysis of TB prevalence, mortality and incidence trend cannot be considered accurate and reliable, and is not reported here. Furthermore, the 1990 baseline is not available for Timor-Leste; 2002 baseline should be used and proportion of reduction against this baseline was not set.

Although it is not possible to assess country situation toward achievement of TB-related MDGs goals, some indicators could be considered in order to describe efforts to control TB burden in Timor-Leste.

Notification rate of TB cases increased from 2002 to 2011, even though the trend was not linear and the increase was more evident in years 2004–2005 and 2009–2010. This pattern is mainly driven by smear-negative TB cases whose number of notified cases doubled between 2002 and 2009, followed by a drop of 20% by 2011; between 2008 and 2011, there was a significant increase also in smear-positive cases as result of the expansion and strengthening of microscopy laboratory network (Graph 1). Changes in case notification may have been influenced by political instability leading to a flux of refugees and migration of population to the peripheral areas, but more likely, they are related to case-finding efforts by the national TB programme, such as increased number of hospitals and health facilities providing TB services, microscopy centres and doctors and health professionals trained on TB.
Treatment success rate was around 80% until 2006 and increased afterwards, reaching and surpassing the former target of 85% (88% in 2010 cohort), particularly thanks to reduction of defaulters; the country seems on track to reach the new target of 90% by 2015.

There are 1.6 laboratories with sputum smear microscopy services per 100,000 population; no culture and DST facility is available in country but links with SNRL have been established and transportation system for samples strengthened. To date, the percentage of previously treated TB patients tested for MDR-TB is still negligible. Only 6% of notified TB patients had HIV test results recorded; although the target of 100% is still far, HIV testing among TB patient is slightly increasing every year.

Progress towards TB-related MDG goals have been made, as showed by increasing case notification and high treatment success rate. However, burden estimates should be revised in order to assess current case-detection rate and need for DOTS expansion and enhancement. Some components of the Stop TB Plan 2011–2015, such as programme management of drug-resistant TB, TB–HIV collaborative activities and laboratory strengthening are being currently addressed, but need further efforts in their implementation.

Graph 1: Notification of TB cases per type of cases and year, 2002–2011, Timor-Leste

Number of TB cases notified

New smear-positive  New smear-negative  New extrapulmonary  Retreatment

Years

0 1000 2000 3000 4000 5000

2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
All 11 Member States have sustained country-wide access to DOTS. Each year, more than 2 million TB cases are being registered for treatment and the treatment success rate among new smear-positive pulmonary TB cases has remained above 85% since 2005, and was 88% in 2010. The TB mortality rate has decreased by 40% since 1990 and the South-East Asia Region is on track to achieve the global target of a 50% reduction by 2015. The decline in the prevalence is observed in all Member countries and in some countries, it is over 50%. Approximately 40% of the estimated global number of cases occurs in the South-East Asia Region (based on current estimates) as well as more than one fourth on the MDR-TB burden. The collaboration between TB and HIV control programmes is improving. Many of the constraints to effective implementation of TB control services in Member States relate to underlying weaknesses and under-financing of national health systems in general, many of which are already overstretched in terms of both infrastructure and staffing. To enable universal access and continuing scale-up of critical interventions, there is an urgent need to sustain current financial commitments and to advocate for additional financial resources.