Tuberculosis Control
in the South-East Asia Region
Tuberculosis Control
in the South-East Asia Region

The Regional Report: 2006

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## Abbreviations

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<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ACSM</td>
<td>advocacy, communication and social mobilization</td>
</tr>
<tr>
<td>ADB</td>
<td>Asian Development Bank</td>
</tr>
<tr>
<td>AFB</td>
<td>acid-fast bacilli</td>
</tr>
<tr>
<td>AIDS</td>
<td>acquired immunodeficiency syndrome</td>
</tr>
<tr>
<td>ART</td>
<td>antiretroviral treatment</td>
</tr>
<tr>
<td>ARTI</td>
<td>annual risk for tuberculosis infection</td>
</tr>
<tr>
<td>CIDA</td>
<td>Canadian International Development Agency</td>
</tr>
<tr>
<td>DFID</td>
<td>United Kingdom Department for International Development</td>
</tr>
<tr>
<td>DOT</td>
<td>directly observed treatment</td>
</tr>
<tr>
<td>DOTS</td>
<td>internationally-recommended strategy for tuberculosis control</td>
</tr>
<tr>
<td>DPR Korea</td>
<td>Democratic People’s Republic of Korea</td>
</tr>
<tr>
<td>DRS</td>
<td>drug-resistance survey/surveillance</td>
</tr>
<tr>
<td>DST</td>
<td>drug-susceptibility testing</td>
</tr>
<tr>
<td>EP</td>
<td>extra-pulmonary</td>
</tr>
<tr>
<td>EQA</td>
<td>external quality assessment</td>
</tr>
<tr>
<td>Fidelis</td>
<td>Fund for Innovative DOTS Expansion through Local Initiatives to Stop TB</td>
</tr>
<tr>
<td>GDF</td>
<td>Global TB Drug Facility</td>
</tr>
<tr>
<td>GFATM</td>
<td>Global Fund to fight AIDS, Tuberculosis and Malaria</td>
</tr>
<tr>
<td>GLC</td>
<td>Green Light Committee</td>
</tr>
<tr>
<td>HIV</td>
<td>human immunodeficiency virus</td>
</tr>
<tr>
<td>HRD</td>
<td>human resources development</td>
</tr>
<tr>
<td>ISAC</td>
<td>Intensified Support and Action Countries</td>
</tr>
<tr>
<td>KNCV</td>
<td>Royal Dutch Tuberculosis Association</td>
</tr>
<tr>
<td>MDG</td>
<td>Millennium Development Goal</td>
</tr>
</tbody>
</table>
Asia has the highest burden of tuberculosis (TB) in the world; every 30 seconds a person dies unnecessarily of TB in Asia. The top three high-TB burden countries in the world – China, India and Indonesia – account for nearly half of the global TB burden. The WHO South-East Asia Region (SEA Region) covers 11 countries with a combined population of 1.6 billion. The Region is home to a third of all TB cases in the world. In 2005, of the estimated 5 million prevalent cases of TB almost 3 million were new cases, reflecting an incidence rate of 182 per 100,000 population. Over half a million people continue to die of the disease every year in the Region, one person every minute.

The global HIV epidemic has had a variable impact in countries in the Region with Myanmar, Thailand and six states in India reporting generalized HIV epidemics and Indonesia and Nepal reporting concentrated epidemics. In the Region, 2.5-3 million people are currently estimated to be infected with both HIV and TB. While the levels of multidrug-resistant forms of TB (MDR-TB) are still low at under 3%, it translates into a large number of TB cases with drug resistance, given the large numbers of TB patients in the Region.

Encouragingly, countries in the Region have made remarkable progress in providing effective TB control services since the introduction of the DOTS strategy over a decade ago. Three countries in the Region have already surpassed the 2005 global targets of 70% case detection and 85% treatment success – the Democratic People’s Republic of Korea (DPR Korea), Maldives and Sri Lanka while Bhutan, Myanmar and Nepal are within reach of the targets. Other
countries, with the exception of Thailand and Timor-Leste, are making steady progress towards the set targets.

Due to the rapid expansion of high quality DOTS services in the Region, the TB case-detection rates increased steadily to over 60% while treatment success rates were consistently over 85% among new smear-positive cases. This progress compares well with the overall case-detection and treatment success rates which now stand globally at 53% and 82% respectively.

Between 1997 and 2005, of the almost 15 million patients registered for TB treatment in the Region, six million were under DOTS programmes, thereby averting nearly 500 000 deaths. For the first time in decades, in some settings in countries around the Region, a demonstrable impact on TB morbidity and mortality was seen.

National TB control programmes (NTPs) adopted the new Stop TB strategy and have either initiated or are implementing several of the additional interventions under this broadened strategy. Alongside intensified efforts to improve the quality of services, programmes are strengthening partnerships with other providers, particularly nongovernmental organizations (NGOs), the private health sector, medical teaching institutions and large public employment sectors. Private and public partnerships for TB are being scaled up in seven countries. Nine countries have actively involved NGOs in TB services. Reports from India, Indonesia and Myanmar indicate that, where initiated, private–public partnerships for TB have resulted in up to 25% increase in cases notified with good treatment outcomes. Medical schools in several countries have begun to teach and practise DOTS; more than 200 medical colleges in India have established DOTS centres in their practice areas. DOTS services are also beginning to be provided at workplaces. Providers in the private sector and other sectors are being sensitized to the need for adhering to international standards in TB care to ensure that standardized diagnostic and treatment practices are followed widely.

To improve the uptake of available services, NTPs are increasingly focusing on mass and point of service communication and social mobilization drawing on the many successful examples of community-based initiatives and community care interventions.

Interventions for HIV-associated TB have been made available widely in India and Thailand and are being scaled up in Indonesia and Myanmar. Bangladesh, Indonesia, Nepal and Sri Lanka have prepared plans for the
commencement of these activities. Pilot DOTS-Plus projects to manage drug-resistant TB are in progress in India and Nepal, and plans for scaling up these services have been prepared. DOTS-Plus projects have been planned in Bangladesh, Bhutan, Myanmar, Sri Lanka and Timor-Leste.

In terms of resources, the Global TB Drug Facility (GDF) continues its support to nine countries including grants for drugs for a further period of three years in DPR Korea and Myanmar. Additional funding through the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) and other multilateral and bilateral donors has resulted in reducing the funding gap to less than 5% for TB programmes in the Region, with the exception of DPR Korea and Myanmar.

A wide range of issues, however, need to be addressed to sustain and further build on these efforts. Primary health care systems through which TB services are delivered are overstretched. Thus it is most important to first develop adequate technical and managerial expertise within the Region and ensure that the necessary infrastructure and logistics support are available to provide quality-assured services for TB, particularly in countries where health care has been decentralized. Human resource and infrastructure development therefore continue to be priorities.

DOTS services are now extensively available through public health care systems in all Member States. The challenge now lies in ensuring that all cases of TB are diagnosed and registered for treatment under DOTS and then effectively reported by NTPs. Increasing collaboration with other health care providers should contribute to greater numbers of TB cases being diagnosed and treated in accordance with international standards through all health sectors.

Planning and implementing interventions to address TB/HIV and MDR-TB to sustain the hard-won gains in TB control, particularly in Member States with high HIV prevalence, are crucial. Effective communication and social mobilization are needed to increase community awareness and utilization of services. To objectively report on the impact of NTPs towards reaching the Millennium Development Goals (MDGs), capacity will need to be built for better surveillance, monitoring and evaluation.

Equally essential is the support for research efforts aiming to increase utilization and acceptance of DOTS to reach poor and vulnerable populations, to ensure gender equity, and to develop an evidence base for new policies, particularly in the context of health sector reform in several Member countries.
While most countries are benefiting from the increased resources made available through international initiatives (such as GFATM and GDF) and bilateral agreements at the country level, concerns remain regarding disbursement and long-term financing of TB control. Regional and national level coordination and collaboration are essential for optimal planning, implementation and evaluation of utilization of current resources and for ensuring sustained and adequate financing in the longer term.

With continued commitment and sustained domestic and external funding to augment national capacities to implement TB services within strengthened health systems in the coming years, countries in the Region could well be expected to achieve the TB targets set under the MDGs.
This chapter reviews the progress made in TB control in Member countries of the Region. It provides an analysis of the compiled country reports submitted by NTPs in 2006 on the numbers of cases registered in 2005 and reporting on the treatment outcomes of patients registered in 2004. Only the data from Nepal cover different periods – 16 July 2004 to 15 July 2005 for case detection and 16 July 2003 to 15 July 2004 for treatment outcomes.

2.1 DOTS coverage

DOTS coverage – defined as the population living in administrative areas where DOTS services are available – achieved was 93% in 2005 and approached 98% by March 2006 (when India achieved nationwide coverage). Further expansion of DOTS services will be measured in terms of ease of access to diagnostic and treatment services at the community level.

Figure 1 shows the DOTS case-detection rate among new smear-positive cases in the Region in relation to the population covered. The increase in case-detection has been substantial, particularly in recent years.

2.2 Trends in case notifications and case detection

Of all cases notified worldwide to WHO in 2004, 36% occurred in the SEA Region (Figure 2). In 2005, more than half (51%) of new cases registered in DOTS areas were smear-positive, reflecting a continued focus on quality smear
microscopy. In non-DOTS areas, on the other hand, only 21% of the new cases were reported as smear-positive. Non-DOTS cases were only reported by India and Sri Lanka. Their numbers are negligible compared to the number of cases reported from DOTS areas.

Figure 1: Relationship between case-detection and population coverage
SEA Region, 1997-2005

Figure 2: All notified new and relapse cases
WHO Regions, 2004
There has been a gradual upward trend in overall notification rates for all forms and smear-positive cases of TB in recent years (Figure 3).

Case detection under DOTS also further increased to reach 64% in 2005 for new smear-positive, surpassing the global case-detection rate (Figure 4). High-burden countries, particularly India and Indonesia, dominate these regional
Progress was made in most countries with significant increase in cases notifications in Bangladesh, Indonesia, Myanmar and Sri Lanka. However, uncertainties around trends in case-detection rates remain since these are based on best estimates of the numbers of new cases expected to be found. The increase in case-detection rates definitely indicates better case finding and reporting but may also reflect a true increase in cases in some areas with a higher incidence of HIV. Once programmes have detected the back-log of prevalent cases, a further increase in case detection will become increasingly difficult to demonstrate. Case-detection rates may even show a decreasing trend as in Maldives. It is essential, therefore, to obtain better estimates of the disease burden. Most Member countries have initiated or plan to undertake infection or disease prevalence surveys.

2.3 Case notifications

In 2005, a total of 1 939 356 cases or 117 cases per 100 000 people were reported in the SEA Region. Of these, 854 046 or 52 per 100 000 were classified as new smear-positive. The absolute number of cases in the various categories is shown in Table 1.

Table 1: TB notifications in Member countries of SEA Region in 2005

<table>
<thead>
<tr>
<th>Country</th>
<th>Estimates</th>
<th>Case Notifications</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All new and relapsed</td>
<td>New smear-positive</td>
</tr>
<tr>
<td>High-burden countries</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bangladesh</td>
<td>319252</td>
<td>143637</td>
</tr>
<tr>
<td>India</td>
<td>1824395</td>
<td>814570</td>
</tr>
<tr>
<td>Indonesia</td>
<td>539189</td>
<td>242570</td>
</tr>
<tr>
<td>Myanmar</td>
<td>85464</td>
<td>38050</td>
</tr>
<tr>
<td>Thailand</td>
<td>90607</td>
<td>40249</td>
</tr>
<tr>
<td>Intermediate- and low-burden countries</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bhutan</td>
<td>719</td>
<td>323</td>
</tr>
<tr>
<td>DPR Korea</td>
<td>39793</td>
<td>17907</td>
</tr>
<tr>
<td>Maldives</td>
<td>157</td>
<td>71</td>
</tr>
<tr>
<td>Nepal</td>
<td>48834</td>
<td>21868</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>12445</td>
<td>5597</td>
</tr>
<tr>
<td>Timor-leste</td>
<td>4927</td>
<td>2215</td>
</tr>
<tr>
<td>SEA Region</td>
<td>2965782</td>
<td>1327057</td>
</tr>
</tbody>
</table>
Five of the 22 countries with the highest burden of TB namely, Bangladesh, India, Indonesia, Myanmar and Thailand, together, notified 1,840,423 cases or 95% of all cases notified in the Region (Figure 5). India alone accounted for two thirds of all notifications in the Region and continues to account for almost one fifth of the global burden of TB.

Figure 5: Distribution of all notified TB cases
SEA Region, 2005

Figure 6 shows the notification rates for all forms and new smear-positive cases of TB per 100,000 population in the countries in the Region. Timor-Leste
had the highest notification rates per 100 000 population for all forms of TB as well as for smear-positive cases of TB. Myanmar reported more than 200 TB cases per 100 000 population (all forms). Bhutan and DPR Korea reported between 150 and 200 TB cases while India, Indonesia and Nepal notified cases in excess of 100 per 100 000 population. Maldives reported the lowest notification rates among all the countries in the Region.

New smear-positive cases

The distribution of the 851,981 new smear-positive cases reported under DOTS is as follows: India 59%; Indonesia 19%; Bangladesh 10%; Myanmar 4%; Thailand 3%; DPR Korea 2% and Nepal 1.5% of all cases, while the other four countries accounted for the remaining cases.

Positivity rate

The smear-positivity rate (i.e. the number of smear-positive cases of all forms of TB cases notified) has further increased to 51%, showing that programmes continue to focus on smear microscopy as the primary modality for diagnosis (Figure 7). Positivity rates above 50% were reported from Bangladesh, Indonesia, Maldives, Sri Lanka and Thailand, whereas the positivity rate in non-DOTS areas (only reported by India and Sri Lanka) was 21%.
Pulmonary smear-negative and extra-pulmonary cases

New smear-negative pulmonary cases represented 35% of all cases notified while extra-pulmonary cases represented 14%. Thailand reported the highest percentage (57%) of smear-negative cases while Bhutan reported the highest proportion (40%) of extra-pulmonary cases.

Relapse and retreatment cases

Relapse cases were reported by all countries. Bangladesh, Indonesia and Thailand did not report on the other retreatment categories (i.e. treatment after failure, treatment after default or other retreatments). These cases were also not included in the cohort reports on treatment outcomes from Indonesia and Thailand. The reporting formats currently being developed by the WHO task force on recording and reporting are aimed at capturing this information through routine quarterly reports.

Relapses constituted almost five per cent of all notified cases whereas the remaining three retreatment categories accounted for 13% of all notifications. The figure would have been higher if these retreatment cases had also been reported from Bangladesh, Indonesia and Thailand.

Figure 8 gives an overview of the different categories of TB cases notified under DOTS in the Region.
**Age and sex distribution**

Data by age and sex group were available only for new smear-positive cases. The overall male–female ratio among new smear-positive cases registered in 2005 was 2:1 in the Region as a whole. This was similar to the ratio in previous years. When comparing the male–female ratio in the different age-groups (Figure 9) twice as many girls than boys were detected in the age-group 0–14 years, whereas almost four times as many men as women were detected in the oldest age-groups.

![Figure 9: M–F ratio among new smear-positive cases as per age group
SEA Region, 2005 notifications](image)

Exactly 80% of TB cases were found to be between 15 and 54 years of age, which constitute the socially and economically most active sections of society, with a peaking of cases in the age-group 25–34 years. Among women, however, the peak occurred earlier, between 15 and 34 years (Figure 10).

**2.4 Treatment outcomes**

**Treatment results among new smear-positive cases**

The treatment success rate for patients registered under DOTS in the 2004 cohort was 87%. This was an improvement over previous years and showed that the quality of programme implementation was not compromised while further expanding services. The cure rate was 83% (Figure 11).
Three countries – DPR Korea, Maldives and Sri Lanka achieved both global targets of 70% case detection and 85% treatment success. Bangladesh, India, Indonesia and Nepal further progressed towards the case-detection target while maintaining cure rates above 85%. Bhutan and Myanmar had case-detection rates above the global targets with good treatment outcomes.
The reported rates for mortality, failure, default and patients not evaluated (including transfer-out) were 4%, 2%, 6% and 2%, respectively. The highest mortality rate was reported from Thailand (8%) and was attributed to both the impact of HIV as well as to the ageing population. This was, however, lower than the mortality reported last year. No outcomes were available for more than 10% of patients registered for treatment in Bhutan and Thailand. Figure 12 shows the treatment outcomes among new smear-positive cases in the Member countries in the Region.

 Treatment results among retreatment smear-positive cases

A total of 225,545 retreatment cases were notified in 2004. These included relapses, treatments after failure with first-line drugs, treatments after default and other retreatments. These patients were all treated with the Category II retreatment regimens. Multidrug-resistant cases treated with second-line anti-TB drugs and managed through DOTS-Plus projects were not included among these cases.

For the cohort of patients registered in 2004, 74% of the retreatment cases were successfully treated (Figure 11), slightly better than in previous years. The cure rate was 52% while the completion rate was 22%. Unfavourable outcomes accounted for 26% of the treatment results; one quarter of these patients died,
one fifth remained smear-positive at the end of treatment and more than half of these had defaulted.

Treatment success rates varied by patient category among retreatment cases. Relapses had the best prognosis among all retreatment cases. The treatment success rates were 76%, 63%, 70% and 80% for relapses, treatment after failure, treatment after default and other retreatments, respectively. The true extent of failures of Category II regimens that are multidrug-resistant needs to be validated in countries in this Region.

Treatment outcomes among retreatment cases in Bangladesh, Bhutan, Indonesia, Maldives and Timor-Leste reported success rates above 80% (Figure 13). India showed a significant number of “other” retreatment cases of whom most had completed the treatment without documentation of cure. This explains the dip in the regional cure rate.

![Figure 13: Treatment outcome in retreatment smear-positive cases](SEA Region, 2004 cohort)

Treatment results of new smear-negative and extra-pulmonary cases

The treatment results for new smear-negative cases registered in 2004 were reported by all countries except Bangladesh and Timor-Leste. Of the 537 875 cases registered in 2004, 461 863 or 86% completed treatment. The mortality
and default rate was each 4% while treatment failure was reported in one percent of these patients.

The reporting format included for the first time treatment outcomes for new extra-pulmonary cases. Six countries could report on treatment outcomes on this category of patients. In 2004, 161,268 patients with extra-pulmonary disease were reported in the following countries: Bhutan, DPR Korea, India, Maldives, Nepal and Sri Lanka. Of these, 92% completed treatment, 5% defaulted and 2% died.

2.5 Overall progress towards case detection and treatment success

As both case detection and treatment success are further improving in most Member countries, the Region is progressing steadily towards reaching the set 70% and 85% targets as shown in Figure 14.

![Figure 14: Trends in case-detection and treatment success rates SEA Region, 1997-2005](image)

2.6 Tuberculosis and HIV

Approximately, 6.26 million persons in the SEA Region are estimated to be infected with HIV in 2005 (Table 2). Approximately two thirds of these persons
Tuberculosis Control in the South-East Asia Region

are in India, were an estimated 5.2 million people in the age-group 15–49 years were living with HIV in 2005, as estimated by the Indian National AIDS Control Organization.

The HIV epidemic is in different stages in each country. In Thailand and four southern states of India, the HIV prevalence appears to be decreasing slowly. In other countries, such as Bangladesh and Indonesia, increasing HIV prevalence among high-risk groups has raised concerns around the potential for the HIV epidemic to become generalized. Given the large numbers of HIV-infected persons and high rates of TB transmission and latent TB infection, HIV-related TB is a major concern for the Region. HIV is also beginning to have a substantial negative impact on TB control in the Region. This is already recognized in Thailand and Myanmar, where trends towards younger age-groups being affected and higher case-fatality rates are seen in areas with higher prevalence of HIV.

WHO estimated that in 2004, over 77 000 TB cases were co-infected with HIV, approximately 5% of all TB cases in the Region (Table 3). This proportion, however, varies substantially between countries and within countries, reflecting the heterogeneous distribution of HIV prevalence. Several countries are now embarking on regular surveillance for HIV infection among TB patients and more precise data will be available in the coming years.

### Table 2: Estimated number of HIV-infected adults and children and HIV seroprevalence among adults (2005)

<table>
<thead>
<tr>
<th>Country</th>
<th>Estimated number of HIV-infected adults and children</th>
<th>Estimated HIV seroprevalence among adults (15-49 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>7 500</td>
<td>&lt; 0.1%</td>
</tr>
<tr>
<td>Bhutan</td>
<td>&lt; 500</td>
<td>&lt; 0.1%</td>
</tr>
<tr>
<td>DPR Korea</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>India</td>
<td>5 200 000</td>
<td>0.9%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>110 000</td>
<td>0.1%</td>
</tr>
<tr>
<td>Maldives</td>
<td>&lt; 100</td>
<td>&lt; 0.1%</td>
</tr>
<tr>
<td>Myanmar</td>
<td>331 000</td>
<td>1.3%</td>
</tr>
<tr>
<td>Nepal</td>
<td>70 253</td>
<td>0.6%</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>5 000</td>
<td>&lt; 0.1%</td>
</tr>
<tr>
<td>Thailand</td>
<td>541 000</td>
<td>1.5%</td>
</tr>
<tr>
<td>Timor-Leste</td>
<td>&lt; 100</td>
<td>&lt; 0.1%</td>
</tr>
</tbody>
</table>

Source: National HIV/AIDS control programmes, Ministries of Health
2.7 Anti-TB drug-resistance

The burden of anti-TB drug resistance in the Region is not well described as prior to 2006 few countries had completed population-based drug-resistance surveys. While reports from individual tertiary-care facilities have reported high levels of observed drug resistance, these estimates are generally not reliable. From available survey data, the prevalence of MDR-TB among new cases in the Region is estimated to be 2.2%. Among previously treated cases the prevalence of MDR-TB was estimated to be 14.9% (Table 4). The total number of cases of MDR-TB in the Region has been estimated at 114,967 cases, of whom approximately 76% were in India. Drug-resistance surveys are expected to commence in Bangladesh, Indonesia, Sri Lanka and in eight additional states in India in 2006. No data on the magnitude of drug resistance to second-line anti-TB drugs are available from the Region.

### Table 3: Estimated number and prevalence of HIV infection among tuberculosis cases (2004)

<table>
<thead>
<tr>
<th>Country</th>
<th>Estimated HIV seroprevalence among TB cases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
</tr>
<tr>
<td><strong>Countries with generalized HIV epidemic</strong></td>
<td></td>
</tr>
<tr>
<td>Myanmar</td>
<td>4,089</td>
</tr>
<tr>
<td>Thailand</td>
<td>5,241</td>
</tr>
<tr>
<td><strong>Countries with concentrated HIV epidemic</strong></td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>64,080</td>
</tr>
<tr>
<td>Indonesia</td>
<td>3,198</td>
</tr>
<tr>
<td><strong>Countries with low-level HIV epidemic</strong></td>
<td></td>
</tr>
<tr>
<td>Bangladesh</td>
<td>263</td>
</tr>
<tr>
<td>Bhutan</td>
<td>&lt;10</td>
</tr>
<tr>
<td>DPR Korea</td>
<td>&lt;10</td>
</tr>
<tr>
<td>Maldives</td>
<td>&lt;10</td>
</tr>
<tr>
<td>Nepal</td>
<td>1,070</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>30</td>
</tr>
<tr>
<td>Timor-Leste</td>
<td>19</td>
</tr>
<tr>
<td><strong>SEA Region</strong></td>
<td>77,992</td>
</tr>
</tbody>
</table>

Source: WHO
The first priority remains prevention of acquired drug resistance through effective implementation of DOTS. However, national TB programmes are faced with the challenge of a growing pool of patients with MDR-TB. There is an equally urgent need to build the capacity of national laboratories to diagnose patients with MDR-TB. Currently, TB patients with drug-resistant forms of TB are treated largely at tertiary hospitals and by the private sector. India and Nepal have established DOTS-Plus projects to treat patients with drug-resistant TB according to international guidelines, in close consultation with the Green Light Committee under programme conditions and have plans to scale up facilities to treat MDR-TB cases in 2006-07. DOTS-Plus projects have also been planned in Bangladesh, Bhutan, Myanmar, Sri Lanka and Timor-Leste.

Table 4: Estimated number and prevalence of MDR-TB in the SEA Region in 2004 among new cases and retreatment cases

<table>
<thead>
<tr>
<th>Country</th>
<th>MDR-TB in new cases</th>
<th>MDR-TB in retreatment cases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percentage</td>
</tr>
<tr>
<td><strong>Countries with anti-TB drug resistance surveys</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>44 653</td>
<td>2.4%</td>
</tr>
<tr>
<td>Myanmar</td>
<td>3 759</td>
<td>4.4%</td>
</tr>
<tr>
<td>Nepal</td>
<td>647</td>
<td>1.3%</td>
</tr>
<tr>
<td>Thailand</td>
<td>843</td>
<td>0.9%</td>
</tr>
<tr>
<td><strong>Countries without anti-TB drug resistance surveys</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bangladesh</td>
<td>5 699</td>
<td>1.8%</td>
</tr>
<tr>
<td>Bhutan</td>
<td>41</td>
<td>1.8%</td>
</tr>
<tr>
<td>DPR Korea</td>
<td>1 132</td>
<td>2.8%</td>
</tr>
<tr>
<td>India</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Indonesia</td>
<td>8 429</td>
<td>1.6%</td>
</tr>
<tr>
<td>Maldives</td>
<td>2</td>
<td>1.5%</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>211</td>
<td>1.7%</td>
</tr>
<tr>
<td>Timor-Leste</td>
<td>79</td>
<td>1.6%</td>
</tr>
<tr>
<td><strong>Total Region</strong></td>
<td><strong>114 967</strong></td>
<td><strong>3.5%</strong></td>
</tr>
</tbody>
</table>


The first priority remains prevention of acquired drug resistance through effective implementation of DOTS. However, national TB programmes are faced with the challenge of a growing pool of patients with MDR-TB. There is an equally urgent need to build the capacity of national laboratories to diagnose patients with MDR-TB. Currently, TB patients with drug-resistant forms of TB are treated largely at tertiary hospitals and by the private sector. India and Nepal have established DOTS-Plus projects to treat patients with drug-resistant TB according to international guidelines, in close consultation with the Green Light Committee under programme conditions and have plans to scale up facilities to treat MDR-TB cases in 2006-07. DOTS-Plus projects have also been planned in Bangladesh, Bhutan, Myanmar, Sri Lanka and Timor-Leste.
3.1 Advocacy and planning

WHO has continued to focus the attention of policy makers on issues related to better implementation TB control in the Region. The new Stop TB strategy and Regional Strategic Plan for TB Control 2006-15 were agenda items during the Health Secretaries’ Meeting, held at New Delhi in June 2006. The health secretaries committed to supporting further strengthening of DOTS and the implementation of additional interventions included under the new strategy through country-specific planning towards achieving TB targets under the MDGs. They committed to develop or review and update multi-year country-specific TB strategic plans based on the Regional Strategic Plan.

Several Member countries received assistance in preparing operational plans for the next two- or three-year periods for activities supported by the Global Fund and in Myanmar through the proposed 3-Disease Fund established by a consortium of six donors. The Regional and country offices of WHO also contributed to the development of the medium term strategic plan covering the period 2008-13. Under this new planning framework, TB control is grouped together with HIV/AIDS and malaria under one of the 16 strategic objectives. This is a departure from the earlier programme planning where each programme was placed under one area of work. The reduction of the 32 areas of work to 16 strategic objectives will increase focus on core issues and promote collaboration with other programmes. Planning for the next WHO biennial work plan (2008-09) was also initiated. Tuberculosis is no longer a separate...
area of work but is integrated in the strategic objective on HIV/AIDS, TB and malaria control.

### 3.2 Coordination and collaboration

The 11th Meeting of the National Tuberculosis Programme Managers and the 4th Meeting of the SEA Region Technical Working Group on TB were held in Kathmandu, Nepal between 5 and 9 December 2005. These annual meetings continued to provide a very useful forum for exchange of information and sharing of experiences with Member countries. The Regional Strategic Plan on TB (2006-15) was formally endorsed during this meeting. The future steps to operationalize this strategy in Member countries through multi-year national TB control plans were also reviewed and agreed upon during these meetings.

The Regional and country offices of WHO contributed to the work of the global working groups and/or task forces on public–private mix for DOTS (PPM-DOTS), community-based TB care, TB/HIV and revised recording and reporting.

WHO also contributed to the multi-country and country activities organized by partner organizations, the Union’s Global Conference on Lung Health (Paris, October 2005); the EU Asia Stakeholders’ Consultation on AIDS as well as Malaria and Tuberculosis (New Delhi, April 2006), the 6th Joint Annual Conference of the Indian Society for Malaria and Other Communicable Diseases and the Indian Association of Epidemiologists (Agra, February 2006).

The collaboration of the WHO Regional Office for South-East Asia with the WHO Regional Office for the Western Pacific Region was further strengthened, following the publication of the first bi-regional report on TB control in 2005. The Second Intercountry Training on TB/HIV, organized by the Regional Office for South-East Asia from 21 to 28 February 2006 in Bangkok, Thailand included also participants from China, Lao People’s Democratic Republic, Malaysia and Viet Nam. The TB Laboratory Training Course for Asia-Pacific was organized by WPRO in Beijing, China from 9-12 October 2006 and included participants from Bangladesh, Bhutan, DPR Korea, Indonesia, Myanmar, Nepal, Sri Lanka and Thailand. Maldives was invited as an observer to the 3rd Stop TB Meeting in the Pacific Islands, held in Nouméa, New Caledonia from 29 July to 4 August. Staff of Timor-Leste will attend a training on MDR-TB case management in Makati Medical Centre, Manila, Philippines. The two Regions also worked closely together in providing technical assistance through a shared roster of local experts.
3.3 Technical support

The Regional and country offices of WHO were enabled to augment technical support to countries through increased staffing at both the Regional Office and at some country offices. WHO staff continued to work closely with partners to provide technical assistance to all Member countries as required. Table 5 shows the distribution of WHO staff in the Region. In addition, support was provided through special services agreements (SSAs) and a network of national consultants in Bangladesh, India, Indonesia and Myanmar. The latter support specific sub-components of the programme or national programme staff at intermediate and district levels within the countries. The mechanism of horizontal collaboration also facilitates technical support by WHO staff based in larger countries to countries without in-country technical staff.

Table 5: WHO TB programme staff in the Region

<table>
<thead>
<tr>
<th>Country</th>
<th>MO/APO/TO (TB)</th>
<th>NPO (TB)</th>
<th>STP/STE (TB)</th>
<th>MO/NPO (CDS)</th>
<th>SSA and consultants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>1</td>
<td>2</td>
<td>–</td>
<td>–</td>
<td>14*</td>
</tr>
<tr>
<td>DPR Korea</td>
<td>–</td>
<td>1</td>
<td>–</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>India</td>
<td>1.5</td>
<td>2</td>
<td>3</td>
<td>–</td>
<td>121</td>
</tr>
<tr>
<td>Indonesia</td>
<td>3*</td>
<td>1</td>
<td>–</td>
<td>–</td>
<td>10</td>
</tr>
<tr>
<td>Myanmar</td>
<td>2</td>
<td>–</td>
<td>2</td>
<td>–</td>
<td>4</td>
</tr>
<tr>
<td>Nepal</td>
<td>–</td>
<td>–</td>
<td>1</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>Thailand</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>Timor-Leste</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>SEA Region</td>
<td>2.5</td>
<td>–</td>
<td>2</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>6</td>
<td>8</td>
<td>4</td>
<td>149</td>
</tr>
</tbody>
</table>

*including vacant posts

MO = medical officer; APO = associate professional officer; TO = technical officer; NPO = national professional officer; STP = short-term professional; STE = short-term employee

Technical support missions were sent to countries to provide assistance in updating national manuals and guidelines (Bhutan, Maldives, Myanmar, Sri Lanka and Timor-Leste) for establishing and expanding laboratory services (DPR Korea, Myanmar), quality assurance, culture, drug-susceptibility testing (DST), surveillance (Bangladesh, DPR Korea, India, Indonesia, Myanmar and Timor-Leste) as well as drug procurement and logistics, through GDF missions to several countries. Bhutan, Nepal, Sri Lanka and Thailand were provided assistance in preparing GFATM proposals during Round 6. External missions to
review progress were held in Bhutan, Timor-Leste and India during the course of the year. Missions to review progress with public–private partnerships for TB services were held in Bangladesh and Thailand. National workshops and trainings were supported in a number of countries.

Staff from WHO headquarters, GDF, the Green Light Committee as well as technical agencies and independent consultants also provided technical support for various in-country missions.

### 3.4 Capacity building

In addition to the two bi-regional trainings on TB/HIV and laboratory services, two workshops were organized by the Regional Office for South-East Asia. An informal consultation on laboratory strengthening took place in Chennai, India from 11 to 13 July 2006. Elements were identified for action by WHO, technical partners, national and supranational reference laboratories and experts supporting laboratories in the Region to expand crucial laboratory services, including quality assurance for sputum smear microscopy and to introduce culture and drug-sensitivity testing to support case management of drug-resistant TB and for drug-resistance surveillance. The supranational reference laboratories that would be linked to each of the national reference laboratories for technical advice and external quality assurance (EQA) were also identified.

A workshop on improving TB surveillance and monitoring took place from 28 to 31 August 2006 in Bangalore, India. The current status of TB surveillance and monitoring in countries in the Region were reviewed and the modalities and plans for strengthening routine programme surveillance, complemented by appropriate population-based surveys to better monitor trends in TB incidence, prevalence and mortality, were discussed.

A training course was also organized by the Regional Office to inform countries intending to apply for Round 6 of GFATM on the specific requirements and procedures for the Global Fund. As a technical agency WHO also advised on the most appropriate, effective and cost-effective elements to include in these proposals.

Information sharing was also supported through the publication and dissemination of various technical, training and advocacy materials. These included the Regional Strategic Plan 2006-15, generic guidelines for conducting ARTI surveys, modules on leadership and strategic management, mission reports, World TB Day kit 2006 and articles in peer-reviewed journals.
3.5 Resource mobilization

Assistance was provided to Member countries in mobilizing additional external resources for TB control. WHO staff as well as consultants identified through the Regional Office assisted countries in preparing applications to GFATM, GDF and bilateral donors, including CIDA, USAID, the Asian Development Bank, the World Bank and Fidelis, among others. Support was also provided to Myanmar for preparing an operational plan to be funded through the 3-Disease Fund, established by a consortium of six donors with the aim of supporting the HIV/AIDS, TB and malaria programmes over a five-year period.

The GFATM remained the single largest funding agency in the Region (Table 6). Ten countries requested funding for US$ 357 790 485 for projects over a timeframe of five years. Of this, US$ 228 319 453 was approved for disbursement. Most of the distributed funds covered phases one and two of grants approved during Rounds 1 and 2. US$ 95 215 191 had been disbursed until the time of writing this report. This represents 42% of the approved amount and 27% of the requested amount.

<table>
<thead>
<tr>
<th>Country</th>
<th>Round</th>
<th>Programme Start Date</th>
<th>Total requested</th>
<th>Approved</th>
<th>Disbursed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>3</td>
<td>01 Aug 04</td>
<td>42 466 735</td>
<td>42 466 735</td>
<td>19 809 970</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>01 May 05</td>
<td>45 637 671</td>
<td>9 664 425</td>
<td>2 957 397</td>
</tr>
<tr>
<td>Bhutan</td>
<td>4</td>
<td>01 Apr 05</td>
<td>994 298</td>
<td>560 568</td>
<td>503 954</td>
</tr>
<tr>
<td>DPR Korea</td>
<td>1</td>
<td>01 Apr 05</td>
<td>4 900 000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>India</td>
<td>1</td>
<td>01 Apr 03</td>
<td>8 655 033</td>
<td>8 655 033</td>
<td>7 228 840</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>01 Apr 04</td>
<td>29 100 000</td>
<td>29 100 000</td>
<td>6 758 686</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>01 Nov 04</td>
<td>14 819 772</td>
<td>14 819 772</td>
<td>2 185 472</td>
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<tr>
<td></td>
<td>4</td>
<td>01 Apr 05</td>
<td>26 545 000</td>
<td>6 819 000</td>
<td>3 989 923</td>
</tr>
<tr>
<td>Indonesia</td>
<td>1</td>
<td>01 Aug 03</td>
<td>68 769 224</td>
<td>68 769 224</td>
<td>38 429 197</td>
</tr>
<tr>
<td></td>
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<td>01 Aug 03</td>
<td>69 434 776</td>
<td>18 587 491</td>
<td>0</td>
</tr>
<tr>
<td>Myanmar</td>
<td>2</td>
<td>01 Jan 05</td>
<td>17 121 370</td>
<td>2 735 234</td>
<td>2 735 234</td>
</tr>
<tr>
<td>Nepal</td>
<td>4</td>
<td>01 Nov 05</td>
<td>10 126 706</td>
<td>3 354 080</td>
<td>633 000</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>1</td>
<td>01 Mar 03</td>
<td>5 465 034</td>
<td>5 465 034</td>
<td>2 454 137</td>
</tr>
<tr>
<td>Thailand</td>
<td>1</td>
<td>01 Oct 03</td>
<td>11 455 207</td>
<td>11 455 207</td>
<td>6 871 528</td>
</tr>
<tr>
<td>Timor-Leste</td>
<td>3</td>
<td>01 Mar 05</td>
<td>2 299 659</td>
<td>967 650</td>
<td>657 853</td>
</tr>
<tr>
<td><strong>Total all Rounds</strong></td>
<td></td>
<td></td>
<td><strong>357 790 485</strong></td>
<td><strong>228 319 453</strong></td>
<td><strong>95 215 191</strong></td>
</tr>
</tbody>
</table>

Source: www.theglobalfund.org, accessed on 24 October 2006
A resource mobilization workshop was held in New Delhi on 7 and 8 March 2006 and a regional resource mobilization framework developed.

Funding gaps for activities to be carried out by most national TB programmes are minimal in the short term with the exception of DPR Korea and Myanmar. However, funding for the Regional and country offices of WHO were only partially addressed through voluntary contributions channelled through WHO headquarters and from other donors supporting country level activities.

3.6 Operational research

In collaboration with the Unicef-UNDP-World Bank-WHO Special Programme for Research and Training in Tropical Diseases (TDR) and the three regional WHO collaborating centres (Tuberculosis Research Centre, Chennai; National Tuberculosis Institute, Bangalore; and SAARC Tuberculosis and HIV/AIDS Centre, Kathmandu), support was provided to undertake specific research activities, reflecting programme priorities in Member countries. The TDR small-grant scheme not only promotes country-driven operational research but also aims at building capacity for undertaking operational research in Member countries. Besides this, several operational research projects, such as laboratory techniques and procedures; quality assurance; knowledge, attitude, behaviour and practice studies; epidemiological surveys; health systems reform; and interventions to address TB/HIV and drug-resistant TB are in progress in several countries in the Region.
Country Profiles
Tuberculosis Control in the South-East Asia Region
Bangladesh ranks sixth on the global list of 22 countries with the highest burden of TB. The current estimates for the incidence and prevalence of TB are based on prevalence surveys done in 1964 and 1988 and limited surveys conducted during the past five years. A prevalence survey combined with an ARTI survey is in progress, jointly undertaken with the International Centre for Diarrhoeal Disease and Research, Bangladesh. The prevalence of HIV in the country is low and largely limited to high-risk population groups, namely commercial sex workers and injecting drug users. Representative data on TB/HIV co-morbidity are not available. National data on the levels of anti-TB drug resistance is similarly lacking.

Control of TB is a priority under the Health, Nutrition and Population Sector Programme of the Ministry of Health and Family Welfare. Bangladesh has made commendable progress in implementing DOTS. The DOTS strategy, adopted in 1993, has steadily expanded to cover 99% of the country’s population by 2005. During 2005 the case-detection rate among new smear-positive patients rose to 59% from 41% reported in 2004. The treatment success rate among patients registered in 2004 similarly rose to 90% from 85% in 2003.

Since the inception of the DOTS, 11 major NGOs have helped in implementing TB services under Memoranda of Understanding with the Government. The involvement of private institutions and practitioners as well as employers in the export promotion zones and medical colleges in TB control increased further. Plans have also been developed to introduce TB control
services in prison populations and among refugees. The special focus on ensuring access to services for women continued through engaging female community volunteers. Additional staff recruited at the national and divisional levels to support programme implementation and regular supervision has contributed to further improving the quality of programme implementation.

Recognizing the need to increase access to laboratory services, additional microscopy centres were set up in cities as well as in large upazilas (sub-districts). The laboratory external quality assurance programme was expanded to cover the entire country including urban areas. A protocol for the management of MDR-TB cases under programme conditions was developed and has been approved by the Green Light Committee.

An application to the GFATM Round 5 resulted in an additional five-year grant of US$ 46 million. Support from GDF has continued with the delivery of the third year’s supply of drugs under a three-year grant as well as through the direct procurement mechanism. CIDA, USAID and the World Bank continued to provide funding. Technical assistance is being provided by WHO and key partners including the KNCV Tuberculosis Foundation, the Research Institute for Tuberculosis, Japan and the Union.

Key achievements

- Under the Intensified Support and Action Countries (ISAC) initiative, focal points for human resource development (HRD) and PPM DOTS were assigned at the central level and full-time TB staff were recruited at the national, district and upazila levels.

- Community volunteers, village doctors and other community members were oriented in identifying and referring TB suspects. Direct supervision of the treatment conducted by them also contributed to the success of the TB services.

- Regular supervision and monitoring of DOTS was conducted by central, divisional and district level supervisors.

- A Bangla version of the Laboratory and Quality Control Manual was developed and distributed throughout the national laboratory network.

- Quality assurance of sputum-smear microscopy was institutionalized through the establishment of 28 EQA centres and regular on-site supervision.
Specific plans were developed for TB control among prisoners and refugees.

PPM guidelines were developed and approved by the Ministry of Health and Family Welfare.

Final draft of the operational guidelines for advocacy, communication and social mobilization (ACSM) was prepared.

Draft operational guidelines for the management of MDR-TB were prepared.

**Challenges and constraints**

- Inadequate storage facilities (both in central and peripheral level) and weak inventory management for drugs and supplies.
- Lack of culture and DST facilities with the NTP.
- Inadequate involvement and insufficient coordination of activities implemented jointly with private practitioners.
- Linkages between TB and HIV programme yet to be established.
- HRD plan for TB not linked to or coordinated with national HR plans for the entire health sector.
- Difficulties in strictly adhering to the rigid funding and reporting deadlines set by the Global Fund.

**Planned activities**

- Conduct of a population-based disease prevalence survey.
- Expansion of PPM DOTS activities with proper coordination and collaboration among the stakeholders.
- Introduction of comprehensive ACSM activities.
- Establishing of formal linkages with the HIV programme for planning and implementation of joint activities.
- Strengthening the procurement and supplies management system.
- Establishment of new National Reference Laboratory for culture and DST.
- Setting up of DOTS-Plus initiatives for the management of MDR-TB cases.
### Tuberculosis Control in the South-East Asia Region

#### Progress in population coverage and DOTS case detection

- Population: 141,821,000
- Incidence:
  - All cases: 319,252
  - All cases (per 100k/year): 229
  - New ss+: 143,637
  - New ss+ (per 100k/year): 103
- Prevalence rate (per 100k): 435
- TB mortality (all cases per 100k/year): 51

#### Trends

<table>
<thead>
<tr>
<th>Year</th>
<th>00</th>
<th>01</th>
<th>02</th>
<th>03</th>
<th>04</th>
<th>05</th>
</tr>
</thead>
<tbody>
<tr>
<td>All cases (per 100k)</td>
<td>55</td>
<td>54</td>
<td>57</td>
<td>60</td>
<td>71</td>
<td>87</td>
</tr>
<tr>
<td>New ss+ (per 100k)</td>
<td>28</td>
<td>29</td>
<td>33</td>
<td>37</td>
<td>45</td>
<td>60</td>
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<td>DOTS case-detection rate</td>
<td></td>
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<tr>
<td>New ss+ (%)</td>
<td>23</td>
<td>25</td>
<td>29</td>
<td>33</td>
<td>41</td>
<td>59</td>
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<tr>
<td>Treatment success (DOTS, ss+, %)</td>
<td>83</td>
<td>84</td>
<td>84</td>
<td>85</td>
<td>90</td>
<td>–</td>
</tr>
</tbody>
</table>

#### 2005 Case notification by type of patient

- Total notified: 124,210

- New ss+: 24,680 (19%)
- New ss+: 3,010 (2%)
- New FP: 11,290 (9%)
- Relapse: 95 (0%)
- Treatment after failure: 9 (0%)
- Treatment after default: 2 (0%)
- Other retreatment: 2,730 (2%)

#### TB notification rates, 1995-2005

- Cases per 100,000 population:
  - 1995: 6
  - 1996: 9
  - 1997: 11
  - 1998: 13
  - 1999: 15
  - 2000: 17
  - 2001: 19
  - 2002: 21
  - 2003: 23
  - 2004: 25
  - 2005: 27

- Cases per 100,000 population:
  - 1995: 6
  - 1996: 9
  - 1997: 11
  - 1998: 13
  - 1999: 15
  - 2000: 17
  - 2001: 19
  - 2002: 21
  - 2003: 23
  - 2004: 25
  - 2005: 27

- Number of cases:
  - 0-14: 1,200
  - 15-24: 4,800
  - 25-34: 12,000
  - 35-44: 9,000
  - 45-54: 6,000
  - 55-64: 3,000
  - >65: 1,000

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Tuberculosis Control in the South-East Asia Region
Tuberculosis Control in the South-East Asia Region

Tuberculosis Control in the South-East Asia Region

Treatment results new smear-positive, 2004 cohort (n=62 694)

cured 88%
died 4%
failure 1%
defaulted 3%
not evaluated 3%

Progress in DOTS case detection and treatment success

Tuberculosis Control in the South-East Asia Region
Bhutan

Bhutan is among the intermediate TB burden countries in the Region. The current estimates for TB incidence and prevalence are based on a national tuberculin survey conducted in 1991 (where ARTI was taken as 1.5%) and on routine case notifications from the programme. The country is considered to have a very low prevalence of HIV. Representative data on the levels of anti-TB drug resistance in the country are not available.

Following the Housing and Population survey which took place in 2005, the total country population was reported to be 672 000 (including floating population); this figure has been used by the NTP as well as in this document to report on case-detection rates. During 2005 the case-detection rate among new smear-positive patients rose to 95% from 32% reported in 2004 based on the earlier population estimate of 2.1 million. High treatment success rate continued to be maintained.

An external review of the National Tuberculosis Control Programme took place in May 2006. The DOTS programme is firmly in place in all health services including those resorting under different ministries and large employment sectors.

The Public Health Laboratory in Thimphu is the national reference laboratory for TB. A Memorandum of Understanding was signed with the supranational reference laboratory in Gauting, Germany for technical assistance to the national laboratory network in Bhutan. Culture and DST facilities are being strengthened for the diagnosis of drug-resistant TB and to undertake surveys to monitor trends in anti-TB drug resistance.
The current policy of admitting all Category I patients in hospital during the intensive phase of the treatment is being revised. Ambulatory DOTS is planned at the geog and community levels. Introduction of fixed-dose combination drugs will be discussed with the national drug committee to allow for easier logistics and prescribing at peripheral health centres and to improve patient compliance.

The NTP and National AIDS Control Programme have an excellent working relationship with each other. HIV testing among TB patients is undertaken during annual HIV sentinel surveys and voluntary counselling and testing centres are available at the district level where TB cases are also diagnosed.

Bhutan has applied for support to the Global Fund in Round 6 for TB control activities to build on the activities supported through a grant received during Round 4 and to undertake additional interventions for TB/HIV, drug-resistant TB and establish wider community involvement.

Key achievements

- Sustained government commitment provided for the procurement of first-line drugs, laboratory consumables, food for in-patients, etc.
- Quality control was introduced for 30 laboratories in the 30 reporting centres.
- Collaboration was established between NTP and non-NTP service delivery partners including military and large employment sectors.
- The Public Health Laboratory was formally linked to the supranational reference laboratory.
- Annual sentinel surveys for HIV among TB patients were conducted.

Challenges and constraints

- Limited management capacity at the central level.
- Inadequate access to diagnostic and treatment facilities, especially among nomadic people, monks and people living in the border areas.
- Uncertainties regarding the actual burden of TB in the country.
- Limited capacity to diagnose and treat MDR-TB patients according to international standards.
Planned activities

- Computerization of the NTP recording and reporting system.
- Addressing TB control among vulnerable populations, such as prisoners, monks and nuns, migrant workers, nomads, etc.
- Development of culture and DST facilities in the country.
- Establishment of interventions for the management of MDR-TB patients in consultation with the Green Light Committee.
- MDR survey to be conducted in 2007.

<table>
<thead>
<tr>
<th>Estimates</th>
<th></th>
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<tbody>
<tr>
<td>Population</td>
<td>672,425</td>
</tr>
<tr>
<td>Incidence</td>
<td></td>
</tr>
<tr>
<td>All cases</td>
<td>719</td>
</tr>
<tr>
<td>All cases (per 100k/year)</td>
<td>107</td>
</tr>
<tr>
<td>New ss+</td>
<td>323</td>
</tr>
<tr>
<td>New ss+ (per 100k/year)</td>
<td>48</td>
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<tr>
<td>Prevalence rate (per 100k)</td>
<td>184</td>
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<td>TB mortality (all cases per 100k/year)</td>
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<table>
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<tr>
<td>All cases (per 100k)</td>
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<td>49</td>
<td>50</td>
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<td>17</td>
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<tr>
<td>DOTS case-detection rate</td>
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<tr>
<td>New ss+ (%)</td>
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<tr>
<td>Treatment success (DOTS, ss+, %)</td>
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<td>93</td>
<td>86</td>
<td>90</td>
<td>83</td>
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Progress in population coverage and DOTS case detection

TB notification rates, 1995-2005
2005 Case notification by type of patient
Total notified: 1018

- New ss+: 4%
- New ss-: 30%
- New EP: 38%
- Relapse: 27%
- Treatment after failure: 1%
- Treatment after default: 0%
- Other retreatment: 0%

Notification per age-group
new smear-positive cases, 2005

- Male
- Female

2004 cohort (n=375)
- Cured: 78%
- Died: 5%
- Treatment failure: <1%
- Defaulted: 2%
- Not evaluated: 10%

Progress in DOTS case detection and treatment success

- Treatment success rate
- DOTS detection rate

- 1998
- 1999
- 2000
- 2001
- 2002
- 2003
- 2004
- 2005

Tuberculosis Control in the South-East Asia Region
DPR Korea is among the intermediate burden countries in the Region with a case notification rate of 190 per 10,000 population for all forms of TB. Current estimates for the incidence and prevalence of TB are based on previous limited surveys and routine case notifications from the NTP. An ARTI survey was piloted in three districts and reported on in 2005. Based on the experience gained from this pilot study, a nationwide survey is planned. The country has yet no reported case of HIV. Rates of anti-TB drug resistance are unknown, given the limited capacity for culture and DST in the country.

DOTS was introduced in DPR Korea in 1998 and full coverage was achieved by the end of 2003. Case detection rates have remained above 90% since 2003 and treatment success rates in excess of 85% continued to be achieved.

The programme was further decentralized to the community level by involving more ri and dong clinics, the most peripheral health units in the rural and urban areas, respectively. Family doctors were also increasingly involved. External technical support through consultancies was provided to further improve recording and reporting as well as surveillance and to strengthen laboratory services. Standard laboratory kits containing slides and reagents were provided for use at the district level.

The programme benefited from funding support provided by CIDA, the main donor to the TB programme in DPR Korea. The GDF provided drugs during the past three years and has committed to continue the support until
2008. Technical assistance was provided through WHO while the Tuberculosis Research Centre at Chennai supported laboratory services.

**Key achievements**

- DOTS was firmly in place with service delivery extending to the most peripheral level.
- In-country logistics for drugs and consumables were well established.
- Additional staff were trained and supervision was intensified.
- Treatment was decentralized to selected facilities at the sub-district level and involvement of family doctors was institutionalized.
- Standardized laboratory kits were introduced.

**Challenges and constraints**

- Sustainability of financing for the programme is a concern; no additional donors have been identified so far.
- No overarching master plan is available.
- Inadequate capacity for culture and DST at central laboratory.
- Referral centres are not sufficiently equipped.
- Lack of information on TB control activities carried out through other public health systems.
- Management of TB in children appears to be neglected.

**Planned activities**

- Finalization of the five-year strategic plan and work plan indicating resource requirements and gaps.
- Engaging donors and partners to ensure financial sustainability.
- Introduction of culture and DST facilities at the Central TB Institute laboratory.
- Introduction of the new protocol for laboratory quality assurance.
- Improvement of diagnostic facilities at referral centres for detection of smear-negative, extra-pulmonary and childhood TB.
- Link up with other public health providers.
- Conducting a representative ARTI survey for a better estimate of the disease burden.
Tuberculosis Control in the South-East Asia Region

### Progress in population coverage and DOTS case detection

<table>
<thead>
<tr>
<th>Year</th>
<th>DOTS detection rate</th>
<th>Population coverage</th>
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<td>100%</td>
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<tr>
<td>2005</td>
<td>120%</td>
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### TB notification rates, 1997-2005

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<th>Year</th>
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<td>2004</td>
<td>95</td>
</tr>
<tr>
<td>2005</td>
<td>105</td>
</tr>
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</table>

### 2005 Case notification by type of patient

- Total notified: 50 416
- New ss+: 35%
- New ss+: 35%
- New EP: 11%
- Relapse: 10%
- Treatment after failure: 3%
- Treatment after default: 3%
- Other retreatment: 2%

### Notifications per age-group

- new smear-positive cases, 2005

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<th>Age-group (years)</th>
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<td>55-64</td>
<td>3000</td>
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<td>&gt;65</td>
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### Trends

<table>
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<tr>
<th>Year</th>
<th>Notification Rates</th>
<th>DOTS case-detection rate</th>
<th>Treatment success (DOTS, ss+ %)</th>
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<td>89</td>
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<tr>
<td>05</td>
<td>190</td>
<td>99</td>
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</tbody>
</table>
Treatment results new smear-positive, 2004 cohort (n=18,479)

- Cured: 84%
- Completed: 5%
- Died: 2%
- Defaulted: 3%
- Not evaluated: 3%

Progress in DOTS case detection and treatment success

![Graph showing progress in DOTS case detection and treatment success from 1999 to 2005.]
India is the highest TB burden country in the world. The current estimates for the prevalence (for the year 2000) and incidence of TB are derived from recent and on-going prevalence surveys conducted by the National TB Institute, Bangalore and the Tuberculosis Research Centre, Chennai and a nationwide ARTI survey completed in 2003. Mortality surveys, based on verbal autopsy, have been completed in two states in 2006. Over the next five years, additional surveys as well as resurveys are planned to obtain better estimates of disease burden, including incidence, prevalence and TB-related mortality. Routine programme surveillance is also being strengthened, with further improvements in the electronic and reporting system already in place in the country.

In March 2006, India achieved full coverage of DOTS, making services available to a population of 1.1 billion people. A comprehensive five-year strategic plan (2006–11) has been developed. The Revised National TB Control Programme (RNTCP) is moving to implement all the additional components of the new Stop TB strategy into routine programme activity. New guidelines and training modules have been developed to train staff and implement interventions for TB/HIV and manage MDR-TB. Specific activities to address TB/HIV have been scaled up in 14 states. A DOTS-Plus project for the diagnosis and treatment of MDR cases has been implemented in Delhi following approval of the Green Light Committee since mid-2005.

Barring five states which reported generalized epidemics, concentrated HIV epidemics are prevalent in other parts of the country. A round of periodic seroprevalence surveys of HIV amongst TB patients is being conducted in 15
districts starting in late 2006. India has been participating in successive rounds of the global anti-TB drug resistance surveillance. More recently, a drug-resistance survey was completed in two states and plans have been developed to establish a network of 24 quality-assured culture and DST facilities over the next five years to allow for wider drug resistance surveys and to support the management of MDR-TB cases. Treatment of MDR-TB cases will start in two states from early 2007. External quality assessment has become part of routine laboratory strengthening activities all over the country.

The programme has further increased the number of health-care providers involved in delivering TB control services both in the public and private sectors. These include all government-supported medical colleges, many large public and private enterprises, and some prison and military health services as well as facilities under the Employees’ State Insurance scheme. Individual private practitioners are also being increasingly engaged in delivering TB control services.

Successful applications to GFATM over the past years have resulted in additional external resources for RNTCP. Support from GDF continued through the direct procurement mechanism. CIDA, DFID, USAID and the World Bank also continued to provide funding support. Under the ISAC initiative, supported by various partners, additional technical assistance was provided, both to the Central TB Division as well as at the state level.

**Key achievements**

- Nationwide DOTS coverage was achieved in March 2006.
- A five-year plan (2006–11) was developed, which included all components of the Stop TB strategy.
- RNTCP guidelines for quality assurance of smear microscopy were revised and implemented across the country.
- Training modules were updated to include new initiatives, such as interventions for TB/HIV, EQA, DOTS-Plus.
- MDR-TB guidelines and training materials were developed; a Green Light Committee-approved pilot project was initiated in Delhi.
- Intensified PPM-DOTS activities were expanded from 14 to 70 districts.
- TB/HIV services linkages were scaled up to 14 states, and nationwide scale up is planned.
- Population-based mortality surveys were conducted in two states.
Operational research projects addressing programme needs were supported through zonal or state-level task forces of medical colleges.

**Challenges and constraints**

- Health systems challenges, particularly in the large northern states.
- Sub-optimal capacity of many state-level reference laboratories.
- Long and unpredictable lead time for procurement of anti-TB drugs.
- Developing coordination of inter-district and inter-state cross-border referral and transfer of patients.
- Limited capacity of the programme to engage with the large and ever growing numbers of health-care providers in different sectors.
- Disparity in the level of service delivery between TB and HIV programmes, posing challenges for joint service delivery at the operational level.

**Planned activities**

- Expansion of EQA to all laboratories throughout the country.
- Strengthening of state-level reference laboratories in ten additional states.
- Implementation of DOTS-Plus activities in two additional states.
- Addressing health systems challenges in selected states.
- Conducting population-based disease prevalence survey in six sentinel sites.
- Expansion of service linkages alongside expanding and decentralized HIV/AIDS control services.

<table>
<thead>
<tr>
<th>Estimates</th>
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</tr>
<tr>
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<td>24</td>
<td>31</td>
<td>47</td>
<td>58</td>
<td>62</td>
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<tr>
<td>Treatment success (DOTS, ss+, %)</td>
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<td></td>
</tr>
<tr>
<td>84</td>
<td>85</td>
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<td>86</td>
<td>86</td>
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</tbody>
</table>
Tuberculosis Control in the South-East Asia Region

Progress in population coverage and DOTS case detection

TB notification rates, 1995-2005

2005 Case notification by type of patient
Total notified: 1,293,713

Notifications per age-group
new smear-positive cases, 2005

Treatment results new smear-positive, 2004 cohort (n=465,518)

Progress in DOTS case detection and treatment success

Tuberculosis Control in the South-East Asia Region
Indonesia ranks third on the global list of TB high burden countries. The current estimates are derived from a recent nationwide prevalence survey conducted in 2004. The case-detection rate of smear-positive cases increased from 33% in 2003 to 65% in 2005, while the success rate has been maintained above 85% for the past five years.

The 2004 TB prevalence survey showed that progress has been made in decreasing the prevalence. Further assessments are needed to measure epidemiological progress at the provincial level and in decreasing TB-related mortality.

The country had an overall low HIV prevalence but there were concentrated epidemics in some geographical areas (Jakarta, Bali, West Java and Papua), primarily among injecting drug users. TB/HIV co-morbidity data were not routinely available, but there were indications that TB is increasing among young adults in some parts of the country where HIV prevalence was relatively high, especially among high-risk groups. TB/HIV collaborative activities are being piloted at district level and the first seroprevalence study in TB patients is being undertaken.

Implementation of the DOTS strategy was rapidly expanded to cover all health centres and public lung clinics. Hospital involvement also increased with about 30% of public and private hospitals and 28% of military hospitals delivering DOTS services. Pilot projects for the involvement of private practitioners were initiated in several provinces. DOTS expansion was supported by the establishment of provincial DOTS teams that facilitated programme management and scaling up at peripheral level.
Weaknesses in the laboratory network were recognized and are being addressed by optimizing quality control and supervision. A drug-resistance survey is being initiated preparing the grounds for the future implementation of DOTS-Plus.

A comprehensive five-year strategic plan matched with a good implementation strategy resulted in a visible impact on the ground. This attracted additional external funding from GFATM, USAID, the Tuberculosis Coalition for Technical Assistance (TBCTA), CIDA and DFID resulting in the acceleration of DOTS expansion and the initiation of new activities, such as drug-resistance surveillance, TB/HIV and epidemiological studies. Technical assistance is being provided by key Stop TB partners including WHO, KNCV Tuberculosis Foundation, Netherlands Leprosy Relief Organization and Management Sciences for Health.

The Round 5 proposal to GFATM was approved. The proposal builds on the initial gains made under the Round 1 TB grant. The goal of the proposal is to accelerate progress towards achieving the MDGs.

Under the ISAC project the following areas were supported:

1. Strengthening management capacity, through placement of national consultants at provincial and central levels.
2. Acceleration of training through placement of mobile master trainer teams to clear training backlog in large provinces.
3. Support to laboratory strengthening and drug-resistance surveillance.
4. Support to ACSM and partnership development.

The DFID supports epidemiological studies, tuberculin tests, mortality studies, involvement of hospitals, etc.

Key achievements

- Five-year strategic plan was developed and endorsed (2006-10).
- Five-year HRD plan was developed, endorsed (2006-10) and linked to national HR plans for entire health sector.
- Training of health centre staff was speeded up.
- Managerial capacity at provincial level was strengthened through the establishment of DOTS teams.
- DOTS expanded to hospitals and other government agencies.
- Guidelines for TB in AIDS patients was developed; pilot projects on TB/HIV collaboration were initiated at district level.
- Private practitioners (pilot project, supported through Fidelis) were included in the programme.
- TB in “high-risk” groups, such as prisoners, displaced people, injecting drug users and smokers, began to be addressed
- Operational research projects were put in place; links were established with universities and research institutions for implementation.
- Phase 2 of GFATM and Round 5 of GFATM were approved.

**Challenges and constraints**

- Limited financial contribution from local governments at the district and provincial level.
- Sub-optimal capacity of laboratories at different levels.
- Limited capacity to diagnose and manage MDR-TB.
- Gerdunas are functioning sub-optimally at provincial and district level.
- Underdeveloped health services and difficult geographic terrain in the eastern part of the country which has the highest incidence of TB.
- Limited community involvement in TB care.

**Planned activities**

- Optimizing hospital DOTS linkage through training and improving linkage in the primary health care system.
- Strengthening TB laboratory network and referral systems.
- Setting up of DOTS corners in antiretroviral hospitals.
- Evaluating the cost-effectiveness of various PPM mechanisms.
- Endorsing and promoting the International Standards for TB Care and the Patients’ Charter for TB Care.
- Conducting TB mortality study as part of the Indonesian Mortality Registration Strengthening System (IMRSSP).
- Conducting tuberculin studies in selected provinces in different epidemiological zones.
- Conducting TB/HIV seroprevalence studies to direct and guide TB/HIV collaborative activities.
Tuberculosis Control in the South-East Asia Region

### Estimates

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<td>All cases (per 100k/year)</td>
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<tr>
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<tr>
<td>Prevalence rate (per 100k)</td>
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<td>TB mortality (all cases per 100k/year)</td>
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### Trends

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<tr>
<td>New ss+ (%)</td>
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<td>90</td>
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</tr>
</tbody>
</table>

### Progress in population coverage and DOTS case detection

![Graph showing progression in population coverage and DOTS case detection](image)


### TB notification rates, 1995-2005

![Graph showing TB notification rates](image)

- All TB Cases
- New smear-positive cases

### 2005 Case notification by type of patient

Total notified: 254 601

- 34%
- 62%
- 2%
- 2%
- 0%
- 0%
- 0%

### Notifications per age-group

new smear-positive cases, 2005

- Male
- Female

### Age-group (years)

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

### Number of cases

- 0
- 5000
- 10000
- 15000
- 20000
- 25000

Tuberculosis Control in the South-East Asia Region
Treatment results new smear-positive, 2004 cohort (n=128,981)

- Cured: 81%
- Completed: 8%
- Died: 3%
- Failure: 1%
- Defaulted: 5%
- Not evaluated: 2%

Progress in DOTS case detection and treatment success
Maldives is among countries with the lowest TB burden in the world, having achieved the global targets of 100% DOTS coverage, 70% case detection and 85% treatment success, in 1997. The HIV prevalence is very low in the country and few cases of MDR-TB have been reported over the past several years. The current estimates of TB incidence and prevalence are based on actual case notifications which have consistently shown a downward trend of 6-10% per year. This downward trend has, however, slowed over the past two years, dropping to 2% per year.

The programme is well established across all islands, atolls and regions. The programme continues to maintain high case-detection and treatment success rates in excess of 90%. One TB register is maintained for the whole country at the capital Male’. The NTP functions through the well established public health care network in the country with dedicated TB staff at the central level. Pre-service training of health care staff is undertaken by the Institute of Health Sciences and specific pre- and in-service training on TB is provided by the TB staff at the central level. All health-care providers including private practitioners and one private hospital were involved in the TB control activities. The NTP manual as well laboratory manual were updated, printed and distributed to all health facilities during the past year.

The programme is currently focusing on increasing awareness of the disease and in increasing community involvement in detecting and treating cases with the aim of further shortening diagnostic and treatment delays. The NTP Manager participated in the meeting of the TB programme managers of island countries.
and areas in the South Pacific. This proved very useful as Maldives shares many characteristics with these small island nations.

Maldives benefits from a three-year GDF grant for first-line drugs. The Government bears most of the infrastructure costs and staff salaries as well as operational costs and supplies. Technical assistance was provided through WHO while the Tuberculosis Research Centre at Chennai supported the laboratory services.

**Key achievements**

- National guidelines and training manual were updated and printed.
- Drugs were provided from the GDF as fixed-dose combinations.
- Fully integrated service delivery was put in place.

**Challenges and constraints**

- Maintaining the quality of microscopy network.
- High turnover of expatriate health workforce requiring frequent re-training of staff.
- Frequent travel by nationals to neighbouring high-TB-burden countries and large migrant workforce from high-TB-burden countries, possibly sustaining the epidemic.

**Planned activities**

- Enhancing communication and social mobilization efforts: targeted information, education and communication (IEC) among high-risk groups.
- Establishing linkages with the Chennai Supranational Reference Laboratory for culture, DST and external quality assurance.
## Progress in population coverage and DOTS case detection

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<th>Population</th>
<th>329 000</th>
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### Trends

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### 2005 Case notification by type of patient

- **Total notified:** 123
- **New ss+**
- **New ss-**
- **Relapse**
- **Treatment after failure**
- **Treatment after default**
- **Other retreatment**

### TB notification rates, 1995-2005

#### Notifications per age-group new smear-positive cases, 2005

- **Male**
- **Female**

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**Tuberculosis Control in the South-East Asia Region**

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53
Tuberculosis Control in the South-East Asia Region

Treatment results new smear-positive, 2004 cohort (n=66)

- cured 95%
- completed 0%
- died 3%
- failure 0%
- defaulted 0%
- not evaluated 2%

Progress in DOTS case detection and treatment success

Graph showing treatment success rate over different years.
Myanmar is among the 22 countries globally with the highest burden of TB. Current estimates for incidence and prevalence of TB in Myanmar are based on a prevalence survey conducted in 1994 and routine case-notifications. The HIV prevalence in the general population was estimated at 1.3% and the HIV-prevalence among adult TB patients was estimated at 7.1%. The first representative nationwide survey of drug resistance carried out in 2004, showed 4% and 15.5% multidrug-resistance among new and previously treated TB patients, respectively.

A sound five-year strategic plan matched by good overall programme performance, led to excellent outcomes. The case-detection rate increased to 96% while the cure rate further improved to 84%.

A new financing mechanism, the 3-Disease Fund, was established in 2006 to fill the resource gap following the withdrawal of Global Fund support. This fund, supported by six international donors (AusAID, DFID, the European Commission and the Governments of the Netherlands, Sweden and Norway) aims to make available US$ 100 million to the HIV/AIDS, TB and malaria control programmes in Myanmar over the next five years, with bridge funding coming into effect immediately for the remaining period of 2006.

While the NTP has been able to make progress using domestic resources and limited external funding to maintain the core functions of the TB control programme, there is now a need to rapidly scale up additional necessary interventions to combat TB/HIV and emerging MDR. Weaknesses in the
laboratory network have to be addressed and in-country capacity for culture and DST built. TB/HIV collaborative activities have to be expanded from the initial pilot sites, given the extent of the HIV epidemic in the country. Private health-care providers have to be increasingly involved to allow for greater access to services. The reporting system is being streamlined and computerized through the introduction of the STAR software and should produce a qualitatively higher evidence base. Operational research relevant to the programme is also being conducted and has resulted in publications in various international peer-reviewed journals.

**Key achievements**

- Continuing excellent programme performance.
- New financing mechanism was established – the “3-Disease Fund”.
- Multi-sectoral coordination body for TB, HIV/AIDS and malaria was established.
- A TB Technical Strategic Group (TSG-TB) was established to coordinate all implementing partners (at national and decentralized levels); to monitor and evaluate the implementation of the programme; and to provide for lesson learning.
- Three-year National Operational Plans (2006-09) were developed collaboratively with all national and international partners by the TSG-TB.
- HRD plan was developed and linked to national HR plan for the entire health sector.
- Three training of trainers programmes in TB control management were conducted with closely monitored follow up training courses in all 325 townships.
- The first joint national workshop for HIV/TB was held; and plans for phased implementation of joint activities were developed.
- Guidelines and training materials for non-NTP partners was developed.
- Sputum collection centres were decentralized to peripheral health facilities.
- The EQA system for laboratories was introduced and collaboration with non-NTP laboratories was formalized.
- TB prevalence survey was completed in Yangon and Mandalay Divisions.
Innovative case management and community-based strategies were implemented in pilot sites leading to a drop in default rates from 20% to 8%.

Operational research agenda were developed according to NTP needs.

**Challenges and constraints**

- Need for planning and reprogramming of activities following withdrawal of Global Fund support.
- Insufficient monitoring and supervision due to GFATM termination.
- Relatively high level of drug resistance and limited capacity for the diagnosis and management of MDR-TB.
- Disparity in the availability of HIV and TB services, posing challenges for joint service delivery at the operational level.
- Uncertainty regarding supply of first-line drugs after the current GDF grant expires.
- Continuing low community awareness and limited access to TB facilities in rural and hard-to-reach areas.
- Severely overstretched technical capacity and infrastructure.

**Planned activities**

- Scaling up of TB/HIV preventive and control activities including voluntary counselling and testing at TB centres and antiretroviral treatment for TB/HIV co-infected patients.
- Conduct of a national TB disease prevalence survey.
- Setting up of a DOTS-Plus project for the management of drug-resistant TB with Green Light Committee support.
- Scaling up PPM activities including joint supervision of private practitioners.
- Development of national guidelines on management of childhood TB.
- Establish capacity for DST at sub-national laboratory in Mandalay.
- Initiate a system of mobile teams for better case finding in hard-to-reach and border areas.
- Develop ACSM strategy.
- Conduct a second national DRS.
Progress in population coverage and DOTS case detection

TB notification rates, 1995-2005

2005 Case notification by type of patient
Total notified: 107 991

Notifications per age-group
new smear-positive cases, 2005
Treatment results new smear-positive 2004 cohort (n=31,353)

- Cured: 76%
- Completed: 8%
- Died: 6%
- Failure: 2%
- Defaulted: 6%
- Not evaluated: 2%

Progress in DOTS case detection and treatment success

DOTS detection rate
Nepal

Nepal is among the intermediate TB-burden countries in the Region. Current estimates for incidence and prevalence of TB in Nepal are based on a prevalence survey conducted in the 1970s and on routine case-notifications from the programme. Nepal is reporting concentrated HIV epidemics with a higher prevalence of HIV being reported among injecting drug users and other high risk groups. Nepal has been participating in successive rounds of global anti-TB drug-resistance surveillance. The level of multidrug resistance among previously untreated TB patients was reported at 1.3% in 2001.

The programme continued to function well even in conditions of political instability. Most NTP activities could be carried out, except for regular supervision. Nepal demonstrated commendable results with a case-detection rate close to the 70% target and treatment success rates maintained well above the global target of 85%.

The national strategy was revised to include the additional components and approaches under the new Stop TB strategy. Developing human resource capacity remains a priority for the programme. Private health sector involvement in service delivery in the Kathmandu valley has been sustained. Plans are being developed to expand the Practical Approach to Lung Health (PAL) programme, which was piloted in two districts. Community activities have been further strengthened. Capacity building is in progress for the management of MDR-TB through the Green Light Committee-approved DOTS-Plus projects as well as for conducting regular drug-resistance surveillance and continued HIV sero surveillance among TB patients. Second-line drugs were available at five centres in the country. A first review of the DOTS-Plus project took place
in September 2006. TB/HIV activities were initiated but needs to be scaled up significantly, especially among high-risk population groups.

The Global Fund (Round 4) has become the single largest donor in the country for TB control, with a grant agreement of US$ 3 354 080 approved for the first two years. First-line drugs were supplied by the GDF through its direct procurement mechanism. The programme also received assistance from a few international NGOs including the Norwegian Association for Health and Lung Patients.

**Key achievements**

- Additional components of the new Stop TB strategy were included within the national strategy for TB control.
- First external review of the DOTS-Plus project was conducted.
- First national tuberculin survey was conducted.
- Core collaboration group between NTP and National Centre for AIDS and STD Control was established.
- Training of selected staff was undertaken in preparation for drug-resistance survey.
- Training of selected staff was undertaken in preparation for Round 5 of HIV serosurveillance among TB patients.

**Challenges and constraints**

- Limited capacity of the national reference laboratory.
- Discontinuation of the posts of regional coordinators.
- Insufficient capacity for drugs and supplies management.
- Limited ability to take up additional responsibilities under the broadened strategy.
- Scaling down of support by international NGOs.

**Planned activities**

- Expansion of the DOTS programme to all sub health posts.
- Conducting the next round of drug-resistance surveillance and enhancing capacity for the management of MDR-TB at additional sites.
- Conducting the fifth HIV serosurveillance among TB patients.
- Strengthening capacity for routine and proposed additional activities.
- Strengthening of routine supervision of the programme.
Progress in population coverage and DOTS case detection

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Trends

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<td>New ss+ (%)</td>
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2005 Case notification by type of patient
Total notified: 34 077

Notifications per age-group
new smear-positive cases, 2005

- Male
- Female

Notification rates, 1995-2005

- All TB Cases
- New smear-positive cases
Treatment results new smear-positive
2004 cohort (n=14,614)

cured 85%
comple:ted 2%
died 5%
failure 2%
defaulted 3%
not evaluated 3%

Progress in DOTS case detection
and treatment success

Tuberculosis Control in the South-East Asia Region
Sri Lanka

Sri Lanka is among the low TB-burden countries in the Region. Current estimates for incidence and prevalence of TB in Sri Lanka are based on routine case-notifications from the programme. Plans to undertake a national ARTI survey in 2007 have been developed. Sri Lanka is considered to have a low prevalence of HIV. Sri Lanka has recently undertaken a national anti-TB drug resistance survey. The level of multidrug resistance among previously untreated TB patients was reported at 1.1%.

Sri Lanka achieved both global targets. The case-detection rate in 2005 was 86% and treatment success rate among patients registered in 2004 was 85%. The default rate decreased as compared to earlier years but is still high in several parts of the country, including the city of Colombo.

A national 10-year strategic plan and a five-year plan of action for TB control have been developed. Based on this, annual activity plans and proposals for donors are formulated. Improvements in infrastructure, strengthening of the capacity at central and district level, training of various levels of staff and better coordination between the centre, provinces, and districts have further strengthened national TB control efforts. Fixed-dose combinations have now been introduced for use in most health facilities and loose drugs are being phased out. The programme’s main challenges include rendering TB control services in areas affected by the civil conflict.

Sri Lanka was the first country in the Region to move to the second phase of the Global Fund. The country has applied for additional support to the TB control programme during Round 6 of Global Fund applications, mainly to
support community-based activities, interventions for TB/HIV and management of MDR-TB. The country also continues to benefit from a GDF grant of first-line drugs. The programme will continue to receive additional funding support from the World Bank till 2008. During 2005 the programme received funding assistance from the Fidelis grant to scale up prevention and control activities to marginalized populations living in estates and conflict-affected areas.

Key achievements

- Development of the 10-year strategic plan and a five-year plan of action for TB control.
- Extension of further funding support from the Global Fund.
- Introduction of fixed-dose combinations of anti-TB drugs.
- Further expansion of the laboratory network for improved access to diagnosis.
- Involvement of medical colleges and private practitioners.

Challenges and constraints

- Insufficient coordination with provincial and district health staff and health facilities under other curative and preventive services and municipalities.
- Inadequate involvement of private practitioners and private laboratories.
- Need to expand and rigorously implement the laboratory quality-assurance mechanism.
- High default rates especially in urban settings.
- Inadequate skilled staff especially at district level and high turnover of the existing staff at all levels.

Planned activities

- Further strengthening of the managerial and technical capacity of the central unit as well as district focal points.
- Strengthening culture and DST facilities at the national reference laboratory and identifying additional laboratories for culture facilities.
- Developing a protocol and planning for the management of MDR-TB cases in consultation with the Green Light Committee.
- Developing national strategies jointly with the National AIDS Programme to address the needs of those with both TB and HIV.
- Strengthen the inter-sectoral collaboration.
- Obtain better estimates of the disease burden in the country.
Tuberculosis Control in the South-East Asia Region

### Estimates

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### Trends

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### Progress in population coverage and DOTS case detection

- **TB notification rates, 1995-2005**

### 2005 Case notification by type of patient

- Total notified: 9 449
  - New ss+: 51%
  - New ss-: 23%
  - New EP: 3%
  - Relapse: 1%
  - Treatment after failure: 1%
  - Treatment after default: 0%
  - Other retreatment: 20%

### Notifications per age-group

- **new smear-positive cases, 2005**
  - Female: 0-14: 500, 15-24: 300, 25-34: 100, 35-44: 50, 45-54: 20, 55-64: 10, >65: 0
Tuberculosis Control in the South-East Asia Region

Treatment results new smear-positive 2004 cohort (n=3 928)

- Cured: 83%
- Completed: 2%
- Died: 3%
- Failure: 1%
- Defaulted: 8%
- Not evaluated: 1%

Progress in DOTS case detection and treatment success

- Treatment success rate
- DOTS detection rate

- Data points for years 1997 to 2005
Thailand

Thailand is among the highest TB burden countries in the world. The current estimates for the prevalence and incidence of TB is based on a prevalence survey conducted in 1991, recent limited prevalence surveys and routine case notifications. Additional surveys are planned to obtain better estimates of disease burden including among people living with HIV/AIDS during the next two years and beyond. Routine programme surveillance is also being strengthened with further improvements in the electronic and reporting system already in place in the country. In 2006, the NTP adopted the quarterly reporting system replacing the thrice-yearly reporting system. This will make international comparisons more straightforward as well as facilitate aligning to reporting cycles of major donors including the Global Fund.

Thailand is reporting generalized HIV epidemic. Nationwide surveillance for TB/HIV co-morbidity is routinely undertaken. The HIV epidemic has had a significant impact on TB with higher case notifications among young adults. The overall prevalence of HIV among adult TB patients is estimated at 8.5%. Thailand has been participating in successive rounds of the global anti-TB drug resistance surveillance. The level of MDR-TB among previously untreated TB patients was reported at 0.9% in 2001.

Thailand is a middle-income country with a well developed health infrastructure. Provinces and districts enjoy a fair degree of autonomy and planning and budgeting for health programmes is decentralized. The health sector reform agenda is aimed at providing equitable access to all essential health services. TB control is included under the Universal Care Package of the
Government. While this has increased access to services, the transition from the largely vertically administered TB services to integrated service delivery within primary health care services has resulted in sub-optimal programme performance. The private sector has also been given more attention in recent years in the health sector reform process. Potentially replicable PPM initiatives were established in Bangkok but were not widely replicated despite availability of GFATM funding.

In other areas, however, the NTP has made good progress. External quality assessment has become part of routine laboratory strengthening activities all over the country. The national TB reference laboratory has been participating in subsequent rounds of proficiency testing and is in the final stage of being certified as a supranational reference laboratory. Interventions for TB/HIV were made widely available with community based care established as the norm. With support from NGOs, the programme aims at catering to the needs of migrant workers in cities and refugees in border areas. The International Training Centre of the Bureau for AIDS, Tuberculosis and STIs offers a number of training courses. The first and second South-East Asia Regional TB/HIV training of trainers courses organized by WHO were hosted at this centre.

TB control activities were mainly supported through domestic funding. The NTP in Thailand also benefited from additional funding support from the Global Fund. The programme is technically supported by the U.S. Centers for Disease Control and Prevention (CDC) and WHO.

**Key achievements**

- NTP strategic plan was developed, covering the period 2006-15.
- Lot Quality Assurance Sampling for sputum smear microscopy was introduced.
- Culture and DST facilities were strengthened at the intermediate level.
- National TB/HIV coordinating board was put in place, and interventions for TB/HIV were made widely available.
- Marginalized population groups were targeted in collaboration with NGOs.

**Challenges and constraints**

- Need to strengthen technical and managerial capacity and supervision of general health staff at all levels for better implementation of TB service delivery.
- Ensuring proper implementation of high-quality DOTS within the context of the 30-Baht Scheme.
- Limited coordination among various service providers, particularly in Bangkok; national TB and TB/HIV guidelines not always adhered to in tertiary hospitals.
- MDR-TB and PPM DOTS interventions not included in regular TB training package.
- HRD strategy not linked to overall national HRD plan for health sector and limited to 2005-06.
- No systematic quality control for TB drugs.

**Planned activities**

- Introducing diagnostic counselling and testing to revise TB and HIV integrated service in 14 health facilities.
- Strengthen PPM in Bangkok documenting the successful PPM models and, based on this, develop policy guidelines for scale up collaborating between hospitals and health centres in Bangkok city.
- Collaborating with the Office of National Health Insurance and developing a “standard of TB care for contracting unit of primary care” consistent with ISTC.

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<td><strong>Notification Rates</strong></td>
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**Tuberculosis Control in the South-East Asia Region**

**Progress in population coverage and DOTS case detection**

- Chart showing the increase in DOTS detection rate with population coverage.

**TB notification rates, 1995-2005**

- Chart showing the trends in TB notification rates from 1995 to 2005.
- Key: All TB Cases, New smear-positive cases.

**2005 Case notification by type of patient**

- Total notified: 51,266
- Pie chart showing the distribution by type of patient:
  - New ss-: 3%
  - New ss+: 13%
  - New EP: 32%
  - Relapse: 0%
  - Treatment after failure: 0%
  - Treatment after default: 0%
  - Other retreatment: 52%

**Notifications per age group new smear-positive cases, 2005**

- Graph showing the number of cases per age group (0-14, 15-24, 25-34, 35-44, 45-54, 55-64, >65).
- Key: Male, Female.

**Treatment results new smear-positive 2004 cohort (n=28,421)**

- Pie chart showing the treatment outcomes:
  - Completed: 3%
  - Died: 4%
  - Failure: 1%
  - Defaulted: 6%
  - Not evaluated: 17%

**Progress in DOTS case detection and treatment success**

- Chart showing the treatment success rate with DOTS detection rate.
Timor-Leste has the highest case notification rates (398 per 100 000 population) among the countries in the Region. Current estimates for the prevalence and incidence of TB are derived from previous prevalence surveys conducted in similar geographic areas in Indonesia. The HIV prevalence was considered to be low in the country and few cases of MDR-TB were reported in recent years.

The TB central management unit of the NTP has been in place for more than a year and is now fully responsible for coordinating all TB activities in the country following the handover of the programme from Caritas-Dili. The major constraint faced by the Ministry of Health was related to an overall lack of adequate technical and managerial capacity to effectively deliver health including TB control services at all levels. However, good progress has been made with DOTS expansion and decentralization of services to the district level. Treatment success rates were maintained around 80%; supervised treatment was not strictly followed in all parts of the country. The country has introduced fixed-dose combinations in pilot areas and is now phasing out loose drugs in all health facilities.

An increase in case detection has not followed the decentralization of services due to poor community awareness and lack of sufficiently skilled and motivated staff at the sub-district level. Supervision and training activities have been intensified. Plans are in place to improve accessibility to microscopy services through decentralizing sputum collection and slide fixation. The programme is now focusing on increasing the involvement of community volunteers in providing supervised treatment and disseminating ACSM messages.

A protocol and plan to diagnose and treat the few drug-resistant TB cases in the country was developed and approved by the Green Light Committee.
Arrangements have been made for training a few Timorese doctors on the management of MDR-TB cases in collaboration with the Makati Medical Centre in Manila, the Philippines.

The NTP in Timor-Leste received funding support from the Global Fund and is additionally supported by a free grant of drugs from GDF. WHO provided technical assistance and limited funding support. Laboratory activities were technically supported by the supranational reference laboratory in Adelaide, Australia and the programme also received technical assistance from the Menzies School for Tropical Diseases, Australia.

**Key achievements**
- Development of the five-year national plan for TB control.
- Improved technical and managerial capacity of the central unit of the NTP.
- Securing of GFATM funding after initial delays in disbursement.
- Securing of GDF support under a three-year grant.
- Approval of a project for the management of MDR-TB.
- Establishment of links with designated supranational reference laboratories for improved laboratory services.

**Challenges and constraints**
- Insufficient capacity for effective implementation and monitoring of services at various levels.
- Varying quality of implementation of TB services at district and sub-district levels.
- Poor access and utilization of TB control services in many parts of the country.
- Insufficient baseline data on the burden and trends of TB in the country.

**Planned activities**
- Building technical and managerial capacity of health staff including at the central level.
- Further strengthening of laboratory capacity at district level and decentralized sputum collection.
- Improved supervision of programme implementation.
- Introduction of fixed-dose combination drugs at all health facilities and better drug supply management.
- Communication and social mobilization activities to improve uptake of services.
Tuberculosis Control in the South-East Asia Region

Progress in population coverage and DOTS case detection

<table>
<thead>
<tr>
<th>Estimates</th>
<th></th>
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<tbody>
<tr>
<td>Population</td>
<td>947 000</td>
<td></td>
</tr>
<tr>
<td>Incidence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All cases</td>
<td>4 927</td>
<td></td>
</tr>
<tr>
<td>All cases (per 100k/year)</td>
<td>556</td>
<td></td>
</tr>
<tr>
<td>New ss+</td>
<td>2 215</td>
<td></td>
</tr>
<tr>
<td>New ss+ (per 100k/year)</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>Prevalence rate (per 100k)</td>
<td>692</td>
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<tr>
<td>TB mortality (all cases per 100k/year)</td>
<td>85</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Trends</th>
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<th>02</th>
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<th>05</th>
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</thead>
<tbody>
<tr>
<td>Notification Rates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All cases (per 100k)</td>
<td>–</td>
<td>–</td>
<td>374</td>
<td>355</td>
<td>344</td>
<td>398</td>
</tr>
<tr>
<td>New ss+ (per 100k)</td>
<td>–</td>
<td>–</td>
<td>148</td>
<td>132</td>
<td>108</td>
<td>109</td>
</tr>
<tr>
<td>DOTS case-detection rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New ss+ (%)</td>
<td>–</td>
<td>–</td>
<td>59</td>
<td>53</td>
<td>43</td>
<td>47</td>
</tr>
<tr>
<td>Treatment success (DOTS, ss+, %)</td>
<td>–</td>
<td>73</td>
<td>81</td>
<td>81</td>
<td>80</td>
<td>–</td>
</tr>
</tbody>
</table>

TB notification rates, 2002-2005

2005 Case notification by type of patient
Total notified: 3 783

Notifications per age-group
new smear-positive cases, 2005

2005 Case notification by type of patient
Total notified: 3 783

2005 Case notification by type of patient
Total notified: 3 783
Tuberculosis Control in the South-East Asia Region

Treatment results new smear-positive 2004 cohort (n=1000)
- Cured: 66%
- Completed: 13%
- Died: 5%
- Defaulted: 9%
- Not evaluated: 6%

Progress in DOTS case detection and treatment success
- 2002
- 2003
- 2004
- 2005
Definitions

A case of tuberculosis. A patient in whom tuberculosis has been bacteriologically confirmed or diagnosed by a clinician.

Smear-positive pulmonary tuberculosis. A patient who has one of the following:

- two or more initial sputum smear examinations positive for acid-fast bacilli (AFB); or
- one sputum examination positive for AFB plus radiographic abnormalities consistent with active pulmonary tuberculosis as determined by a clinician; or
- one sputum specimen positive for AFB and at least one sputum that is culture positive for AFB.

Smear-negative pulmonary tuberculosis. A case of pulmonary tuberculosis that does not meet the above definition of smear-positive tuberculosis.

Extra-pulmonary tuberculosis. Tuberculosis of organs other than the lungs, e.g. pleura, lymph nodes, abdomen, genitor-urinary tract, skin, joints, bones, meninges. A patient diagnosed with both pulmonary and extra-pulmonary tuberculosis should be classified as pulmonary only.

New case. A patient who has never received treatment for tuberculosis or has taken anti-tuberculosis drugs for less than one month (30 days).

Retreatment case. Patient who was treated for tuberculosis for more than one month.

Relapse. A patient previously treated for tuberculosis and declared “cured” or “treatment completed” and diagnosed with bacteriologically positive tuberculosis.

Treatment after default. A patient who has interrupted treatment for at least two months and who is again smear-positive at the time of starting the retreatment regimen.

Treatment after failure. A patient who was declared “treatment failure” after a Category I or III regimen and is eligible for a Category II regimen.

Other retreatment case. A patient who is starting a retreatment regimen and does not fit in the above categories of relapse, treatment after default or treatment after failure.
**Chronic case.** A patient who remains smear-positive upon completion of a retreatment regimen.

**Transfer in case.** A patient who continues treatment in a centre under a different reporting unit than from where he has been reported.

**Cured.** Initially smear-positive patient who was smear-negative in the last month of treatment and on at least one previous occasion.

**Completed treatment.** A patient who has completed treatment but who does not meet the criteria to be classified as cured or failure.

**Died.** A patient who dies for any reason during the course of treatment.

**Failure.** Smear-positive patient who remains or becomes again smear-positive at five months or later (for new case) or at the end of treatment (for retreatment case). A smear-negative case who becomes smear-positive during the treatment.

**Defaulted.** A patient who has interrupted treatment for two consecutive months or more.

**Transferred out.** A patient who has been transferred to another recording and reporting unit and for whom the treatment outcome is not known.

**Not evaluated.** A patient who did not have the treatment outcome evaluated.

**Case-detection rate.** The number of all new smear-positive cases detected in a certain period out of all new smear-positive cases estimated to occur during that period.

**DOTS detection rate.** The number of new smear-positive cases detected under DOTS in a certain period out of all new smear-positive cases estimated to occur during that period.

**Case-notification rate.** The number of cases detected in a certain period (usually one year) per 100 000 population.

**Cure rate.** Proportion of cured cases out of all cases registered in a certain period. Cure rates are calculated for new smear-positive cases, relapses, treatment after default, treatment after failure or other smear-positive retreatment cases.

**Completion rate.** Proportion of patients declared “treatment completed” out of all cases registered in a certain period.

**Treatment success rate.** The sum of the proportions of patients who were cured and patient who completed treatment out of all cases registered in a certain period.

**DOTS coverage.** Percentage of the country’s population living in administrative areas where DOTS services are available.
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