

Executive summary

This is the sixteenth global report on tuberculosis (TB) published by WHO in a series that started in 1997. It provides a comprehensive and up-to-date assessment of the TB epidemic and progress in implementing and financing TB prevention, care and control at global, regional and country levels using data reported by 198 countries that account for over 99% of the world's TB cases.

The introductory chapter (**Chapter 1**) provides general background on TB as well as an explanation of global targets for TB control, the WHO's Stop TB Strategy and the Stop TB Partnership's Global Plan to Stop TB 2011–2015. The main findings and messages about the six major themes covered in the rest of the report are provided below.

The burden of disease caused by TB (Chapter 2)

In 2010, there were 8.8 million (range, 8.5–9.2 million) incident cases of TB, 1.1 million (range, 0.9–1.2 million) deaths from TB among HIV-negative people and an additional 0.35 million (range, 0.32–0.39 million) deaths from HIV-associated TB.

Important new findings at the global level are:

- The absolute number of TB cases has been falling since 2006 (rather than rising slowly as indicated in previous global reports);
- TB incidence rates have been falling since 2002 (two years earlier than previously suggested);
- Estimates of the number of deaths from TB each year have been revised downwards;
- In 2009 there were almost 10 million children who were orphans as a result of parental deaths caused by TB.

Updates to estimates of disease burden follow the completion of a series of consultations with 96 countries between 2009 and 2011, including China, India and 17 African countries in the past year, and much greater availability and use of direct measurements of TB mortality. Ongoing efforts to further improve measurement of TB cases and deaths under the umbrella of the WHO Global Task Force on TB Impact Measurement, including impressive progress on TB prevalence surveys and innovative work to strengthen surveillance, are summarized.

At country level, dramatic reductions in TB cases and deaths have been achieved in China. Between 1990 and 2010, prevalence rates were halved, mortality rates fell

by almost 80% and TB incidence rates fell by 3.4% per year. Methods used to measure trends in disease burden in China – nationwide prevalence surveys, a sample vital registration system and a web-based case notification system – provide a model for many other countries.

Other results reinforce the findings of previous global reports:

- The world and all of WHO's six regions are on track to achieve the Millennium Development Goal target that TB incidence rates should be falling by 2015;
- TB mortality rates have fallen by just over a third since 1990, and the world as well as five of six WHO regions (the exception being the African Region) are on track to achieve the Stop TB Partnership target of halving 1990 mortality rates by 2015;
- The Stop TB Partnership target of halving TB prevalence rates by 2015 compared with 1990 is unlikely to be achieved globally, although the target has already been reached in the Region of the Americas and the Western Pacific Region is very close to reaching the target;
- There were 3.2 million (range, 3.0–3.5 million) incident cases of TB and 0.32 million (range, 0.20–0.44 million) deaths from TB among women in 2010;
- About 13% of TB cases occur among people living with HIV.

Case notifications and treatment outcomes (Chapter 3)

In 2010, there were 5.7 million notifications of new and recurrent cases of TB, equivalent to 65% (range 63–68%) of the estimated number of incident cases in 2010. India and China accounted for 40% of the world's notified cases of TB in 2010, Africa for a further 24% and the 22 high-TB burden countries (HBCs) for 82%. At global level, the treatment success rate among new cases of smear-positive pulmonary TB was 87% in 2009.

Between 1995 and 2010, 55 million TB patients were treated in programmes that had adopted the DOTS/Stop TB Strategy, and 46 million were successfully treated. These treatments saved almost 7 million lives.

Alongside these achievements, diagnosis and appropriate treatment of multidrug-resistant TB (MDR-TB) remain major challenges. Less than 5% of new and previously treated TB patients were tested for MDR-TB in

most countries in 2010. The reported number of patients enrolled on treatment has increased, reaching 46 000 in 2010. However, this was equivalent to only 16% of the 290 000 cases of MDR-TB estimated to exist among notified TB patients in 2010.

Financing TB care and control (Chapter 4)

In 97 countries with 92% of the world's TB cases for which trends can be assessed, funding from domestic and donor sources is expected to amount to US\$ 4.4 billion in 2012, up from US\$ 3.5 billion in 2006. Most of this funding is being used to support diagnosis and treatment of drug-susceptible TB, although funding for MDR-TB is growing and expected to reach US\$ 0.6 billion in 2012. Countries report funding gaps amounting to almost US\$ 1 billion in 2012.

Overall, domestic funding accounts for 86% of total funding, with the Global Fund accounting for 12% (82% of all international funding) and grants from other agencies for 2%, but striking contrasts between BRICS (Brazil, the Russian Federation, India, China and South Africa) and other countries are highlighted:

- BRICS invested US\$ 2.1 billion in TB control in 2010, 95% of which was from domestic sources;
- In the other 17 HBCs, total expenditures were much lower (US\$ 0.6 billion) and only 51% of funding was from domestic sources.

Most of the funding needed to scale up the treatment of MDR-TB towards the goal of universal access is needed in BRICS and other middle-income countries (MICs). If BRICS and other MICs fully finance the scale-up of treatment for MDR-TB from domestic sources, current levels of donor financing for MDR-TB would be almost sufficient to fund the scale-up of MDR-TB treatment in low-income countries.

Donor funding for TB is expected to reach US\$ 0.6 billion in 2012, a 50% increase compared with US\$ 0.4 billion in 2006, but far short of donor funding for malaria (US\$ 1.8 billion in 2010) and HIV (US\$ 6.9 billion in 2010).

New diagnostics and laboratory strengthening (Chapter 5)

The first data on the roll-out of Xpert MTB/RIF, a new rapid molecular test that has the potential to substantially improve and accelerate the diagnosis of TB and drug-resistant TB, are presented. By 30 June 2011, six months after the endorsement of Xpert MTB/RIF by WHO in December 2010, 26 of the 145 countries eligible to purchase GeneXpert instruments and Xpert MTB/RIF cartridges at concessional prices had done so. This shows that the transfer of technology to developing countries can be fast.

The continued inadequacy of conventional laboratory capacity is also illustrated:

- In 2010, 8 of the 22 HBCs did not meet the benchmark of 1 microscopy centre per 100 000 population;
- Among the 36 countries in the combined list of 22 HBCs and 27 high MDR-TB burden countries, 20 had less than the benchmark of 1 laboratory capable of performing culture and drug susceptibility testing per 5 million population.

Overall, laboratory strengthening needs to be accelerated, as is currently happening in 27 countries through the EXPAND-TB project supported by UNITAID.

Addressing the co-epidemics of TB and HIV (Chapter 6)

Progress in scaling up interventions to address the co-epidemics of TB and HIV has continued:

- In 2010, HIV testing among TB patients reached 34% globally, 59% in the African Region and $\geq 75\%$ in 68 countries;
- Almost 80% of TB patients known to be living with HIV were started on cotrimoxazole preventive therapy (CPT) and 46% were on antiretroviral therapy (ART) in 2010;
- A large increase in screening for TB among people living with HIV and provision of isoniazid preventive therapy to those without active TB disease occurred in 2010, especially in South Africa.

Impressive improvements in recent years notwithstanding, much more needs to be done to reach the Global Plan targets that all TB patients should be tested for HIV and that all TB patients living with HIV should be provided with CPT and ART.

Research and development (Chapter 7)

The topic of research and development is discussed for the first time in the global report. There has been considerable progress in diagnostics in recent years, including the endorsement of Xpert MTB/RIF at the end of 2010; other tests including point-of-care tests are in the pipeline. There are 10 new or repurposed TB drugs in clinical trials that have the potential to shorten the treatment of drug-susceptible TB and improve the treatment of MDR-TB. Results from three Phase III trials of 4-month regimens for the treatment of drug-susceptible TB are expected between 2012 and 2013, and results from two Phase II trials of new drugs for the treatment of MDR-TB are expected in 2012. There are 9 vaccine candidates in Phase I or Phase II trials. It is hoped that one or both of the candidates currently in a Phase II trial will enter a Phase III trial in the next 2–3 years, with the possibility of licensing at least one new vaccine by 2020.