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Cover design by Tom Hiatt, WHO Stop TB Department. Of the estimated 9.3 million new cases of TB that occurred in 2007, 1.4 million (15%) were infected with HIV. The WHO African Region accounted for 79% of these HIV-positive TB cases, followed by the WHO South-East Asia Region (11%). In the absence of appropriate treatment, the mortality rate in HIV-positive TB cases is high. However, this rate can be significantly reduced if provider-initiated HIV testing is made available to all TB patients and if interventions such as early antiretroviral therapy are made available to those who are HIV-positive. The cover image is a dot chart showing the relative contribution of countries (blue dots) and WHO regions (green dots) to the global burden of HIV-positive TB.

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Contents

Acknowledgements v
Abbreviations vii
Key points **1**
Introduction **5**
Chapter 1. Epidemiology **6**
Goals, targets and indicators for TB control 6
TB incidence, prevalence and mortality 7
Incidence 7
Prevalence 12
Mortality 12
Summary of progress towards MDG and Stop TB Partnership impact targets 14
Improving measurement of progress towards the 2015 impact targets: the WHO Global Task Force on TB Impact Measurement 16
Measurement of incidence 16
Measurement of prevalence 19
Measurement of mortality 20
Status of impact measurement in HBCs at the end of 2008 20
Case notifications 22
Total case notifications 22
Case notifications disaggregated by sex 22
Case detection rates 23
Case detection rate, all sources (DOTS and non-DOTS programmes) 23
Case detection rate, DOTS programmes 26
Outcomes of treatment in DOTS programmes 27
New smear-positive cases 27
Re-treatment cases 29
Comparison of treatment outcomes in HIV-positive and HIV-negative TB patients 30
Progress towards reaching targets for case detection and treatment success 30
Summary 32
Chapter 2. Strategy **34**
Data reported to WHO in 2008 35
DOTS expansion and enhancement 35
DOTS coverage and numbers of patients treated 35
Political commitment 37
Early case detection through quality-assured bacteriology 37
Standardized treatment with supervision, and patient support 40
Drug supply and management system 41
Monitoring and evaluation 41
Address TB/HIV, MDR-TB, and the needs of poor and vulnerable populations 43
Collaborative TB/HIV activities 43
Diagnosis and treatment of MDR-TB 49
Poor and vulnerable populations 54
Contribute to health system strengthening based on primary health care 54
Integration in primary health care 54

Alignment with broader planning and financing frameworks 55
Human resource development 55
Infection control 55
Practical Approach to Lung Health 56
Engage all care providers 57
Public–private mix approaches 57
International Standards for Tuberculosis Care 58
Empower people with TB, and communities through partnership 58
Advocacy, communication and social mobilization 58
Community participation in TB care 58
Patients' Charter for Tuberculosis Care 58
Enable and promote research 58
Summary 59
Chapter 3. Financing 60
Data reported to WHO in 2008 60
NTP budgets, available funding and funding gaps 60
High-burden countries 60
All countries 63
Total costs of TB control 64
High-burden countries 64
All countries 67
Comparisons with the Global Plan 69
High-burden countries 69
All countries 69
Budgets and costs per patient 71
Expenditures compared with available funding and changes in the number of patients treated 72
Global Fund financing 74
High-burden countries 74
All countries 74
Funding gaps and the global financial crisis 75
Summary 77
Conclusions 78
Annex 1. Profiles of high-burden countries 79
Annex 2. Methods 171
Data collection and verification – an overview 173
Epidemiology and surveillance 174
Implementation of the Stop TB Strategy 180
Financing 181
Annex 3. The Stop TB Strategy, case reports, treatment outcomes and estimates of TB burden 187
Explanatory notes 188
Summary by WHO region 191
Africa 197
The Americas 217
Eastern Mediterranean 237
Europe 249
South-East Asia 269
Western Pacific 281
Annex 4. Surveys of tuberculosis disease and availability of death registration data at WHO, by country and year 301

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The main purpose of this report is to provide a comprehensive and up-to-date assessment of the TB epidemic and progress in control of the disease at global, regional and country levels. This analysis is based on data about notifications of TB cases and the outcomes of treatment (from surveillance systems) as well as data related to the implementation and financing of the Stop TB Strategy. Data are supplied primarily by national TB control programme managers who lead work on surveillance, strategy and financing in countries. These people are listed in Annex 3, and we thank them all for their invaluable contribution and collaboration.

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Abbreviations

ACSM	advocacy, communication and social mobilization
AFB	acid-fast bacilli
AFR	WHO African Region
AFRO	WHO Regional Office for Africa
AIDS	acquired immunodeficiency syndrome
AMR	WHO Region of the Americas
AMRO	WHO Regional Office for the Americas
ARI	annual risk of infection
ART	antiretroviral therapy
BMU	basic management unit
BRAC	Bangladesh Rural Advancement Committee
CPT	co-trimoxazole preventive therapy
CTBC	community-based TB care
DHIS	District Health Information Software
DOT	directly observed treatment
DOTS	the basic package that underpins the Stop TB Strategy
DRS	drug resistance surveillance or survey
DST	drug susceptibility testing
ECDC	European Centre for Disease Prevention and Control
EMR	WHO Eastern Mediterranean Region
EMRO	WHO Regional Office for the Eastern Mediterranean
ENRS	Electronic National Record System
EQA	external quality assurance
EUR	WHO European Region
EURO	WHO Regional Office for Europe
FDC	fixed-dose combination (or FDC anti-TB drug)
FIDELIS	Fund for Innovative DOTS Expansion, managed by the Union
FIND	Foundation for Innovative New Diagnostics
GDF	Global TB Drug Facility
GLC	Green Light Committee
GLI	Global Laboratory Initiative
Global Fund	The Global Fund to fight AIDS, Tuberculosis and Malaria
Global Plan	Global Plan to Stop TB, 2006–2015
GNI	gross national income
HBC	high-burden country of which there are 22 that account for approximately 80% of all new TB cases arising each year
HIV	human immunodeficiency virus
HRD	human resource development
ICD-10	International Statistical Classification of Diseases
IEC	information, education, communication
IPT	isoniazid preventive therapy
IRR	incidence rate ratio
ISTC	International Standards for Tuberculosis Care
KAP	knowledge, attitudes and practice
MDG	Millennium Development Goal
MDR	multidrug resistance (resistance to, at least, isoniazid and rifampicin)
MDR-TB	multidrug-resistant tuberculosis
NGO	nongovernmental organization
NRL	national reference laboratory
NTP	national tuberculosis control programme or equivalent
OpenMRS	Open Medical Records System
PAL	Practical Approach to Lung Health
PPM	Public–Private Mix
PPP	Public–Private Partnerships
RDBMS	relational database management system
SCC	short-course chemotherapy
SEAR	WHO South-East Asia Region
SEARO	WHO Regional Office for South-East Asia
SRL	supranational reference laboratory
SRLN	supranational reference laboratory network
TB	tuberculosis
TBTEAM	TB Technical Assistance Mechanism
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNITAID	international facility for the purchase of drugs to treat HIV/AIDS, malaria and TB
USAID	United States Agency for International Development
WHA	World Health Assembly
WHO	World Health Organization
WHO-CHOICE	CHOosing Interventions that are Cost-Effective
WPR	WHO Western Pacific Region
WPRO	WHO Regional Office for the Western Pacific
XDR-TB	TB caused by MDR strains that are also resistant to a fluoroquinolone and, at least, one second-line injectable agent (amikacin, kanamycin and/or capreomycin)

Key points

On trouvera les points essentiels du rapport 2009 de l'OMS relatif à la lutte antituberculeuse dans le monde sur le site Web indiqué ci-dessous:
Los puntos principales del informe mundial de 2009 de la OMS sobre la tuberculosis se pueden consultar en el sitio web que se indica más abajo:
世卫组织 2009 年全球结核病控制报告的要点请参见以下所示网站:
С основными положениями Доклада ВОЗ о глобальной борьбе против туберкулеза за 2009 г. можно ознакомиться на приведенном ниже веб-сайте:
ترد النقاط الرئيسية في تقرير منظمة الصحة العالمية لعام ٢٠٠٩ عن مكافحة السل على الصعيد العالمي في الموقع الوارد أدناه على شبكة الإنترنت:

www.who.int/tb/publications/global_report/2009/key_points/

1. This report is the 13th annual report on global control of tuberculosis (TB) published by the World Health Organization (WHO) in a series that started in 1997. Its main purpose is to provide a comprehensive and up-to-date assessment of the TB epidemic and progress in controlling the disease at global, regional and country levels, in the context of global targets set for 2015. Results are based primarily on data reported to WHO via its standard TB data collection form in 2008 and on the data that were collected every year from 1996 to 2007. The 196 countries and territories that reported data in 2008 account for 99.6% of the world's estimated number of TB cases and 99.7% of the world's population.

2. The main targets for global TB control are (i) that the incidence of TB should be falling by 2015 (MDG Target 6.c), (ii) that TB prevalence and death rates should be halved by 2015 compared with their level in 1990, (iii) that at least 70% of incident smear-positive cases should be detected and treated in DOTS programmes and (iv) that at least 85% of incident smear-positive cases should be successfully treated. The latest data suggest (i) that the incidence rate has been falling since 2004, (ii) that prevalence and death rates will be halved in at least three of six WHO regions by 2015 compared with a baseline of 1990, but that these targets will not be achieved for the world as a whole, (iii) that the case detection rate reached 63% in 2007 and (iv) that the treatment success rate reached 85% in 2006.

3. Globally, there were an estimated 9.27 million incident cases of TB in 2007. This is an increase from 9.24 million cases in 2006, 8.3 million cases in 2000 and 6.6 million cases in 1990. Most of the estimated number of cases in 2007 were in Asia (55%) and Africa (31%), with small proportions of cases in the Eastern Mediterranean Region (6%), the European Region (5%) and the Region of the Americas (3%). The five countries that rank first to fifth in terms of total numbers of cases in 2007 are India (2.0 million), China (1.3 million), Indonesia (0.53 million), Nigeria (0.46 million) and South Africa (0.46 million). Of the 9.27 million incident TB cases in 2007, an estimated 1.37 million (15%) were HIV-positive; 79% of these HIV-positive cases were in the African Region and 11% were in the South-East Asia Region.

4. Although the total number of incident cases of TB is increasing in absolute terms as a result of population growth, the number of cases per capita is falling. The rate of decline is slow, at less than 1% per year. Globally, rates peaked at 142 cases per 100 000 population in 2004. In 2007, there were an estimated 139 incident cases per 100 000 population. Incidence rates are falling in five of the six WHO regions (the exception is the European Region, where rates are approximately stable).

5. There were an estimated 13.7 million prevalent cases of TB in 2007 (206 per 100 000 population), a decrease from 13.9 million cases (210 per 100 000 population) in 2006.

6. An estimated 1.3 million deaths occurred among HIV-negative incident cases of TB (20 per 100 000 population) in 2007. There were an additional 456 000 deaths among incident TB cases who were HIV-positive; these deaths are classified as HIV deaths in the International Statistical Classification of Diseases (ICD-10). The 456 000 deaths among HIV-positive incident TB cases equate to 33% of HIV-positive incident cases of TB and 23% of the estimated 2 million HIV deaths in 2007.

7. Prevalence and mortality rates are falling globally and in all six WHO regions. The Region of the Americas as well as the Eastern Mediterranean and South-East Asia regions are on track to achieve the Stop TB Partnership targets of halving prevalence and death rates by 2015, compared with a baseline of 1990. The Western Pacific Region is on track to halve the prevalence rate by 2015, but the mortality target may be narrowly missed. Neither the prevalence nor the mortality targets will be met in the African and European regions. The gulf between prevalence and mortality rates in 2007 and the targets in these two regions make it unlikely that 1990 prevalence and death rates will be halved by 2015 for the world as a whole.

8. The estimated numbers of HIV-positive TB cases and deaths in 2007 are approximately double the numbers published by WHO in previous years. This does not mean that the number of HIV-positive TB cases and the number of TB deaths among HIV-positive people doubled between 2006 and 2007. New data that became available in 2008, particularly from provider-initiated HIV testing in the African Region, were used (i) to estimate the numbers of cases and deaths in 2007 and (ii) to revise previous estimates of the numbers of cases and deaths that had occurred in earlier years. The numbers of HIV-positive TB cases and deaths are estimated to have peaked in 2005, at 1.39 million cases (15% of all incident cases) and 480 000 deaths.

9. The latest estimates of the numbers of HIV-positive TB cases and deaths were based, as usual, on estimates of HIV prevalence in the general population published by the Joint United Nations Programme on HIV/AIDS, or UNAIDS. The new data that became available in 2008 were direct measurements of the proportion of TB cases that are coinfected with HIV in 64 countries (up from 15 countries in 2007). These 64 direct measurements suggest that HIV-positive people are about 20 times more likely than HIV-negative people to develop TB in countries with a generalized HIV epidemic (compared with a previous estimate of six), and between 26 and 37 times more likely to develop TB in countries where HIV prevalence is lower (compared with a previous estimate of 30). These higher estimates were used to estimate the number of HIV-positive TB cases in countries for which direct measurements were not available.

10. There were an estimated 0.5 million cases of multidrug-resistant TB (MDR-TB) in 2007. There are 27 countries (of which 15 are in the European Region) that account for 85% of all such cases. The countries that rank first to fifth in terms of total numbers of MDR-TB cases are India (131 000), China (112 000), the Russian Federation (43 000), South Africa (16 000) and Bangladesh (15 000). By the end of 2008, 55 countries and territories had reported at least one case of extensively drug-resistant TB (XDR-TB).

11. The WHO Global Task Force on TB Impact Measurement has produced recommendations about how to measure progress in reducing rates of TB incidence, prevalence and mortality (the three major indicators of impact). These include systematic analysis of national and subnational notification data combined with improved surveillance systems to measure incidence, surveys of the prevalence of TB disease in 21 global focus countries between 2008 and 2015, and strengthening of vital registration systems to measure TB mortality among other causes of death. Implementation of Task Force recommendations is necessary to improve measurement of progress towards the global targets set for 2015 as well as to measure progress in TB control in subsequent years.

12. The Stop TB Strategy is WHO's recommended approach to reducing the burden of TB in line with global targets. The six major components of the strategy are: pursue high-quality DOTS expansion and enhancement; address TB/HIV, MDR-TB, and the needs of poor and vulnerable populations; contribute to health system strengthening based on primary health care; engage all care providers; empower people with TB, and communities through partnership; and enable and promote research. The Stop TB Partnership's Global Plan to Stop TB, 2006–2015 sets out the scale at which the interventions included in the Stop TB Strategy need to be implemented to achieve the 2015 targets.

13. In 2007, 5.5 million TB cases were notified by DOTS programmes (99% of total case notifications). This included 2.6 million smear-positive cases. The case detection rate of new smear-positive cases under DOTS (that is, the percentage of estimated incident cases that were notified and treated in DOTS programmes) was 63%, a small increase from 62% in 2006 but still 7% short of the target of ≥70% first set for 2000 (and later reset to 2005) by the World Health Assembly (WHA) in 1991. The target was met in 74 countries and in two regions – the Region of the Americas (73%) and the Western Pacific Region (77%). The South-East Asia Region (69%) almost met the target. The case detection rate was 60% in the Eastern Mediterranean Region, 51% in the European Region and 47% in the African Region.

14. Globally, the rate of treatment success for new smear-positive cases treated in DOTS programmes in 2006 reached the target of 85% first set by the WHA in 1991. Three regions – the Eastern Mediterranean (86%), Western Pacific (92%), and South-East Asia (87%) regions – met the target, as did 59 countries. The treatment success rate was 75% in the African Region and the Region of the Americas, and 70% in the European Region.

15. In 2006–2007, the Western Pacific Region and 36 countries met both the target of a case detection rate of at least 70% and the target of a treatment success rate of at least 85% for new smear-positive cases. The South-East Asia Region is close to achieving both targets. Kenya became the first country in sub-Saharan Africa to achieve both targets.

16. There has been major progress in implementing interventions such as testing TB patients for HIV and providing co-trimoxazole preventive therapy (CPT) and antiretroviral therapy (ART) to HIV-positive TB patients. Globally, 1 million TB patients (16% of notified cases) knew their HIV status in 2007. The greatest progress in HIV testing was in the African Region, where 0.5 million TB patients (37% of all notified cases) knew their HIV status in 2007. Of the 250 000 HIV-positive TB patients, 0.2 million were enrolled on CPT and 0.1 million were started on ART. In both cases, figures were higher than those reported to WHO in previous years.

17. Despite the progress that has been made with scaling up collaborative TB/HIV activities, progress in HIV testing is outpacing progress in the provision of CPT and ART. The number of HIV-positive TB patients being treated with CPT and ART is small compared with the 0.3 million TB patients known to be HIV-positive, and smaller still compared with the estimated 1.4 million HIV-positive TB cases (many of whom are not detected in DOTS programmes, given a case detection rate of 47%). Case detection in DOTS programmes as well as collaborative TB/HIV activities need to be expanded to ensure that (i) many more people know their HIV status and (ii) that those who are HIV-positive, with and without TB, have access to appropriate and timely treatment and care.

18. Globally, just under 30 000 cases of MDR-TB were notified to WHO in 2007, mostly by European countries and South Africa. This was 8.5% of the estimated global total of smear-positive cases of MDR-TB. Of the notified cases, 3681 were started on treatment in projects or programmes approved by the Green Light Committee (GLC), and are thus known to be receiving treatment according to international guidelines. This is equivalent to 1% of the estimated global total of smear-positive cases of MDR-TB. The number of patients started on treatment in GLC-approved projects and programmes is expected to increase to around 14 000 in 2009, equivalent to 4% of the smear-positive cases of MDR-TB estimated to exist globally. To meet the targets set in the Global Plan, diagnosis and treatment of MDR-TB need to be rapidly scaled up, especially in the three countries that account for 57% of global cases: China, India and the Russian Federation.

19. Diagnostic and treatment services for TB are integrated into primary health care in most countries.

20. National plans for TB control are aligned with national health strategies in more than half of the 22 high-burden countries (HBCs). Most NTPs are also involving other ministries, associations and institutions in the development of their plans. With renewed emphasis on health system strengthening, there is a strong basis for closer collaboration on key challenges such as sustainable financing, human resource development, infection control and health information systems.

21. The contribution of public–private mix (PPM) initiatives to detection and treatment of TB cases is difficult to quantify in most countries, but examples such as Pakistan and the Philippines (where public–private partnerships accounted for 19% and 8% of all notifications in 2007, respectively) illustrate their potential to contribute to increased case detection. The contribution of communities to diagnosis and treatment of TB is also hard to quantify. Many countries require guidance and support to design, implement and evaluate advocacy, communication and social mobilization activities (ACSM).

22. A total of US$ 3.0 billion is available for TB control in 2009 in 94 countries that reported data, and which account for 93% of the world's TB cases: of this total, 87% is funding from governments (including loans), 9% is funding from Global Fund grants and 4% is funding from donors other than the Global Fund. Most of the available funding is in the European Region (US$ 1.4 billion, mostly in the Russian Federation), followed by the African Region (US$ 0.6 billion) and the Western Pacific Region (US$ 0.3 billion). The funding gaps identified by these 94 countries amount to US$ 1.2 billion in 2009.

23. The total of US$ 4.2 billion required for full implementation of country plans in these 94 countries in 2009 is mostly for DOTS (US$ 3 billion, or 72%). The other major components are MDR-TB (US$ 0.5 billion, or 12%; 76% of the total for MDR-TB is accounted for by the Russian Federation and South Africa), collaborative TB/HIV activities (US$ 120 million, or 3%) and ACSM (US$ 100 million, or 2%). The remaining 11% includes PPM, surveys of the prevalence of TB disease, community-based TB care and a variety of miscellaneous activities.

24. In the 22 HBCs where 80% of the world's TB cases occur, a total of US$ 2.2 billion is available in 2009, a small increase of US$ 27 million compared with 2008 but substantially above the US$ 1.2 billion that was spent on

TB control in 2002 (when WHO began financial monitoring of TB control). Most of the increased funding since 2002 has come from domestic funding in Brazil, China and the Russian Federation, and external financing from the Global Fund. The HBCs reported a combined funding gap of US$ 0.5–0.7 billion in 2009 (the range reflects uncertainty about the level of funding from provincial governments in South Africa).

25. The total of US$ 2.9 billion required for full implementation of country plans in the 22 HBCs in 2009 is mostly for DOTS (US$ 2 billion, or 69%). The other major components are MDR-TB (US$ 0.4 billion, or 14%; 88% of this total is accounted for by the Russian Federation and South Africa), TB/HIV (US$ 90 million, or 3%) and ACSM (US$ 70 million, or 2%). The remaining 12% includes PPM, surveys of the prevalence of TB disease, community TB care and a variety of miscellaneous activities.

26. Of the US$ 2.2 billion available in the 22 HBCs in 2009, 88% is from HBC governments, 8% (US$ 169 million) is from the Global Fund and 4% (US$ 94 million) is from grants from sources other than the Global Fund. The distribution of funding sources is different when the Russian Federation and South Africa are excluded: the government contribution to available funding drops to 70%, the Global Fund contribution increases to 19% and grants from sources besides the Global Fund account for 11%.

27. The gap between the available funding reported by the 22 HBCs in 2009 and the funding requirements for these countries according to the Global Plan in 2009 is US$ 0.8 billion. The gap between the available funding reported by the 94 countries with 93% of global cases in 2009 and the funding required for these countries in 2009 according to the Global Plan is US$ 1.6 billion. Most of the extra funding required according to the Global Plan is for MDR-TB diagnosis and treatment in the South-East Asia and Western Pacific regions (mostly in India and China), and for DOTS and collaborative TB/HIV activities in Africa.

28. The global burden of TB is falling slowly, and at least three of six WHO regions are on track to achieve global targets for reducing the number of cases and deaths that have been set for 2015. However, while increasing numbers of TB cases have access to high-quality anti-TB treatment as well as to related interventions such as ART, an estimated 37% of incident TB cases are not being treated in DOTS programmes, up to 96% of incident cases with MDR-TB are not being diagnosed and treated according to international guidelines, the majority of HIV-positive TB cases do not know their HIV status and the majority of HIV-positive TB patients who do know their HIV status do not have access to ART. To accelerate progress in global TB control, these numbers need to be reduced using the range of interventions and approaches included in the Stop TB Strategy.

Introduction

This report is the 13th annual report on global control of tuberculosis (TB) published by the World Health Organization (WHO) in a series that started in 1997. Its main purpose is to provide a comprehensive and up-to-date assessment of the TB epidemic and to report on progress in controlling the disease at global, regional and country levels, in the context of global targets set for 2015. The principal targets are that the incidence of TB should be falling by 2015 (MDG Target 6.c), that TB prevalence and death rates should be halved by 2015 compared with their level in 1990, that at least 70% of incident smear-positive cases should be detected and treated in DOTS programmes, and that at least 85% of new sputum smear-positive cases should be successfully treated.[1,2,3,4] Results are based primarily on data reported to WHO via its standard TB data collection form in 2008 and on the data that were collected each year 1996–2007. The 196 countries and territories that reported data in 2008 account for 99.6% of the world's estimated TB cases and 99.7% of the world's population.

The report is structured in three major chapters.

CHAPTER 1 focuses on epidemiology. It includes WHO's latest estimates of the epidemiological burden of TB (incidence, prevalence and mortality), case notifications reported for 2007, estimates of the case detection rate for new smear-positive cases as well as for all types of case between 1995 (when reliable monitoring began) and 2007, and treatment outcomes between 1994 and 2006 for new and re-treatment cases. Particular attention is given to two topics. The first is updated estimates of the numbers of TB cases and deaths among HIV-positive people, which have been revised substantially upwards using new data that became available in 2008. The second is recent recommendations about how to improve measurement of the epidemiological burden of TB and monitoring of progress towards impact targets (i.e. reductions in incidence, prevalence and mortality) from 2009 onwards, which have been made by WHO's Global Task Force on TB Impact Measurement.

CHAPTER 2 analyses progress in implementing WHO's Stop TB Strategy, which is designed to achieve the global targets set for 2015.[5] The strategy was launched in 2006 and is built on the foundations of the DOTS strategy, the internationally-recommended approach to TB control advocated by WHO from the mid-1990s until 2005. The six major components of the strategy (DOTS implementation; addressing TB/HIV, MDR-TB and the needs of poor and vulnerable populations; contributing to health-system strengthening based on primary health care; engaging all care providers; empowering people with TB, and communities; and promoting research) are addressed in turn. Wherever possible, comparisons are made with the targets for scaling up interventions that were set in the Stop TB Partnership's Global Plan to Stop TB. Examples of how different components of the strategy can be implemented based on recent country experience and which have wider applicability are also highlighted. These include scaling up public–private collaboration in Pakistan, treatment of multidrug-resistant TB (MDR-TB) in Estonia and Latvia, introducing electronic recording and reporting in Myanmar, and provision of antiretroviral treatment (ART) in Africa.

CHAPTER 3 analyses financing for TB control. The data presented include the budgets of national TB control programmes (NTPs), and available funding and funding gaps for these budgets, between 2002 (when reliable monitoring began) and 2009; estimates of the total costs of TB control, which include NTP budgets plus the costs associated with use of general health-system staff and infrastructure that are usually not included in NTP budgets; comparisons of funding needs set out in the Global Plan with countries' assessments of their funding needs; per patient costs and budgets; and expenditures compared with available funding and changes in the number of patients treated. Progress with planning and budgeting for TB control and the possible consequences of the global financial crisis that developed in 2008 are also highlighted.

The main part of the report ends with a summary of the major conclusions from all three chapters (CONCLUSIONS). The remainder of the report consists of four annexes. These include country profiles for the 22 high-burden countries (ANNEX 1), an explanation of methods (ANNEX 2), country-specific data for 1990–2007 (ANNEX 3), and a summary of the countries where surveys of the prevalence of TB disease have been conducted or are planned and the countries for which mortality data from vital registration systems are available in a central WHO database (ANNEX 4).

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[1] The Millennium Development Goals are described in full at unstats.un.org/unsd

[2] Resolution WHA44.8. Tuberculosis control programme. In: *Handbook of resolutions and decisions of the World Health Assembly and the Executive Board*. Volume III, 3rd ed. (1985–1992). Geneva, World Health Organization, 1993 (WHA44/1991/REC/1).

[3] *Stop Tuberculosis Initiative. Report by the Director-General*. Fifty-third World Health Assembly. Geneva, 15–20 May 2000 (A53/5, 5 May 2000).

[4] Dye C et al. Targets for global tuberculosis control. *International Journal of Tuberculosis and Lung Disease*, 2006, 10:460–462.

[5] Raviglione MC, Uplekar MW. WHO's new Stop TB Strategy. *Lancet*, 2006, 367:952–955.

[6] *The Global Plan to Stop TB, 2006–2015*. Stop TB Partnership and WHO. Geneva, World Health Organization, 2006 (WHO/HTM/STB/2006.35).

CHAPTER 1

Epidemiology

WHO has assessed the status of the TB epidemic and progress in control of the disease every year since 1997. This assessment has included estimates of TB incidence, prevalence and mortality (from 1990 onwards); analysis of case notifications (from 1995) and treatment outcomes (from 1994) in around 200 (of 212) countries and territories, following the start of reliable recording and reporting in 1995; and analysis of progress towards the global targets for case detection and treatment success established by the World Health Assembly (WHA) in 1991. Since 2006, WHO has also assessed progress towards achieving the impact targets related to incidence, prevalence and mortality that have been set for 2015 within the framework of the Millennium Development Goals (MDGs) and by the Stop TB Partnership.

This chapter provides WHO's latest assessment of the status of the TB epidemic and progress towards achieving the global targets using data reported by 196 countries and territories (accounting for 99.6% of the world's estimated number of TB cases and 99.7% of the world's population) in 2008 as well as data reported in previous years. It is structured in seven major sections. The first defines the global targets and indicators for TB control set for 2005, 2015 and 2050. The second section presents the latest estimates of TB incidence, prevalence and mortality, including estimates for 2007 and for the period since 1990, and discusses whether the world as a whole and specific regions are on track to reach the 2015 MDG and Stop TB Partnership targets. The estimates of TB incidence and mortality include important updates to previously published estimates of the numbers of HIV-positive TB cases and deaths. Building on the second section, the third section provides an overview of recent recommendations from the WHO Global Task Force on TB Impact Measurement about how to measure progress towards the 2015 impact targets. These recommendations focus on strengthening surveillance (of cases and deaths) in all countries and on implementing surveys of the prevalence of TB disease in 21 global focus countries. Recent examples of how the recommendations can be applied in practice are provided. The fourth section presents TB notification data for 2007, including for men and women separately. The fifth section includes the latest estimates of the case detection rate, the sixth section reports treatment outcomes in 2006, and the seventh section assesses regional and country progress towards achieving the targets for both case detection and treatment success. The chapter ends with a summary of the main results and conclusions.

The methods used to produce the results presented in this chapter are explained in ANNEX 2. Throughout this chapter, particular attention is given to the 22 high-burden countries (HBCs) that collectively account for 80% of incident TB cases globally. Additional data are provided for HBCs in ANNEX 1 and for all countries in ANNEX 3.

1.1 Goals, targets and indicators for TB control

The global targets and indicators for TB control were developed within the framework of the MDGs as well as by the Stop TB Partnership and the WHA (TABLE 1.1).[1,2] The impact targets are to halt and begin to reverse the incidence of TB by 2015 and to reduce by 50% prevalence and mortality rates by 2015 relative to 1990 levels. The incidence target is part of MDG Target 6.c, while the targets for reducing prevalence and death rates were based on a resolution of the year 2000 meeting of the Group of Eight (G8) industrialized countries, held in Okinawa, Japan. The outcome targets – to achieve a case detection rate of new smear-positive cases of at least 70% and to reach a treatment success rate of at least 85% for such cases – were first established by the WHA in 1991. Within the MDG framework, these indicators were defined as the proportion of cases detected and cured under DOTS. The ultimate goal of eliminating TB, defined as the occurrence of less than 1 case per million population per year by 2050, was set by the Stop TB Partnership.

The Stop TB Strategy,[3] launched by WHO in 2006, sets out the major interventions that should be implemented to achieve the MDG, Stop TB Partnership and WHA targets. These are divided into six broad components: (i) pursuing high-quality DOTS expansion and enhancement; (ii) addressing TB/HIV, MDR-TB and the needs of poor and vulnerable populations; (iii) contributing to health-system strengthening based on primary health care; (iv) engaging all care providers; (v) empowering people with TB, and communities through partnership; and (vi) enabling and promoting research. The Global Plan to Stop TB, launched by the Stop TB Partnership in 2006, sets out how, and at what scale, the Stop TB Strategy should be implemented over the decade 2006–2015, and the funding requirements.[2] This means that in addition to the targets shown in TABLE 1.1, the Global Plan also includes input targets (funding required per year) and output targets (for example, the number of patients with MDR-TB who should be

[1] Dye C et al. Targets for global tuberculosis control. *International Journal of Tuberculosis and Lung Disease*, 2006, 10:460–462.

[2] *The Global Plan to Stop TB, 2006–2015: actions for life towards a world free of tuberculosis*. Geneva, World Health Organization, 2006 (WHO/HTM/STB/2006.35).

[3] *The Stop TB Strategy: building on and enhancing DOTS to meet the TB-related Millennium Development Goals*. Geneva, World Health Organization, 2006 (WHO/HTM/TB/2006.368).

TABLE 1.1
Goals, targets and indicators for TB control

HEALTH IN THE MILLENNIUM DEVELOPMENT GOALS

Goal 6: Combat HIV/AIDS, malaria and other diseases

Target 6c: Halt and begin to reverse the incidence of malaria and other major diseases
Indicator 6.9: Incidence, prevalence and death rates associated with TB
Indicator 6.10: Proportion of TB cases detected and cured under DOTS

Stop TB Partnership targets

By 2005: At least 70% of people with sputum smear-positive TB will be diagnosed (i.e. under the DOTS strategy), and at least 85% successfully treated. The targets of a case detection rate of at least 70% and a treatment success rate of at least 85% were first set by the World Health Assembly of WHO in 1991.
By 2015: The global burden of TB (per capita prevalence and death rates) will be reduced by 50% relative to 1990 levels.
By 2050: The global incidence of active TB will be less than 1 case per million population per year.

treated each year, number of TB patients to be tested for HIV, number of HIV-positive TB patients who should be enrolled on antiretroviral therapy (ART)).

This chapter focuses on the five principal indicators that are used to measure the impact and outcomes of TB control: incidence, prevalence and deaths (impact indicators), and case detection and treatment success rates (outcome indicators). An analysis of progress towards achieving other targets is provided in CHAPTER 2 and CHAPTER 3.

1.2 TB incidence, prevalence and mortality

1.2.1 Incidence

Based on surveillance and survey data (ANNEXES 2, 3 and 4), WHO estimates that 9.27 million new cases of TB occurred in 2007 (139 per 100 000 population), compared with 9.24 million new cases (140 per 100 000 population) in 2006. Of these 9.27 million new cases, an estimated 44% or 4.1 million (61 per 100 000 population) were new smear-positive cases (TABLE 1.2; FIGURE 1.1). India, China, Indo-

TABLE 1.2
Estimated epidemiological burden of TB, 2007

		INCIDENCE[a]				PREVALENCE[a]		MORTALITY				
		ALL FORMS		SMEAR-POSITIVE		ALL FORMS		HIV-NEGATIVE		HIV-POSITIVE		HIV PREV. IN INCIDENT TB CASES[b]
	POPULATION 1000s	NUMBER 1000s	PER 100 000 POP PER YEAR	NUMBER 1000s	PER 100 000 POP PER YEAR	NUMBER 1000s	PER 100 000 POP PER YEAR	NUMBER 1000s	PER 100 000 POP PER YEAR	NUMBER 1000s	PER 100 000 POP PER YEAR	%
1 India	1 169 016	1 962	168	873	75	3 305	283	302	26	30	2.5	5.3
2 China	1 328 630	1 306	98	585	44	2 582	194	194	15	6.8	0.5	1.9
3 Indonesia	231 627	528	228	236	102	566	244	86	37	5.4	2.4	3.0
4 Nigeria	148 093	460	311	195	131	772	521	79	53	59	40	27
5 South Africa	48 577	461	948	174	358	336	692	18	38	94	193	73
6 Bangladesh	158 665	353	223	159	100	614	387	70	44	0.4	0.3	0.3
7 Ethiopia	83 099	314	378	135	163	481	579	53	64	23	28	19
8 Pakistan	163 902	297	181	133	81	365	223	46	28	1.4	0.9	2.1
9 Philippines	87 960	255	290	115	130	440	500	36	41	0.3	0.3	0.3
10 DR Congo	62 636	245	392	109	174	417	666	45	72	6.0	10	5.9
11 Russian Federation	142 499	157	110	68	48	164	115	20	14	5.1	3.6	16
12 Viet Nam	87 375	150	171	66	76	192	220	18	20	3.1	3.5	8.1
13 Kenya	37 538	132	353	53	142	120	319	10	26	15	39	48
14 Brazil	191 791	92	48	49	26	114	60	5.9	3.1	2.5	1.3	14
15 UR Tanzania	40 454	120	297	49	120	136	337	12	29	20	49	47
16 Uganda	30 884	102	330	42	136	132	426	13	41	16	52	39
17 Zimbabwe	13 349	104	782	40	298	95	714	6.9	52	28	213	69
18 Thailand	63 884	91	142	39	62	123	192	10	15	3.9	6.0	17
19 Mozambique	21 397	92	431	37	174	108	504	10	45	17	82	47
20 Myanmar	48 798	83	171	37	75	79	162	5.4	11	0.9	1.9	11
21 Cambodia	14 444	72	495	32	219	96	664	11	77	1.8	13	7.8
22 Afghanistan	27 145	46	168	21	76	65	238	8.2	30	0.0	0	0
High-burden countries	**4 201 761**	**7 423**	**177**	**3 245**	**77**	**11 301**	**269**	**1 058**	**25**	**339**	**8.1**	**14**
AFR	792 378	2 879	363	1 188	150	3 766	475	357	45	378	48	38
AMR	909 820	295	32	157	17	348	38	33	3.6	7.9	0.9	11
EMR	555 064	583	105	259	47	772	139	97	17	7.7	1.4	3.5
EUR	889 278	432	49	190	21	456	51	56	6.3	8.1	0.9	9.8
SEAR	1 745 394	3 165	181	1 410	81	4 881	280	497	28	40	2.3	4.6
WPR	1 776 440	1 919	108	859	48	3 500	197	276	16	15	0.8	2.7
Global	**6 668 374**	**9 273**	**139**	**4 062**	**61**	**13 723**	**206**	**1 316**	**20**	**456**	**6.8**	**15**

[a] Incidence and prevalence estimates include TB in people with HIV.
[b] Prevalence of HIV in incident TB cases of all ages.

FIGURE 1.1
Estimated number of new TB cases, by country, 2007

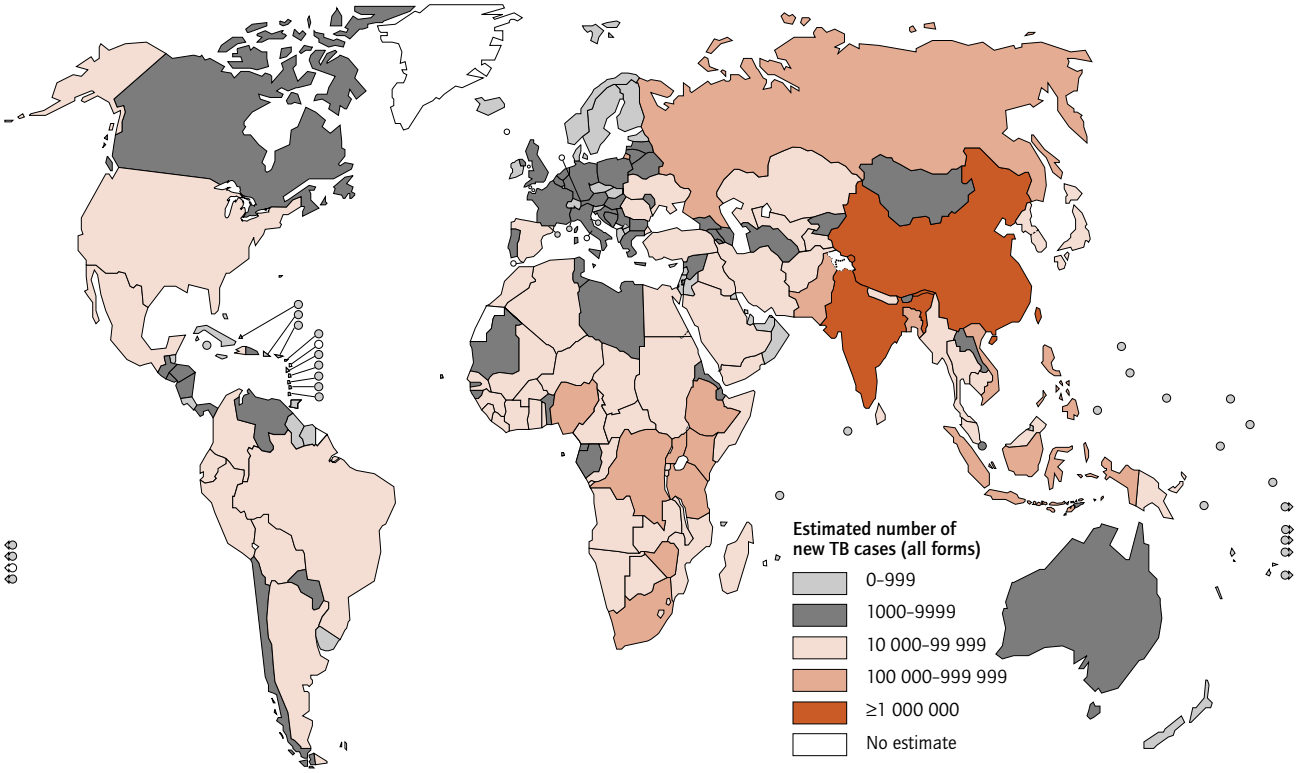


FIGURE 1.2
Estimated TB incidence rates, by country, 2007

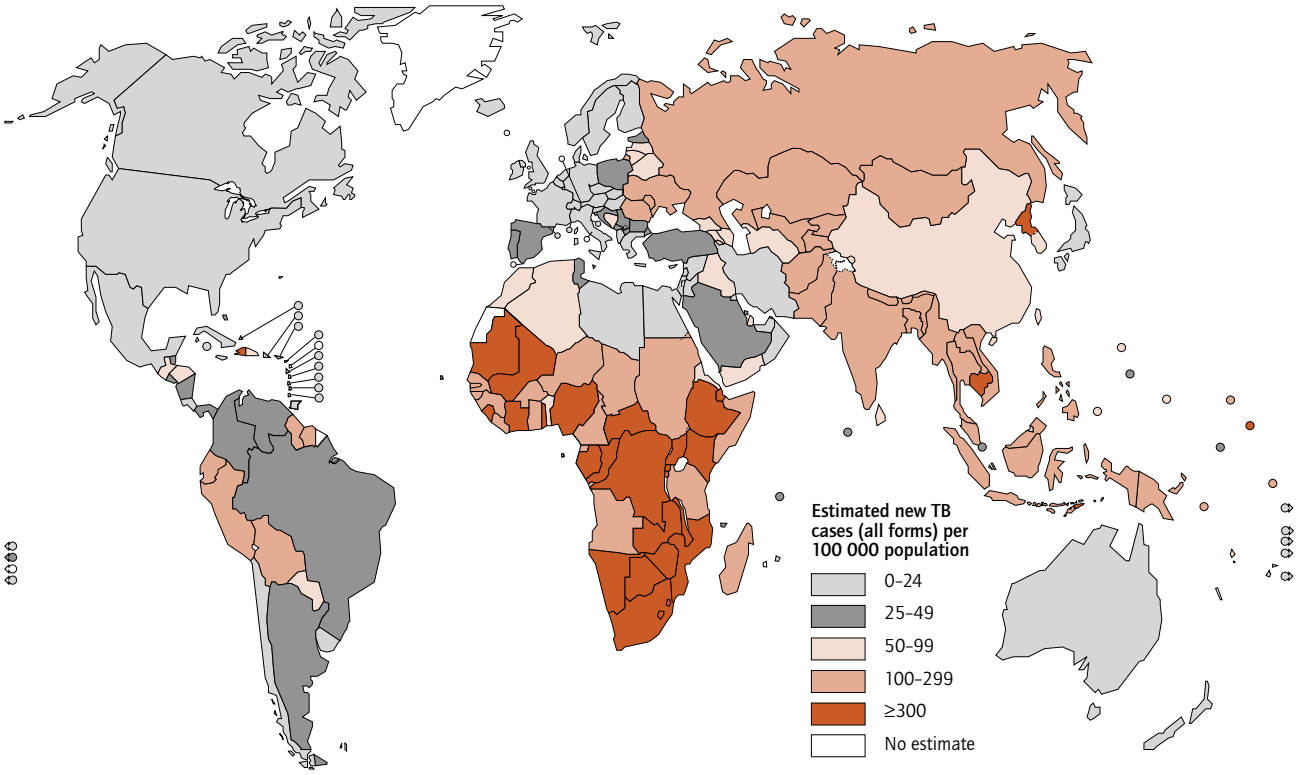
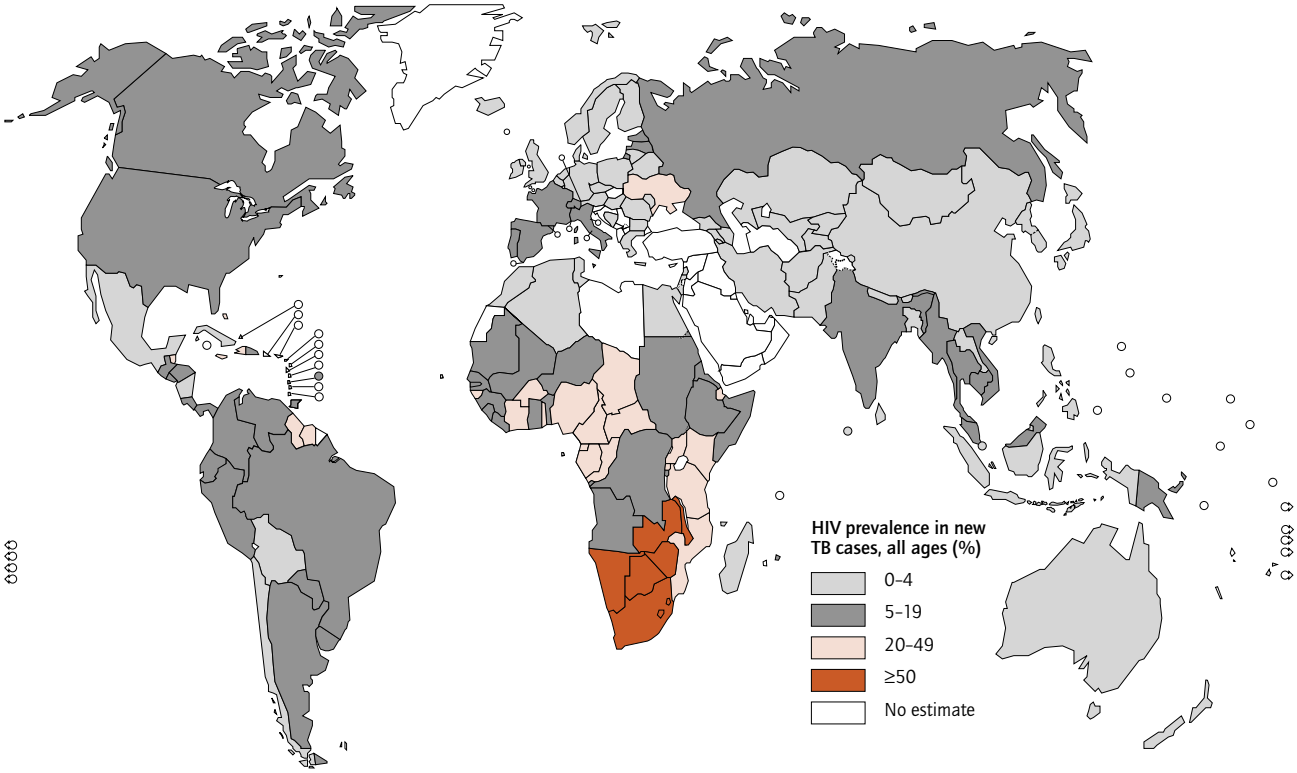


FIGURE 1.3
Estimated HIV prevalence in new TB cases, 2007

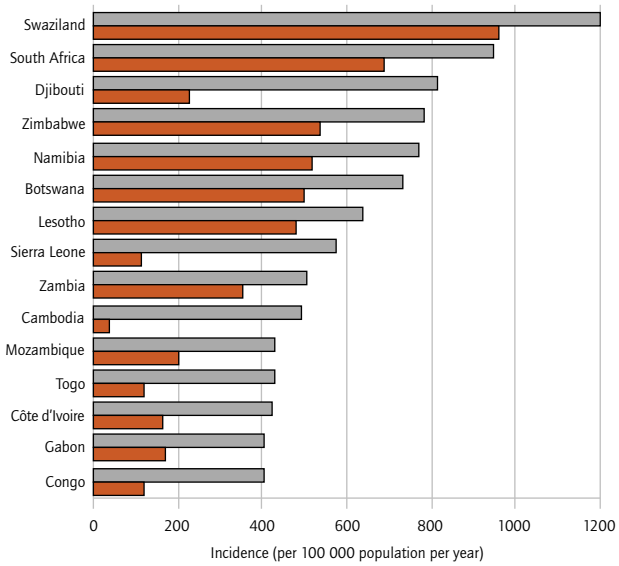


nesia, Nigeria and South Africa rank first to fifth in terms of the total number of incident cases; the estimated numbers of cases in these and other HBCs in 2007 are also shown in TABLE 1.2. Asia (the South-East Asia and Western Pacific regions) accounts for 55% of global cases and the African Region for 31%; the other three regions (the Americas, European and Eastern Mediterranean regions) account for small fractions of global cases. The magnitude of the TB burden within countries can also be expressed as the number of incident cases per 100 000 population (FIGURE 1.2). Among the 15 countries with the highest estimated TB incidence rates, 13 are in Africa, a phenomenon linked to high rates of HIV coinfection (FIGURE 1.3; FIGURE 1.4).

Incidence of TB among people infected with HIV

Among the 9.27 million incident cases of TB in 2007, an estimated 1.37 million (14.8%) were HIV-positive (TABLE 1.2). This number, although double the estimate of 0.7 million cases in 2006 that WHO published in 2008,[1] does not mean that the number of HIV-positive cases of TB doubled between 2006 and 2007; rather, new data that became available during 2008 have been used to estimate both the number of HIV-positive TB cases in 2007 and to revise estimates of the number of such cases that occurred in previous years. The global number of incident HIV-positive TB cases is estimated to have peaked in 2005, at 1.39 million. In 2007, as in previous years, the African Region accounted for most (79%)

FIGURE 1.4
Fifteen countries with the highest estimated TB incidence rates per capita (all forms; grey bars) and corresponding incidence rates of HIV-positive TB cases (red bars), 2007



[1] *Global tuberculosis control: surveillance, planning, financing. WHO report 2008*. Geneva, World Health Organization, 2008 (WHO/HTM/TB/2008.393).

BOX 1.1

Revising estimates of the numbers of TB cases and deaths among HIV-positive people

This report includes estimates of the numbers of HIV-positive TB cases and deaths that are substantially higher than those published in previous years. It is estimated that, in 2007, there were 1.37 million incident cases of HIV-positive TB (14.8% of total incident cases) and 456 000 deaths from TB among HIV-positive people (equivalent to 26% of deaths from TB in HIV-positive and HIV-negative people, and 23% of an estimated 2 million HIV-related deaths).[1]

These estimated numbers of TB cases and deaths among HIV-positive people in 2007 are approximately double those published in previous reports. This does not mean that the numbers of HIV-positive TB cases and TB deaths among HIV-positive people doubled between 2006 and 2007. Instead, new data that became available during 2008 have been used to estimate both (i) the numbers of HIV-positive TB cases and deaths in 2007 and (ii) to revise previous estimates of the numbers of cases and deaths that occurred in earlier years. The revised estimates suggest that the number of HIV-positive TB cases and deaths peaked in 2005 at 1.39 million incident cases (15.1% of total incident cases) and 480 000 deaths.

As for previous reports in this series, the estimates are based on the latest global estimates of HIV prevalence among the general population (all ages) published by the Joint United Nations Programme on HIV/AIDS (UNAIDS).[1] What is new for this report is that direct measurements of the prevalence of HIV in TB patients were available from a much larger number of countries. These direct measurements were mostly from provider-initiated HIV testing of TB patients (49 countries, up from 13 countries in the previous year). Provider-initiated HIV testing has been rapidly expanded since 2005–2006, notably in African countries (see also CHAPTER 2). For a further 15 countries, direct measurements were available from surveys or sentinel surveillance (up from two countries in the previous year). These 64 direct measurements were used to estimate the number of incident HIV-positive TB cases in 64 countries that account for 32% of the estimated total of 1.37 million HIV-positive TB cases.

These direct measurements provide strong evidence that the relative risk of developing TB in HIV-positive people as compared with HIV-negative people (the incidence rate ratio, or IRR) is higher than previously estimated. The IRR was estimated as 20.6 (95% confidence interval (CI) 15.4–27.5) in 2007 in countries with a generalized HIV epidemic (i.e. countries where the prevalence of HIV is above 1% in the general population), as 26.7 (95% CI 20.4–34.9) in countries where the prevalence of HIV in the general population is between 0.1% and 1%, and 36.7 (95% CI 11.6–116) in countries where the prevalence of HIV in the general population is less than 0.1%. These IRR estimates compare with previous estimates of 6, 6 and 30, respectively.[2] Higher estimates are consistent with reductions in the estimates of HIV prevalence in the general population published in 2007 by UNAIDS (which by definition lead to an increase in previous IRR estimates for any given level of HIV prevalence among TB patients) and with evidence that the IRR increases as the HIV epidemic matures. The wide confidence intervals around these IRRs illustrate that large uncertainty remains, although the greatest uncertainty is for countries with a low HIV prevalence that have only a small impact on global estimates. The new IRR figures were used to produce indirect estimates of the number of HIV-positive TB cases in 104 countries for which direct measurements of the prevalence of HIV in TB patients were not available.

To increase the reliability of these estimates, the coverage of HIV surveillance among TB patients needs to be improved. Furthermore, indirect methods will become more problematic as the coverage and impact of antiretroviral therapy (ART) increases. More data are needed, particularly from national HIV programmes, to better understand the impact of ART on the incidence of TB.

[1] http://www.unaids.org/en/KnowledgeCentre/HIVData/Epidemiology/latestEpiData.asp

[2] These earlier estimates of the IRR were based on a thorough review of the evidence conducted in 2000–2001. See Corbett EL et al. The growing burden of tuberculosis: global trends and interactions with the HIV epidemic. *Archives of Internal Medicine*, 2003, 163:1009–1021.

HIV-positive TB cases, followed by the South-East Asia Region (mainly India) with 11% of total cases (FIGURE 1.5). South Africa accounted for 31% of cases in the African Region.

As for earlier reports in this series, the new estimates were produced using the latest global estimates of HIV prevalence among the general population (all ages) published by the Joint United Nations Programme on HIV/AIDS (UNAIDS).[1] There are two new and related changes to the data and methods used for this report. First, direct measurements of the prevalence of HIV in TB patients were available from a much larger number of countries (from provider-initiated HIV testing in 49 countries and surveys or sentinel surveillance in 15 countries). Second, these direct measurements suggest that the risk of developing TB in HIV-positive people compared with HIV-negative people (the incidence rate ratio, or IRR) is higher than previously estimated (for example, 20.6 compared with the previous estimate of 6 in countries with a high prevalence of HIV in the general population). New and higher estimates of the IRR were used to produce indirect estimates of the number of HIV-positive TB cases in 104 countries for which direct measurements of the prevalence of HIV in TB patients were not available.[2] The new estimates and associated data and methods are summarized in BOX 1.1 and explained in more detail in ANNEX 2. Estimates for all countries are included in ANNEX 3.

Estimated incidence of MDR-TB

Estimates of the burden of multidrug resistant TB (MDR-TB) are presented by country, disaggregated by smear status, in ANNEX 3. Most of the current information about the proportion of TB cases with MDR-TB comes from drug susceptibility testing (DST) of samples from patients in whom MDR-TB is diagnosed in public health facilities under conditions defined by the WHO/IUATLD Global Project on Drug Resistance Surveillance (DRS).[3] These conditions include documented satisfactory performance of laboratories based on external quality assurance (EQA) and an adequate record of every patient's treatment history. Such data are available for new and re-treatment cases for 113 and 102 countries, respectively. Using a set of widely measurable, independent variables that are predictive of the frequency of MDR-TB (such as gross national income (GNI)

[1] http://www.unaids.org/en/KnowledgeCentre/HIVData/Epidemiology/latestEpiData.asp

[2] UNAIDS does not produce estimates of HIV prevalence in the general population for the remaining 44 countries and territories. For this reason, estimates of the number of HIV-positive TB cases in these countries and territories were not produced.

[3] *Anti-tuberculosis drug resistance in the world, 4th report: the WHO/IUATLD Global Project on Anti-tuberculosis Drug Resistance Surveillance*. Geneva, World Health Organization, 2008 (WHO/HTM/TB/2008.394).

FIGURE 1.5
Geographical distribution of estimated number of HIV-positive TB cases, 2007. For each country (red circles) and WHO region (grey circles), the number of incident TB cases arising in people with HIV is shown as a percentage of the global total of such cases.

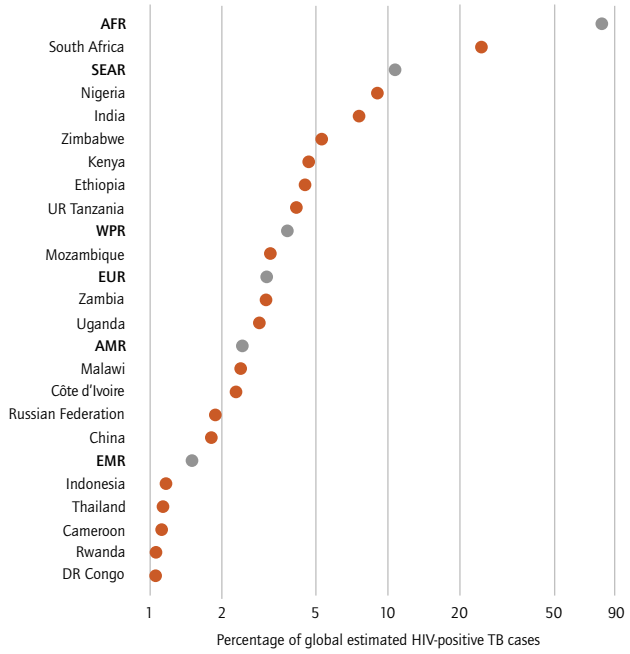
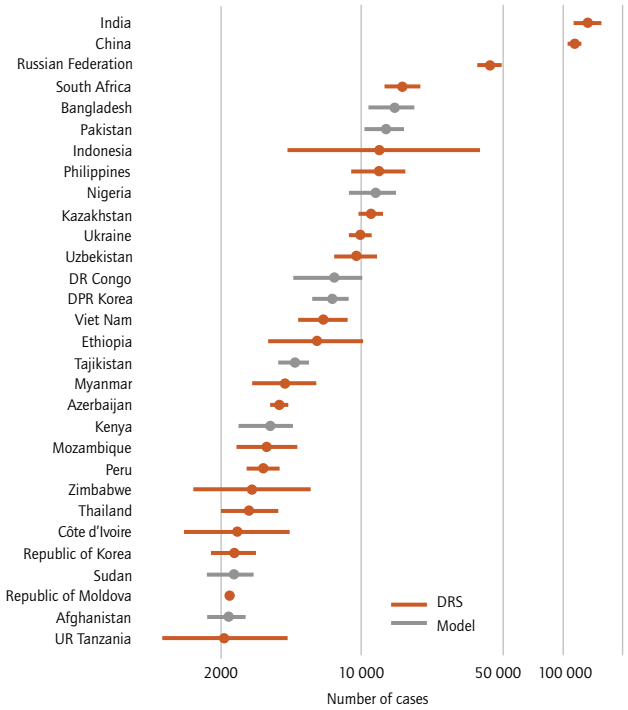


FIGURE 1.6
Countries with the highest numbers of estimated MDR-TB cases, 2007. Horizontal lines denote 95% confidence intervals. The source of estimates is drug resistance surveillance or surveys (DRS, in red) or modelling (in grey).



per capita, the ratio of re-treatment to new patients, and the failure rate associated with first-line treatments), it is possible to estimate the frequency of MDR-TB in countries where it has not been measured directly. The general methods used to produce these estimates are presented in ANNEX 2, while ANNEX 3 defines whether the direct or indirect method was used for each country.

In 2007, there were an estimated 9.27 million first episodes of TB and an additional 1.16 million subsequent episodes of TB (episodes occurring in patients who had already experienced at least one previous episode of TB in the past and who had received at least one month of anti-TB treatment). Among these, 10.4 million episodes of TB (first and subsequent), an estimated 4.9% or 511 000 were cases of MDR-TB. Of these, 289 000 were among new cases (3.1% of all new cases) and 221 000 were among cases that had been previously treated for TB (19% of all previously treated cases). Of the 511 000 incident cases of MDR-TB in 2007, 349 000 (68%) were smear-positive. The countries with the largest number of cases of MDR-TB, ranked in decreasing order, are shown in FIGURE 1.6.

Trends in incidence since 1990 and progress towards MDG Target 6.c

From series of notification data and surveys (ANNEXES 2, 3 and 4), the global incidence of TB per capita appears to have peaked in 2004 and is now in decline (FIGURE 1.7; FIGURE 1.8). This peak and subsequent decline follow a similar pattern to the trend in HIV prevalence in the general population (FIGURE 1.7). The reason why the number of incident cases

FIGURE 1.7
Estimated incidence of TB and prevalence of HIV for the African subregion most affected by HIV (Africa high-HIV), 1990–2007

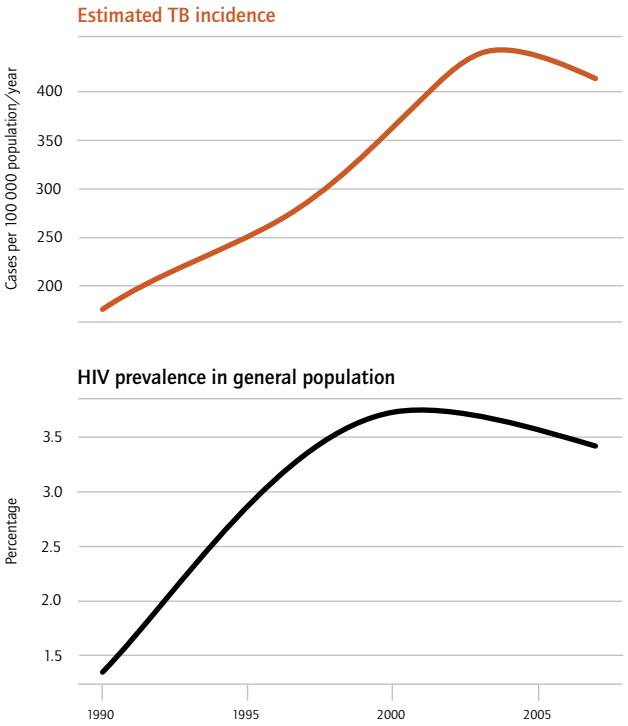
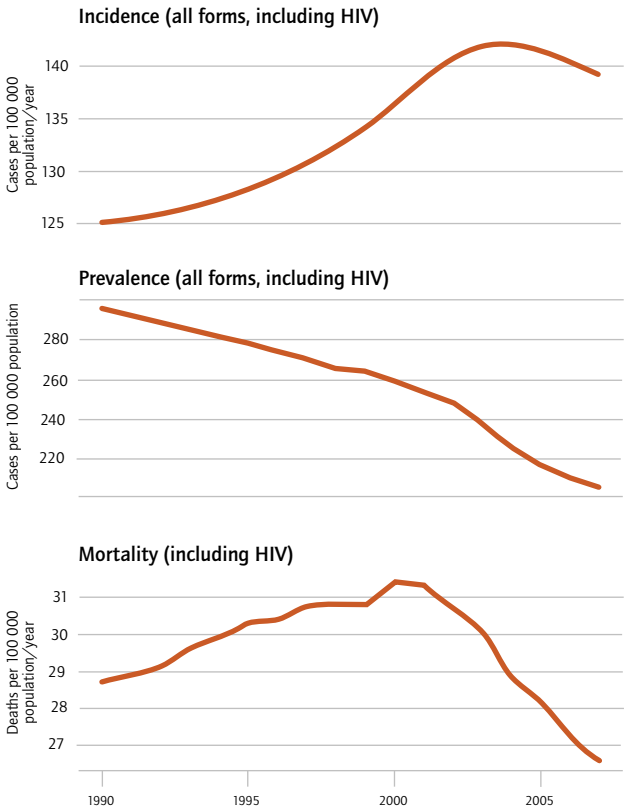


FIGURE 1.8
Global rates of TB incidence, prevalence and mortality, including in people with HIV, 1990–2007



in absolute terms is increasing (see above), while incidence rates per capita are falling, is population growth. In the African, Eastern Mediterranean, European and South-East Asia regions, the decline in incidence per capita is more than compensated for by increases in population size.

Trends in incidence rates vary among regions (FIGURE 1.9). Rates are falling in seven of nine epidemiological subregions (see ANNEX 2 for definition of the countries in each subregion), stable in Eastern Europe and increasing in African countries with a low prevalence of HIV. Among the WHO regions, incidence is falling slowly in all regions except the European Region, where it is approximately stable. When the time periods 1995–1999 and 2005–2007 are compared, the estimated average rate of change in TB incidence (all forms) per 100 000 population was fastest in African countries with high HIV prevalence and in the Eastern European subregion (FIGURE 1.10). The rate at which incidence was declining slowed in the Central European subregion and, to a lesser extent, in the Eastern Mediterranean subregion. In the other subregions, incidence was falling at a similar rate in both time periods.

The continued fall in the global incidence rate reinforces data presented in the last two reports in this series.[1] If verified by further monitoring, the data show that MDG target 6.c was met by 2005 (incidence rates peaked in 2004), well ahead of the target date of 2015.

1.2.2 Prevalence

There were an estimated 13.7 million prevalent cases in 2007 (206 per 100 000 population), a slight decrease from 13.9 million in 2006 (TABLE 1.2). Of these 13.7 million prevalent cases, an estimated 687 000 (5%) were HIV-positive. From trends in TB incidence combined with assumptions about the duration of disease in different categories of case (ANNEX 2), the global prevalence of TB is estimated to have been in decline since 1990 (FIGURE 1.8). This decline is in contrast to the rise in TB incidence in the 1990s, which can be explained by a decrease in the average duration of disease as the fraction of cases treated in DOTS programmes increased, combined with a comparatively short duration of disease among HIV-positive cases (which has partly compensated for an increase in the incidence of HIV-positive TB cases).

Regional trends in TB prevalence from 1990 to 2007 as well as projections up to 2015 (based on extrapolation of the trend in 2005–2007) are shown in FIGURE 1.11. Prevalence has been declining in the Eastern Mediterranean Region, the Region of the Americas, the South-East Asia Region and the Western Pacific Region since 1990, and all four regions are on track to at least halve prevalence rates by 2015 (prevalence has already halved compared with the 1990 level in the Region of the Americas). In the African and European regions, prevalence rates increased substantially during the 1990s, and by 2007 were still far above the 1990 level in the African Region and just back to the 1990 level in the European Region. Projections indicate that neither region will reach the target of halving the 1990 prevalence rate by 2015, and in the African Region it is unlikely that prevalence will be back to 1990 levels by 2015. The gap between the 2015 targets and current prevalence rates in these two regions mean that the world as a whole is unlikely to meet the Stop TB Partnership target of halving the prevalence rate by 2015.

1.2.3 Mortality

An estimated 1.32 million HIV-negative people (19.7 per 100 000 population) died from TB in 2007, and there were an additional 456 000 TB deaths among HIV-positive people (TABLE 1.2).[2] Revisions in the estimated number of incident cases of TB that are coinfected with HIV (SECTION 1.2.1; BOX 1.1) explain why the estimates of TB deaths among HIV-positive people are higher than those published in 2008.[3] Deaths from TB among HIV-positive people account for 23% of the estimated 2 million HIV deaths that occurred in 2007 (BOX 1.1).[4]

Revisions to estimates of the number of incident cases of TB that are HIV-positive before 2007 have also led to upward

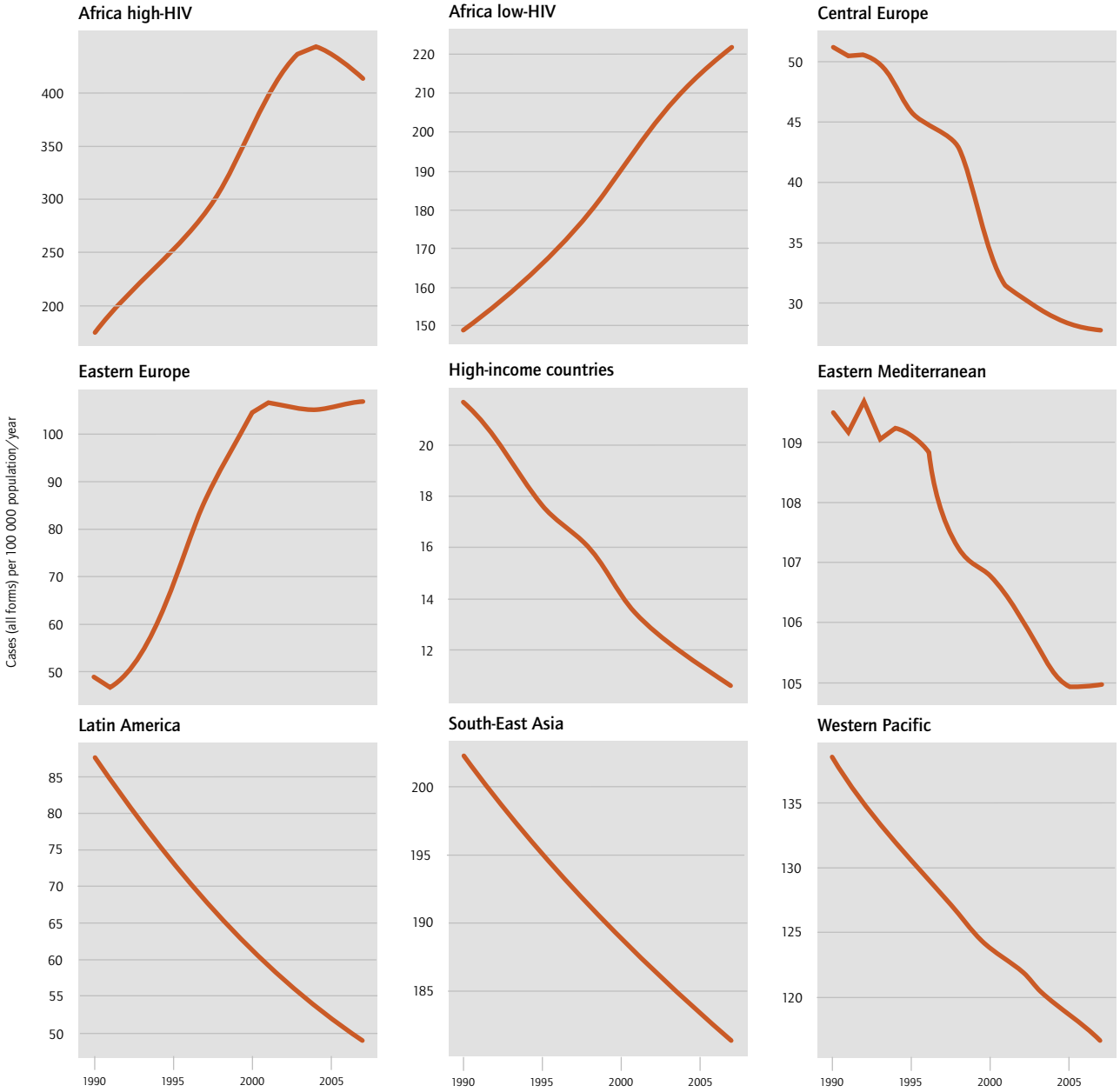
[1] *Global tuberculosis control: surveillance, planning, financing. WHO report 2007. Geneva, World Health Organization, 2007* (WHO/HTM/TB/2007.376); *Global tuberculosis control: surveillance, planning, financing. WHO report 2008*. Geneva, World Health Organization, 2008 (WHO/HTM/TB/2008.393).

[2] Estimates of TB deaths in HIV-positive and HIV-negative people are presented separately because TB deaths in HIV-positive people are classified as HIV deaths in the International Statistical Classification of Diseases (ICD-10).

[3] Of the 456 000 TB deaths among HIV-positive people in 2007, an estimated 226 000 were cases that were treated and 230 000 were untreated cases.

[4] http://www.unaids.org/en/KnowledgeCentre/HIVData/Epidemiology/latestEpiData.asp

FIGURE 1.9
Trends in estimated incidence rates in nine subregions, 1990–2007

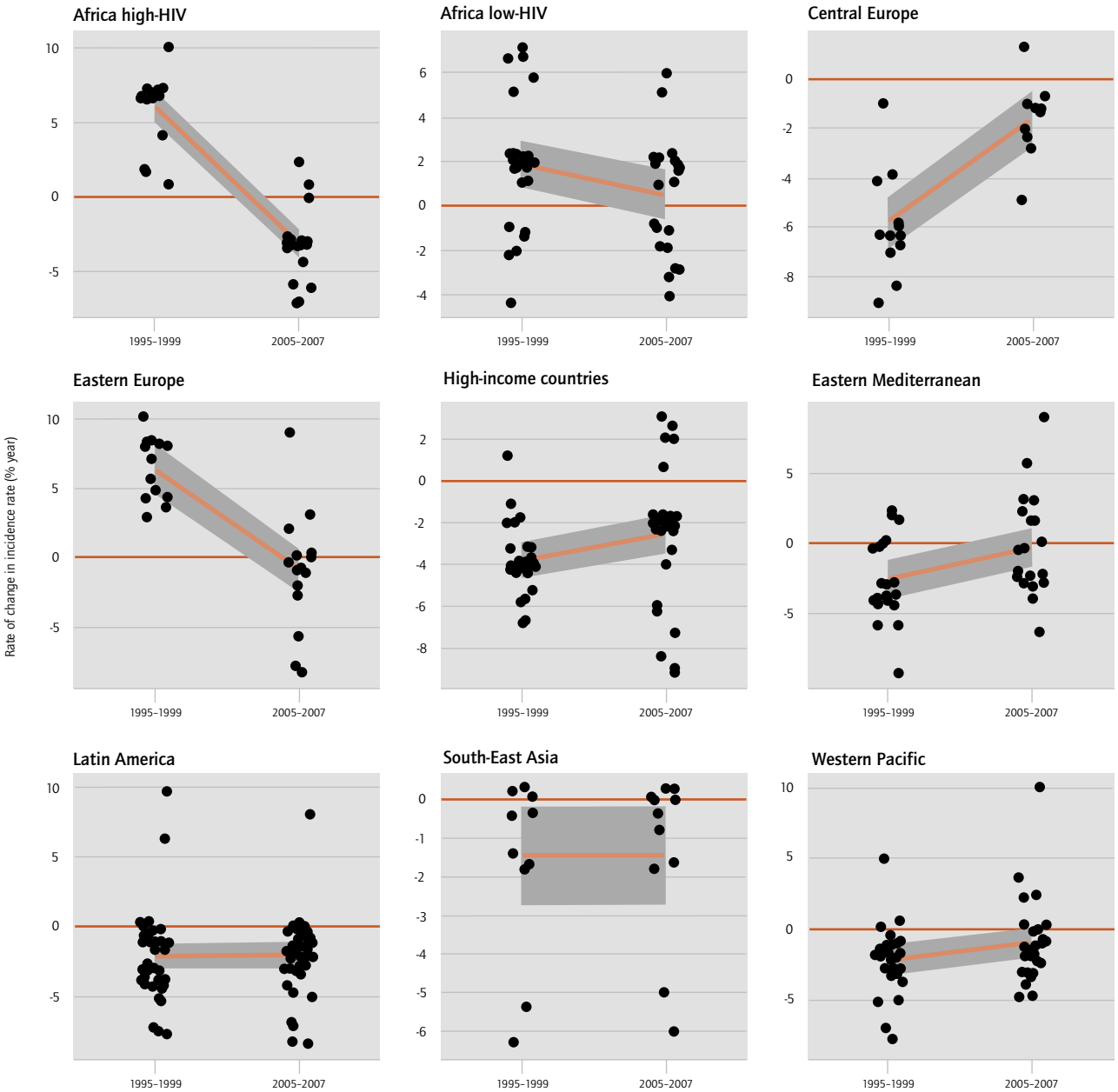


revisions to estimates of mortality rates before 2007 (BOX 1.1). From trends in TB incidence combined with assumptions about case fatality rates among different categories of case (ANNEX 2), the global TB mortality rate (including TB deaths in HIV-positive people) is estimated to have increased during the 1990s; this trend was reversed around the year 2000, and mortality rates are now in decline (FIGURE 1.8).

Regional trends in TB mortality rates from 1990 to 2007 as well as projections up to 2015 (based on extrapolation of the trend in 2005–2007) are shown in FIGURE 1.12. Mortality rates have been declining in the Eastern Mediterranean Region, the Region of the Americas, the South-East Asia Region and the Western Pacific Region since 1990. The decline has been relatively steady in the Region of the Americas and the Western Pacific Region, while the decline was faster in the Eastern Mediterranean and South-East Asia regions after 2000. Of these four regions, three are on track to at least halve mortality rates by 2015. In the Western Pacific Region, the mortality target will be narrowly missed unless the current rate of decline accelerates from 2008. In the African and European regions, mortality rates increased substantially during the 1990s. Although this trend has been reversed (around 2000 in the European Region and around 2005 in the African region), mortality rates in 2007 were still far above the 1990 level in the African Region and just back to the 1990 level in the European Region. Projections indicate that neither region will reduce mortality rates back to even 1990 levels by 2015, and will certainly not halve mortality rates compared with 1990. The gulf between the 2015 targets and current mortality rates in these two regions mean that the world as a whole is unlikely to meet the Stop TB Partnership target of halving the mortality rate by 2015.

FIGURE 1.10

Changes in annual rates of incidence during 1995–1999 and 2005–2007, nine epidemiological subregions. Data points were randomly jittered horizontally to avoid over-plotting. The horizontal red line indicates no change in incidence. Data points above the red line indicate that incidence increased; the further from the line, the faster the increase. In subregion Africa high-HIV, incidence increased during 1995–1999 and decreased during 2005–2007. In central Europe, the rate of decline decreased between 1995–1999 and 2005–2007. A linear model was fitted to the data and fitted lines with uncertainty bounds were added to provide a visual aid.



1.2.4 Summary of progress towards MDG and Stop TB Partnership impact targets

The three major indicators of impact – incidence, prevalence and mortality rates per 100 000 population – are falling globally. If verified by further monitoring, MDG target 6.c was met globally by 2005 (incidence rates peaked in 2004), and in five of six WHO regions (the exception being the European Region, where rates are approximately stable).

The targets to halve prevalence and death rates by 2015 compared with 1990, set by the Stop TB Partnership, are more demanding. If the average rates of change in 2005–2007 persist, prevalence and death rates will fall quickly enough to meet the 2015 targets in the Region of the Americas and in the Eastern Mediterranean and South-East Asia regions. The Western Pacific Region will reach the target of halving the prevalence rate, but the mortality target may be narrowly missed unless the current rate of decline accelerates. Neither the prevalence nor the mortality targets will be met in the African and European regions. The gap between prevalence and mortality rates in 2007 and the targets in these two regions suggest that 1990 prevalence and death rates will not be halved by 2015 for the world as a whole.

FIGURE 1.11

Progress towards achieving the target of halving prevalence by 2015 compared with the level of 1990, by WHO region. The y-axis displays standardized prevalence rates, with the baseline set at the 1990 level in each region (black horizontal line) and regional targets set at 50% of the 1990 level (red horizontal line). Trends for 2008–2015 are forecast using an exponential regression of estimated prevalence rates over the period 2005–2007.

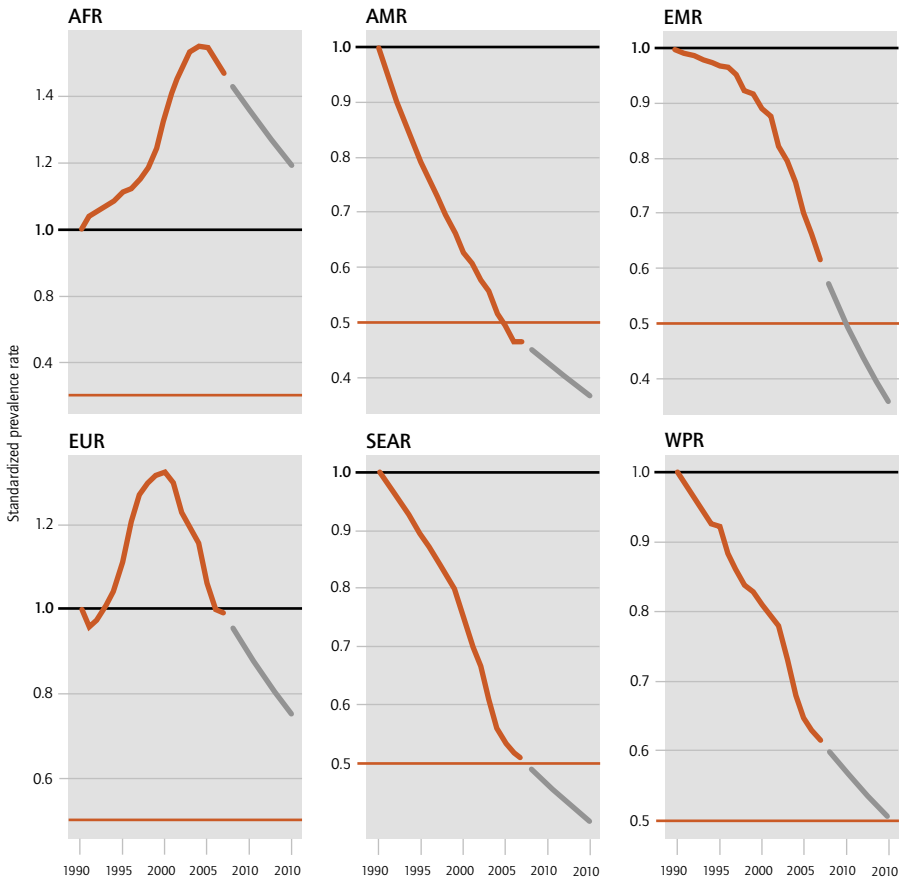
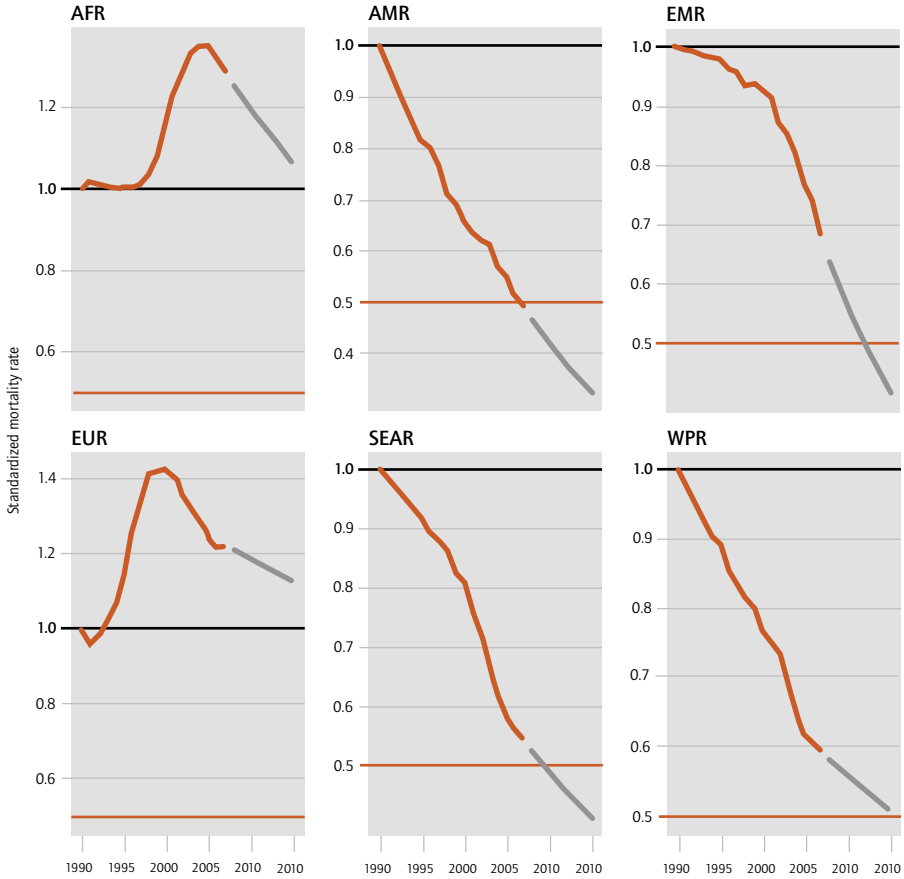


FIGURE 1.12

Progress towards achieving the target of halving mortality from TB by 2015 compared with the level of 1990, by WHO region. The y-axis displays standardized mortality rates, with the baseline set at the 1990 level in each region (black horizontal line) and regional targets set at 50% of the 1990 level (red horizontal line). Trends for 2008–2015 are forecast using an exponential regression of estimated mortality rates over the period 2005–2007. Mortality rates represented in these graphs are excluding deaths from TB in HIV-positive people.



1.3 Improving measurement of progress towards the 2015 impact targets: the WHO Global Task Force on TB Impact Measurement

As explained in SECTION 1.1, the impact targets for reducing rates of TB incidence, prevalence and mortality are the focus of international and national efforts to control TB. Demonstrating whether or not they are achieved is of major importance for individual countries, the United Nations, WHO and the Stop TB Partnership, and a variety of technical, financial and development agencies. The estimates of TB incidence, prevalence and mortality and their trends presented in SECTION 1.2 are based on the best available data and analytical methods, both of which were reviewed and endorsed by a group of experts in mid-2008.[1] Nonetheless, with better surveillance systems, additional survey data, more in-depth analysis of existing surveillance and programmatic data and further refinement of analytical methods, these estimates could be improved in the period up to 2015 (and beyond).

With the exception of Eritrea in 2005, the last nationwide and population-based surveys of the prevalence of TB disease in the African Region were undertaken between 1957 and 1961; in many countries, such surveys have never been done (ANNEX 4). Notification systems are estimated to capture only around 50–70% of incident cases in most countries (SECTION 1.5), and within these systems reporting can be incomplete (CHAPTER 2, SECTION 2.2.7). Only 10% of the estimated 1.5 million TB-attributable deaths (in HIV-negative people) in 2005 were recorded in vital registration systems and reported to WHO by August 2008.[2] The figures for the South-East Asia and Western Pacific regions, which account for 55% of the world's TB cases, were <0.1% and 2.6% respectively. These observations show how much progress is needed to achieve the ultimate goal of measuring TB incidence and mortality directly from surveillance data (that is, that ultimately all TB cases are included in case notification data and that vital registration systems account for all (or almost all) TB deaths).

In this context, WHO established a Global Task Force on TB Impact Measurement (hereafter the Task Force) in June 2006. The Task Force includes experts in TB epidemiology, representatives from major technical and financial agencies, and representatives from countries with a high burden of TB. Its mandate is to produce a robust, rigorous and widely-endorsed assessment of whether the 2015 targets for reductions in TB incidence, prevalence and mortality are achieved at global level, for each WHO region and in individual countries; to regularly report on progress towards these targets in the years leading up to 2015; and to strengthen national capacity in monitoring and evaluation of TB control. Better data and better analysis of these data can be used to identify where and why cases are not being detected, and form the basis for implementing appropriate components of the Stop TB Strategy (CHAPTER 2).

Following three Task Force meetings (June 2006, December 2007 and September 2008) and two years of work by the secretariat in WHO, clear policies and recommendations for how to measure incidence, prevalence and mortality from 2008 onwards, with a focus on the 2015 impact targets, have been agreed upon. These are explained in full in a forthcoming WHO policy paper,[3] with the key elements summarized in the form of a policy package (TABLE 1.3).

TABLE 1.3
WHO policy package for measuring rates of TB incidence, prevalence and mortality, 2008–2015 and beyond

General

1. Improve surveillance systems to include all (or almost all) incident cases in TB case notification data and to account for all (or almost all) TB deaths in vital registration systems.
2. Strengthen national capacity to monitor and evaluate the TB epidemic and to measure progress in TB control.
3. Review and update periodically the data, assumptions and analytical methods used to produce WHO estimates of TB incidence, prevalence and mortality rates.
4. Report by Task Force on whether 2015 MDG and Stop TB Partnership targets are achieved (or not), shortly after 2015.

Measuring TB incidence rates

5. Analyse periodically the reliability and coverage of case notification data using a standard framework, in order to estimate the total number of incident TB cases and trends in incidence rates.
6. Certify and/or validate TB notification data for countries where analyses using the standard framework show that TB notification data are a close proxy (direct measure) of TB incidence.
7. Cross-validate estimates of TB incidence using TB mortality data from vital registration systems.

Measuring TB prevalence rates

8. Survey the prevalence of TB disease in 21 global focus countries according to WHO guidelines and Task Force recommendations.
9. Produce indirect estimates of TB prevalence based on estimates of TB incidence and the duration of TB disease for countries where surveys of the prevalence of TB disease are not implemented.

Measuring TB mortality rates

10. Develop national vital registration systems to reliably record all TB deaths.
11. Initiate sample vital registration where national vital registration systems are not yet available.
12. Produce indirect estimates of TB mortality using estimates of TB incidence and case fatality rates for countries without reliable national or sample vital registration systems.

Evaluating the impact of TB control

13. Conduct studies periodically to evaluate the impact of control on rates of TB incidence, prevalence and mortality.

1.3.1 Measurement of incidence

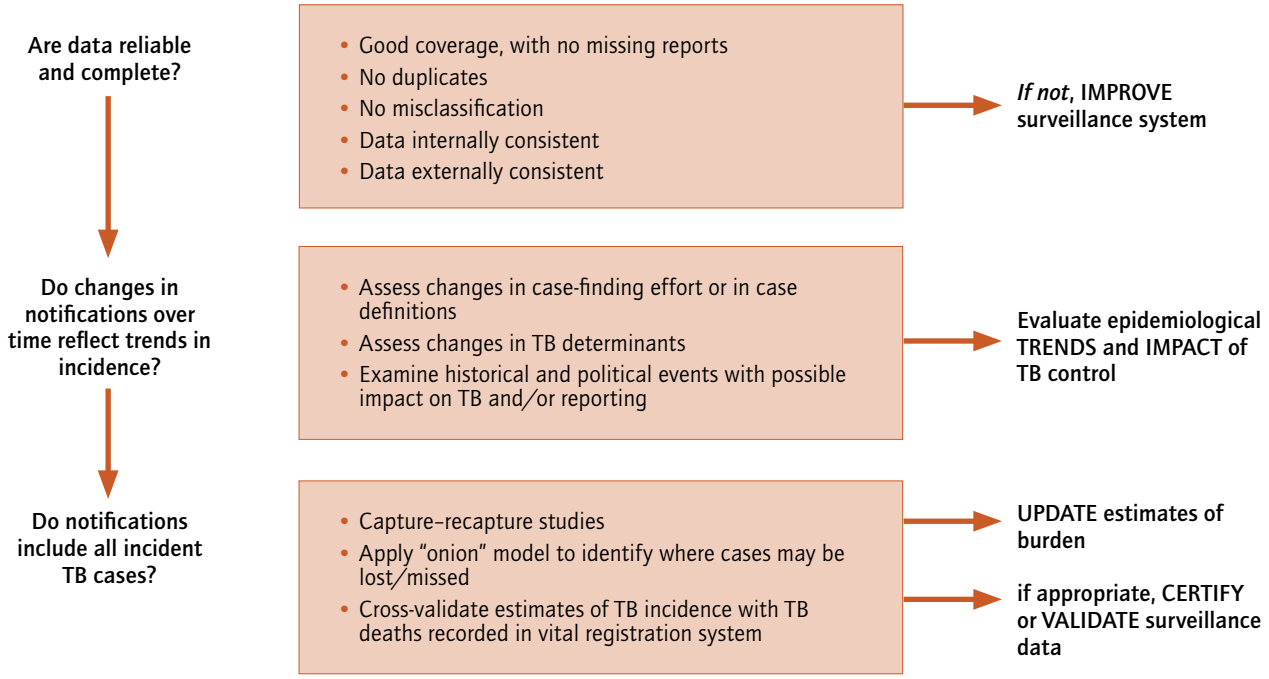
For improved measurement of incidence (its absolute value and trend), the policy package focuses on a systematic approach

[1] These experts were members of the WHO Global Task Force on TB Impact Measurement and external experts in epidemiology and statistics. The review also formed part of the TB component of the forthcoming update to the Global Burden of Disease, due for publication in 2010.

[2] Korenromp EL et al. State of the Art Review. The measurement and estimation of tuberculosis mortality. *International Journal of Tuberculosis and Lung Disease*, 2009 (in press).

[3] *Measuring progress in TB control: WHO policy and recommendations* [policy paper]. Geneva, World Health Organization, 2009 (in press). The policy paper is based on (i) a comprehensive review of methods to measure incidence, prevalence and mortality (Dye C et al. Measuring tuberculosis burden, trends and the impact of control programmes. *Lancet Infectious Diseases*; published online 16 January 2008 (available at http://infection.thelancet.com) and (ii) background papers prepared for Task Force meetings and associated discussions. The policy paper was endorsed by the Task Force during its meeting in September 2008. It was also reviewed by WHO's Strategic and Technical Advisory Group on TB (STAG-TB) in June 2008.

FIGURE 1.13
Framework for estimation and measurement of TB incidence using surveillance data



to assessing the quality and coverage of TB notification data. This approach consists of three core components (FIGURE 1.13). The first is an assessment of the quality of available TB notification data; this includes checking the completeness of reporting (with a benchmark that 100% of reporting units should report data each quarter) and assessing whether there are duplicate or misclassified records. It also includes analysis of the internal and external consistency of data using national and subnational data. Internal consistency means that data are consistent over time and space (or, if not, that variation can be explained), while external consistency means that data are consistent with existing evidence about the epidemiology of TB (for example, the proportion of pulmonary cases that are smear-positive, and the ratio of male to female cases). The results of the analysis of completeness, duplications, misclassifications and internal or external consistency can be used as the basis for identifying where and how surveillance needs to be strengthened.

The second component of the framework concerns analysis of trends in notification data, with the aim of assessing the extent to which they reflect trends in rates of TB incidence and the extent to which they reflect changes in other factors (such as programmatic efforts to find and treat more cases). Distinguishing between changes that are due to incidence and changes that are due to other factors is crucial when using notification data to estimate trends in the rates of TB incidence and case detection. The analysis in the second component of the framework should be used to determine whether time series of TB notifications are a good proxy for trends in TB incidence, or the extent to which they need to be adjusted for other factors before using them as a measure of trends in TB incidence. If TB notifications are a good proxy for trends in TB incidence, they can be used reliably to assess whether incidence is falling (MDG Target 6.c) or not.

Even when available notification data are complete and of high quality, and when they appear to be a good proxy of trends in TB incidence, they are not sufficient to estimate TB incidence in absolute terms. To do this, analysis of whether all TB cases are being captured in official notification systems is required (as was done for most countries when the first estimates of the global burden of TB were produced in 1997; see ANNEX 2). The major reasons why cases are missed from official notification data have been defined in the so-called "onion" model,[1] and include laboratory errors, lack of notification of cases by public and private providers, failure of cases accessing health services to be identified as TB suspects and lack of access to health services. Operational research (such as capture–recapture studies) as well as supporting evidence (such as the knowledge and practices of health-care staff related to definition of TB suspects, the extent to which regulations about notification of cases are observed and population access to health services) can be used to estimate the fraction of cases that are missing from official notification data. It is also possible to assess the coverage of notification data, and to cross-validate estimates of TB incidence produced using other methods, by analysing the number of TB deaths recorded in vital registration systems.

The objective is that the results from using this framework are used in one of two ways. If a country's TB surveillance data are shown to be a close proxy for TB incidence, the data will be "certified" or "validated" as a direct measure of TB inci-

[1] As referred to in FIGURE 1.13. For a full explanation, see *Measuring progress in TB control: WHO policy and recommendations* [policy paper]. Geneva, World Health Organization, 2009 (in press).

BOX 1.2

Estimating TB incidence following in-depth analysis of surveillance and programmatic data during the period 1996–2006: an example from Kenya

The incidence of TB in Kenya was indirectly estimated from TB notification data in 1997, as part of a global effort to estimate the global epidemiological burden of TB. The estimate was based on an expert assessment that the percentage of incident smear-positive cases being notified was 57% (i.e. 57% case detection rate). Until 2006, the trend in TB incidence before and after 1997 was assumed to be the same as the trend in TB notifications (of all forms of TB case).

Kenya has experienced a generalized HIV epidemic since the early 1980s and substantial efforts to improve the quality and coverage of TB diagnosis and treatment services were made from 2001 onwards. This made it difficult to disentangle the effect of HIV (which affects TB incidence) from the effect of programme performance on TB notifications, which in turn made it difficult to estimate the trend in TB incidence. Between September 2006 and December 2007, estimates of the absolute value of TB incidence and the trend in TB incidence were jointly reviewed by WHO and the NTP. This was done in the context of new evidence and new analysis. The major new sources of evidence were (i) data on trends in HIV-positive and HIV-negative TB notifications separately (ii) a direct measure of the prevalence of HIV among TB patients (iii) a recent survey of the prevalence of HIV in the general population and (iv) evidence about how programme performance had changed during the period 1996–2006. Both (i) and (ii) became available following the introduction and rapid expansion of provider-initiated HIV testing for TB patients in 2005. Evidence about programme performance during the period 1996–2006 was compiled during 2007. The four principal indicators used were: the number of health units where TB diagnosis was available, the number of health units where TB treatment was available, the number of NTP staff at national, provincial and district level, and NTP funding. For all four of these indicators, there was a clear relationship with trends in TB notifications from 2001 to 2006, while HIV-related data suggested that the HIV epidemic peaked around 2000 and had not caused any increase in TB incidence from 2001 to 2006. In combination, these new data provided strong evidence that the increase in TB notifications after 2001 was due to programmatic improvements (and not increases in TB incidence). This led to a downward revision in the estimate of TB incidence in 2006, an adjustment of the estimated trend in TB incidence, and an upward revision in the estimated case detection rate (to 70%). The original estimate of TB incidence (and case detection) in 1997 was left unchanged.

To allow reliable measurement of trends in TB incidence from 2007 onwards, maintaining high rates of HIV testing for TB patients is essential. This will allow trends in HIV-positive and HIV-negative TB notifications to be separated. Trends in HIV-negative TB notifications can be used to measure changes in case-finding. Comparison of trends in HIV-positive and HIV-negative TB notifications can be used to assess the impact of HIV on TB incidence. Efforts to strengthen routine surveillance, including the introduction of new recording and reporting forms and expanded use of electronic recording and reporting systems, have begun.

For further details, see Mansoer J et al. New methods for estimating the tuberculosis case detection rate. *Bulletin of the World Health Organization*, 2009 (in press).

BOX 1.3

Estimating TB incidence using capture-recapture methods: an example from Egypt

The NTP in Egypt compiled evidence that most TB cases have access to health-care services provided by public or private facilities as part of a multi-country operational research project in the Eastern Mediterranean. The number of TB cases experiencing symptoms and seeking care but not being diagnosed is therefore expected to be low. Nonetheless, when patients are diagnosed and treated by providers that are not linked to the NTP, it is unlikely that they are recorded in official notification data. Quantifying the proportion of cases that are diagnosed by non-NTP providers (the extent to which there is under-notification) may therefore allow a more accurate estimate of the total number of cases in the country as well as the proportion that are being detected by the NTP (the case detection rate).

To assess the extent to which cases were being missed in official notification data and in turn to update estimates of TB incidence and the case detection rate, the Ministry of Health in Egypt together with the WHO Office for the Eastern Mediterranean implemented a capture–recapture study in 2008. Study registers for listing TB cases were introduced in a nationally representative sample of non-NTP health facilities in the private and public sectors. The list of cases in these registers was then compared with the list of notified cases for the same period. Using capture–recapture log-linear models, the number of cases missed by all sources was estimated by comparing (i) the number of cases observed in each source of data independently with (ii) the number of common cases among all sources (that is, the overlap in cases). Analyses were undertaken for the whole sample and for sputum smear-positive cases only.

Revised estimates of TB incidence in Egypt based on capture–recapture analysis

	NOTIFICATION DATA (2007)		WHO ORIGINAL ESTIMATES (2007)		WHO REVISED ESTIMATES (2007)	
	ALL CASES	SS+ CASES	ALL CASES	SS+ CASES	ALL CASES	SS+ CASES
New TB cases	9 459	4 887	17 517	7 882	15 873	6 765
Rates (per 100 000 population/year)	13	6.5	24	10.5	21	9
Case detection rate (%)	–	–	54	62	60	72

For capture–recapture estimates to be valid, certain conditions must be met. In particular, three or more sources of data should be available to allow adjustment for dependencies among the sources of data. This was the case in Egypt: the three available sources were the NTP registry, the study registers of private non-NTP providers and the study registers of public non-NTP providers.

Based on the study results, the case detection rate for smear-positive cases was revised upwards to 72% (from 62%). The case detection rate for all cases was revised upwards to 60% (from 54%). Similar studies in other countries where all (or almost all) cases have access to health services could also help to revise existing TB estimates.

dence. If a country's surveillance data are found to include only a fraction of cases, this fraction will be estimated and used to update estimates of incidence (and by extension the case detection rate). Findings will also be used to identify the measures needed to strengthen surveillance so that the standards required for data to be certified or validated can be met. Recent examples of how different components of the framework can be implemented in practice are provided in BOX 1.2, BOX 1.3 and BOX 1.4.

1.3.2 Measurement of prevalence

There are two methods for estimating the prevalence of TB. The first is direct measurement using a cross-sectional population-based survey. Such surveys are only feasible if the estimated prevalence of smear-positive TB is around 100 per 100 000 population or more (otherwise the sample size required to measure prevalence with sufficient precision is so large that a survey is impractical in terms of cost and logistics). Even with the global average of around 100 cases per 100 000 population, a sample size of around 200 000 and a budget of US$ 1–2 million is usually required. Since prevalence typically falls more quickly than TB incidence in response to control efforts, a series of surveys conducted at relatively wide intervals (for example, 10 years) can be very useful for capturing large changes in the epidemiological burden of TB in high-burden or high-incidence countries (recent examples from HBCs include China, where surveys were implemented in 1990 and 2000, with a third planned for 2010; and the Philippines, where surveys were implemented in 1997 and 2007, with a third planned for 2017). In countries where the burden of TB is lower, prevalence can also be estimated indirectly as TB incidence multiplied by the average duration of disease (ANNEX 2).

Although the ultimate goal for all countries is to measure progress in TB control using routinely-collected surveillance data, the Task Force has identified 21 countries where nationwide population-based surveys of the prevalence of TB disease during the period 2008–2015 are a priority for the

BOX 1.4

Estimating TB incidence using mortality data from a vital registration system: an example from Brazil

WHO estimates of TB incidence are based on notification data, surveys of the annual risk of infection, surveys of the prevalence of TB disease combined with estimates of the average duration of disease, and mortality data from vital registration systems combined with estimates of the case fatality rate. Where several sources of evidence exist, greatest weight is attached to the most reliable data. For most countries, incidence is indirectly estimated from TB case notification data and an expert assessment of the percentage of incident TB cases being notified. When case-finding efforts do not change much over time, trends in TB incidence are often assumed to mirror trends in TB case notification rates (ANNEX 2). Until 2005, these methods were used to estimate TB incidence and its trend in Brazil.

By 2005, the Ministry of Health of Brazil had greatly improved the TB notification system and the death registration component of the vital registration system. This included extending coverage of both systems throughout the country, validating data and systematically linking records within and between the two databases. Linkage of records within the TB notification database and implementation of procedures to distinguish between new and re-treatment or transfer-in records were used to identify duplicate records. This showed that notifications had been artificially inflated and that the cure rate had been underestimated (see table below). Removal of duplicate records increased the gap between the number of new TB cases notified and the number of new TB cases estimated by WHO, highlighting the need for a review of existing estimates.

The effect of removing duplicate records from the database of TB case notifications, 2005

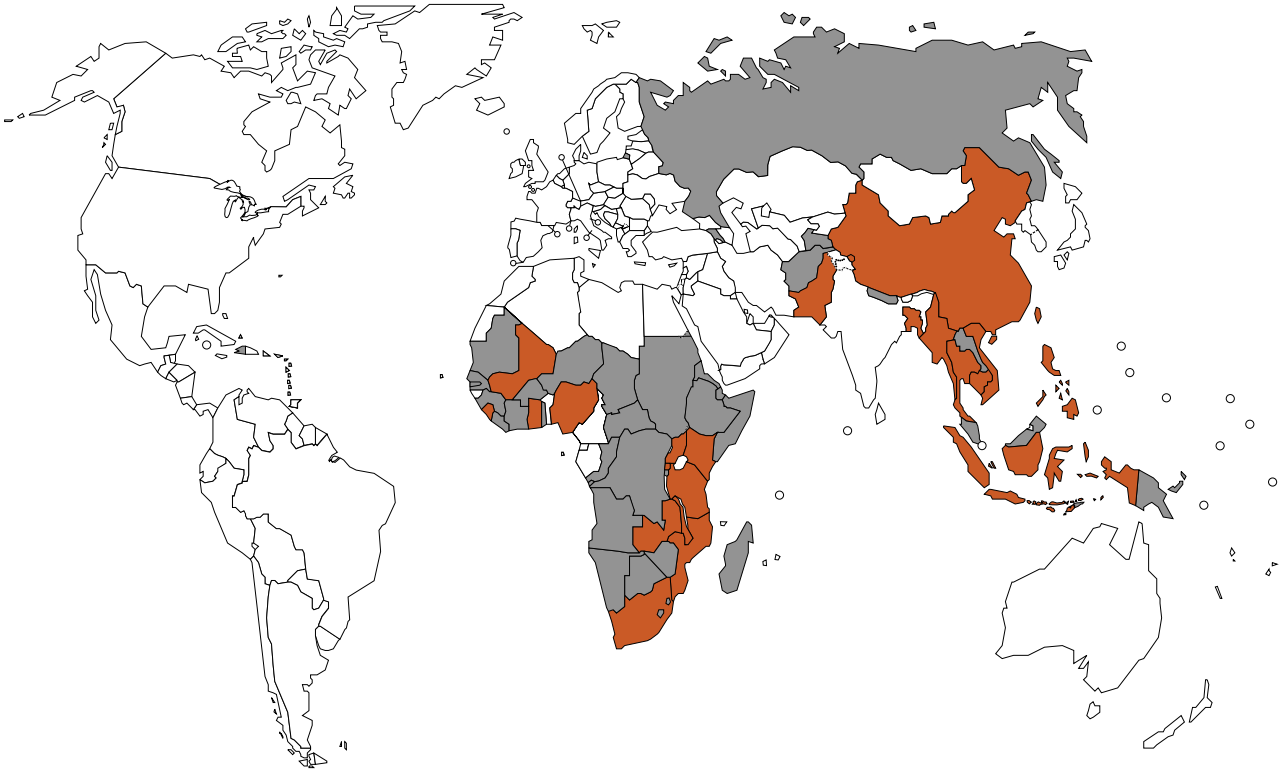
DUPLICATES REMOVED	NEW NOTIFIED CASES		NOTIFICATION RATE		CHANGE (%)	CURED (%)		CHANGE (%)
	BEFORE	AFTER	BEFORE	AFTER		BEFORE	AFTER	
19 064	81 330	74 113	44.2	40.2	-9.7	60.5	64.5	+6.7

Estimates of TB incidence in Brazil are now based on an analysis of TB deaths recorded in the vital registration system. The case fatality rate was calculated by cross-linking the case-based TB notification database and the mortality database. Incidence in 2005 was then estimated as the number of TB deaths in the mortality database divided by the case fatality rate (estimated as the number of deaths in the mortality database divided by the number of cases in the notification database, with appropriate adjustments for the proportion of records in both systems that could be linked and a minor adjustment for the coverage of TB mortality records). Since the mortality information system was judged by the local authorities to have higher coverage than the TB notification system, and since it is unlikely that the case fatality rate had changed markedly in recent years, the trend in incidence over time was estimated by assuming that the trend in the TB incidence rate was the same as the trend in the TB mortality rate from 2001 to 2005. This suggested that incidence was falling at a rate of 3.3% per year. Incidence in absolute terms for years before 2005 was also based on this trend (see table below).

Original and revised WHO estimates of TB incidence using TB mortality data, 2005

	NOTIFICATIONS	ORIGINAL ESTIMATE OF INCIDENCE	REVISED ESTIMATE OF INCIDENCE
New TB cases	74 113	111 050	95 408
Incidence or notification rate (per 100 000 population/year)	40	60	51
Case detection rate	–	69%	78%

FIGURE 1.14
The 21 global focus countries where a national prevalence of TB disease survey is recommended in the period 2008–2015 (red), and extended list of countries meeting the criteria (grey)



purposes of global and regional measurements of progress in TB control (FIGURE 1.14). The list includes 12 African countries plus Pakistan and all but one of the nine HBCs in the South-East Asia and Western Pacific regions (the exception is India, where subnational surveys have already been implemented and further such surveys are planned). Countries were selected according to various criteria,[1] including their estimated prevalence of smear-positive TB, their share of the global and regional numbers of estimated TB cases, their case detection rate, HIV prevalence in the general population and the availability (or not) of data from an earlier survey. Existing plans and funding for surveys and the capacity of technical agencies to provide assistance were also considered. Most of these countries were already committed to the planning and implementation of surveys before their inclusion on the list developed by the Task Force. However, this inclusion means that particular efforts to support the successful design and implementation of surveys in these countries are being made by the Task Force and its partners. To date, these efforts have included workshops to support 10 countries (eight African countries plus Pakistan and Thailand) to develop survey protocols consistent with recent guidelines,[2] expert review of protocols, facilitating the provision of advice about Global Fund applications or reprogramming of existing grants, and country missions.

1.3.3 Measurement of mortality

The best way to measure the number of deaths from TB is via a national vital registration system in which deaths are coded according to the International Statistical Classification of Diseases (ICD-10), and data are of proven completeness and accuracy (see BOX 1.4 for an example from Brazil). To make this possible, many countries will need to develop a vital registration system, or substantially strengthen an existing system (see also ANNEX 4). In the meantime, sample vital registration combined with verbal autopsy may provide an interim solution. Where neither national nor sample vital registration systems exist, TB mortality can be estimated using estimates of TB incidence and the case fatality rate (ANNEX 2).

1.3.4 Status of impact measurement in HBCs at the end of 2008

The status at the end of 2008 of the three major components of impact measurement highlighted above – in-depth analysis of routine surveillance data; surveys of the prevalence of TB disease; and analysis of mortality records from vital registration data or surveys – is shown for the 22 HBCs in TABLE 1.4.[3] An in-depth analysis of surveillance data was reported to have been undertaken by 12 countries in the past five years, although the extent to which these analyses were in

[1] For a full explanation, see the *Report of the second meeting of the WHO Task Force on TB Impact Measurement. Geneva, 6–7 December 2007.* Geneva, World Health Organization, 2007 (unpublished).

[2] World Health Organization (17 authors). *Assessing tuberculosis prevalence through population-based surveys*. Manila, World Health Organization, 2007.

[3] Data for other countries were reported but require further validation by the Task Force secretariat.

TABLE 1.4
Measurement of incidence, prevalence and mortality carried out (2000–2007) and planned (2008–2015)

	IN-DEPTH ANALYSIS OF ROUTINE SURVEILLANCE DATA		PREVALENCE OF DISEASE SURVEY[a]		ANALYSIS OF VITAL REGISTRATION DATA (MORTALITY RECORDS)	
	CARRIED OUT	PLANNED	CARRIED OUT	PLANNED	CARRIED OUT	PLANNED
1 India	Y	Y	Y, subnational	Y, subnational	N	N
2 China	Y	Y	Y	Y	N	N
3 Indonesia	Y	Y	Y	Y	Y	Y
4 Nigeria	Y	Y	–	Y	N	N
5 South Africa	–	Y	–	Y	Y	Y
6 Bangladesh	N	N	Y	–	N	N
7 Ethiopia	N	N	–	Y	N	N
8 Pakistan	N	N	–	Y	–	–
9 Philippines	N	N	Y	–	N	N
10 DR Congo	Y	Y	N	N	N	N
11 Russian Federation	Y	Y	Y	Y	Y	Y
12 Viet Nam	–	–	Y	–	–	–
13 Kenya	Y	Y	N	Y	N	N
14 Brazil	–	Y	N	N	Y	Y
15 UR Tanzania	Y	Y	–	Y	N	N
16 Uganda	–	–	–	Y	N	N
17 Zimbabwe	Y	Y	N	N	N	Y
18 Thailand	Y	Y	Y, subnational	Y	N	N
19 Mozambique	Y	Y	N	N	N	N
20 Myanmar	Y	Y	Y, subnational	Y	N	N
21 Cambodia	N	N	Y	Y	N	N
22 Afghanistan	N	N	N	N	N	N
High-burden countries[b]	**12**	**14**	**10**	**14**	**4**	**5**

– Indicates information not provided.
[a] National survey unless otherwise specified.
[b] The last row of the table shows the number of countries answering "yes" to each question.

line with the framework developed by the Task Force in 2008 (FIGURE 1.13) is not known. Such analyses are planned by a further 14 countries, offering an excellent opportunity to apply (and test) this framework in practice.

Surveys of the prevalence of TB disease have been undertaken in all of the five HBCs in the South-East Asia Region (two nationwide surveys and three subnational surveys) and in all four HBCs in the Western Pacific Region (all of which were nationwide surveys) between 2000 and 2007. With further surveys already planned in seven of these nine HBCs,[1] all of which are among the 21 global focus countries selected by the Task Force, the South-East Asia and Western Pacific regions are particularly well placed to measure impact between 2000 and 2015. China is best placed to measure whether or not the Stop TB Partnership target of halving prevalence between 1990 and 2015 is achieved, since it has already conducted surveys in 1990 and 2000, with a third survey planned for 2010. Besides the nine HBCs in the South-East Asia and Western Pacific regions, no other HBCs have conducted a survey of the prevalence of TB disease since 2000. Nonetheless, six of the African HBCs as well as Pakistan are planning to implement surveys between 2008 and 2010. This includes Ethiopia; while not on the original list of 21 countries, a survey in this country would considerably increase the share of the population and estimated TB cases surveyed in the African Region. Among the remaining countries shown in FIGURE 1.14 (Ghana, Malawi, Mozambique, Rwanda, Sierra Leone and Zambia), all except Mozambique and Sierra Leone have plans to implement surveys starting in 2009 or 2010. If these planned surveys are to be successfully implemented, there are several major challenges that need to be overcome. These include closing funding gaps[2] and delays in procuring X-ray equipment.

As already highlighted above, few HBCs have analysed TB mortality using data from vital registration systems or mortality surveys. The countries where mortality data from vital registration systems have been used to quantify TB deaths are Brazil, the Russian Federation and South Africa, while Indonesia has conducted a mortality survey. This clearly demonstrates the need for general strengthening of national information and general health information systems in many countries.

[1] This includes a survey planned in the Philippines in 2017. The exceptions where future surveys are not yet planned are Bangladesh and Viet Nam, where implementation of nationwide surveys was only recently completed.

[2] Most countries have included surveys in Global Fund proposals. However, development of study protocols has shown that the funding requested is often too low. Reprogramming of existing grants or application for supplementary funding is required. A few countries have not yet secured funding and plan to apply to the Global Fund in round 9. The deadline for round 9 applications is July 2009.

1.4 Case notifications

1.4.1 Total case notifications

The 196 countries reporting to WHO in 2008 notified 5.6 million new and relapse cases in 2007, of which 2.6 million (46%) were new smear-positive cases (TABLE 1.5; FIGURE 1.15). Of these notifications, 5.5 million (99%) were from DOTS programmes, including 2.6 million (47%) new smear-positive cases (also 99% of total notifications of smear-positive cases). The African Region (22%), South-East Asia Region (36%) and Western Pacific Region (25%) together accounted for 83% of all notified new and relapse cases and for similar proportions of new smear-positive cases in 2007. Among new pulmonary cases reported by DOTS programmes (TABLE 1.5), 57% were new smear-positive (a minimum of 65% expected).

A total of 37.3 million new and relapse cases, and 18.1 million new smear-positive cases, were notified by DOTS programmes in the 13 years between 1995 (when reliable recording began) and 2007.

1.4.2 Case notifications disaggregated by sex

Notifications disaggregated by sex were reported for new pulmonary smear-positive TB cases from DOTS programmes by 170 countries. Of 2.55 million notifications (99.2% of total notifications in DOTS areas and 98.3% of all notifications), 1.65 million were male and 0.9 million were female, giving a male:female ratio of 1:8.

The distribution of the male:female ratio across age groups in the nine epidemiological subregions is shown in FIGURE 1.16. For those aged ≥14 years, more men than women were detected with TB globally. The male:female ratio was consistently <1 in the 0–14 year-old age group, but increased in older age groups in most subregions. In the subregions of Central Europe, Eastern Europe, the Eastern Mediterranean and Latin America, the shape of the male:female ratio curve is concave. Reasons for this pattern and for differences compared with other regions are not well understood.

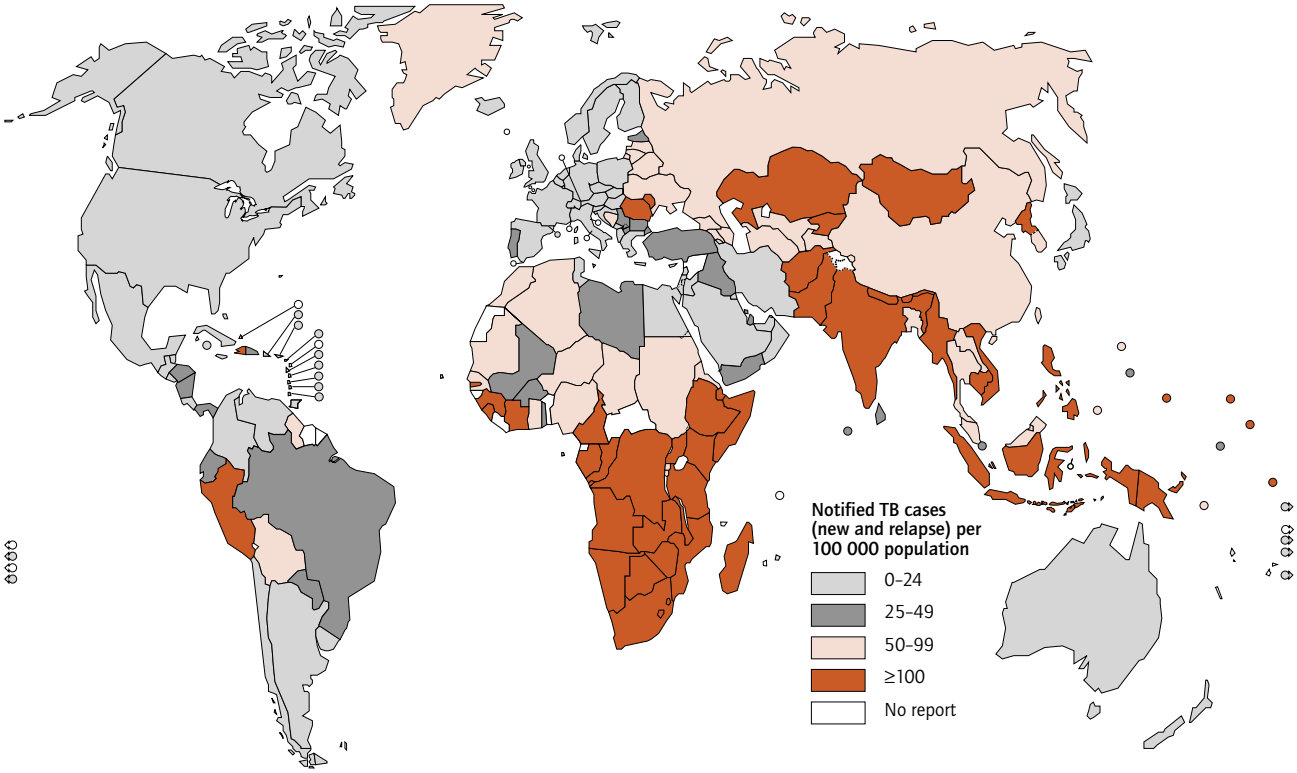
One of the factors associated with the male:female ratio in smear-positive TB patients is the prevalence of HIV in the general population. Relatively more women than men are

TABLE 1.5
Case notifications, 2007

	NEW AND RELAPSE CASES		NEW CASES						RE-TREATMENT CASES EXCLUDING RELAPSE		OTHER[a]		% OF NEW PULMONARY CASES SMEAR-POSITIVE[b]	
			SMEAR-POSITIVE		SMEAR-NEGATIVE/ UNKNOWN		EXTRA-PULMONARY							
	DOTS	WHOLE COUNTRY	DOTS	WHOLE COUNTRY	DOTS	WHOLE COUNTRY	DOTS	WHOLE COUNTRY	DOTS	WHOLE COUNTRY	DOTS	WHOLE COUNTRY	DOTS	WHOLE COUNTRY
1 India	1 295 943	–	592 587	–	398 862	–	206 840	–	179 686	–	–	–	60	–
2 China	979 502	–	465 877	–	430 634	–	36 612	–	66 437	–	–	–	52	–
3 Indonesia	275 193	–	160 617	–	102 613	–	8 048	–	467	–	–	–	61	–
4 Nigeria	82 417	–	44 016	–	32 088	–	4 044	–	3 824	–	–	–	58	–
5 South Africa	315 315	–	135 604	–	105 631	–	45 738	–	38 304	–	–	–	56	–
6 Bangladesh	147 342	–	104 296	–	23 152	–	16 106	–	–	–	–	–	82	–
7 Ethiopia	128 844	–	38 040	–	43 500	–	45 269	–	899	–	–	–	47	–
8 Pakistan	230 468	–	88 747	–	103 629	–	33 986	–	3 632	–	–	–	46	–
9 Philippines	140 588	–	86 566	–	49 422	–	1 513	–	1 988	–	–	–	64	–
10 DR Congo	99 810	–	66 099	–	10 968	–	18 737	–	2 406	–	548	–	86	–
11 Russian Federation	127 338	–	33 103	–	73 560	–	11 704	–	87 586	–	–	–	31	–
12 Viet Nam	97 400	–	54 457	–	17 554	–	18 675	–	944	–	–	–	76	–
13 Kenya	106 438	–	38 360	–	49 869	–	18 032	–	10 285	–	–	–	43	–
14 Brazil	66 759	74 757	34 211	38 444	20 566	23 065	9 318	10 318	5 224	5 704	–	–	62	63
15 UR Tanzania	59 371	–	24 520	–	20 521	–	12 526	–	2 721	–	–	–	54	–
16 Uganda	40 909	–	21 303	–	13 713	–	4 460	–	703	–	–	–	61	–
17 Zimbabwe	40 277	–	10 583	–	21 964	–	6 381	–	1 137	–	–	–	33	–
18 Thailand	54 793	–	28 487	–	17 156	–	7 485	–	–	–	–	–	62	–
19 Mozambique	37 651	–	18 214	–	13 064	–	5 020	–	393	–	–	–	58	–
20 Myanmar	129 081	–	42 588	–	41 826	–	40 002	–	4 466	–	–	–	50	–
21 Cambodia	35 601	–	19 421	–	7 120	–	8 412	–	894	–	–	–	73	–
22 Afghanistan	28 769	–	13 213	–	8 251	–	6 227	–	–	–	–	–	62	–
High-burden countries	**4 519 809**	**4 527 807**	**2 120 909**	**2 125 142**	**1 605 663**	**1 608 162**	**565 135**	**566 135**	**411 996**	**412 476**	**548**	**–**	**57**	**57**
AFR	1 251 642	1 251 735	561 091	561 149	408 936	408 964	223 320	223 322	74 165	–	792	–	58	58
AMR	208 419	218 426	114 307	119 838	52 053	55 041	31 389	32 564	10 462	11 045	688	704	69	69
EMR	375 857	378 895	155 558	155 572	135 441	136 865	75 299	76 898	4 338	–	131	–	53	53
EUR	322 132	350 529	97 156	105 288	154 365	165 777	45 094	53 623	121 936	127 354	57	416	39	39
SEA	2 007 111	2 007 193	972 390	972 441	622 776	622 795	295 857	295 866	194 733	194 736	218	220	61	61
WPR	1 325 173	1 365 284	656 883	666 412	529 296	548 024	78 479	88 538	73 005	77 144	951	4 438	55	55
Global	**5 490 334**	**5 572 062**	**2 557 385**	**2 580 700**	**1 902 867**	**1 937 466**	**749 438**	**770 811**	**478 639**	**488 782**	**2 837**	**6 701**	**57**	**57**

– Indicates zero or all cases notified under DOTS; no additional cases notified under non-DOTS.
[a] Cases not included elsewhere in table.
[b] Expected percentage of new pulmonary cases that are smear-positive is 65–80%.

■ **FIGURE 1.15**
Tuberculosis notification rates, by country, 2007



detected with TB in countries where the prevalence of HIV in the general population exceeds 1% (FIGURE 1.17).

The reasons for higher TB notification rates in men are poorly understood. Possible explanations include biological differences between men and women in certain age groups that affect the risk of being infected as well as the risk of infection progressing to active disease, and/or differences in the societal roles of men and women that influence their risk of exposure to TB and access to care (gender differences). The observation that TB notification rates tend to be more equal between men and women in countries with a high prevalence of HIV supports the hypothesis of biological differences (that can be lessened by immunological suppression due to HIV), but other non-biological factors may play an important role.

A total of 101 countries reported notifications of new cases of extrapulmonary TB disaggregated by age and sex (these countries accounted for 50% of total notifications of extrapulmonary TB). There were 195 002 male cases and 180 310 female cases, giving a male:female ratio of 1:1. The ratio among new extrapulmonary patients is much lower than the ratio for smear-positive TB patients (FIGURE 1.18); understanding the reasons for this difference and their programmatic implications requires further investigation and research.

In general, there is a need for gender-based analysis to investigate the range of biological, epidemiological, demographic, social and economic variables that affect gender differentials in the incidence and notification of TB.

1.5 Case detection rates

1.5.1 Case detection rate, all sources (DOTS and non-DOTS programmes)

The 2.6 million new smear-positive cases notified in 2007 from all sources (that is, from DOTS and non-DOTS programmes) represent 64% of the 4.1 million estimated cases (TABLE 1.2; TABLE 1.6). This is a small increase from a figure of 63% in 2006, following a slow increase from 35% to 43% between 1995 and 2001 and a more rapid increase from 43% to 60% between 2001 and 2005 (FIGURE 1.19). The improvement that occurred between 2001 and 2007 was attributable mostly to increases in the numbers of new smear-positive cases reported in the Eastern Mediterranean, South-East Asia and Western Pacific regions (TABLE 1.6).

The case detection rate of smear-positive cases in 2007 (for DOTS and non-DOTS programmes) was ≥70% in the Western Pacific Region (78%) and the Region of the Americas (76%), followed by the South-East Asia Region (69%). The African Region had the lowest case detection rate (47%) (TABLE 1.6; FIGURE 1.20). The Region of the Americas and the European Region reported the largest numbers of new smear-positive cases from outside DOTS programmes (FIGURE 1.20).

The 5.3 million new TB cases (all forms) that were notified in 2007 represent 57% of the 9.3 million estimated new cases. The case detection rate for all new cases was highest in the European Region (75%), followed by the Region of the Americas (71%) and the Western Pacific Region (68%) (FIGURE 1.20).

FIGURE 1.16
Sex ratio (M/F) by age group in nine epidemiological subregions, 2007

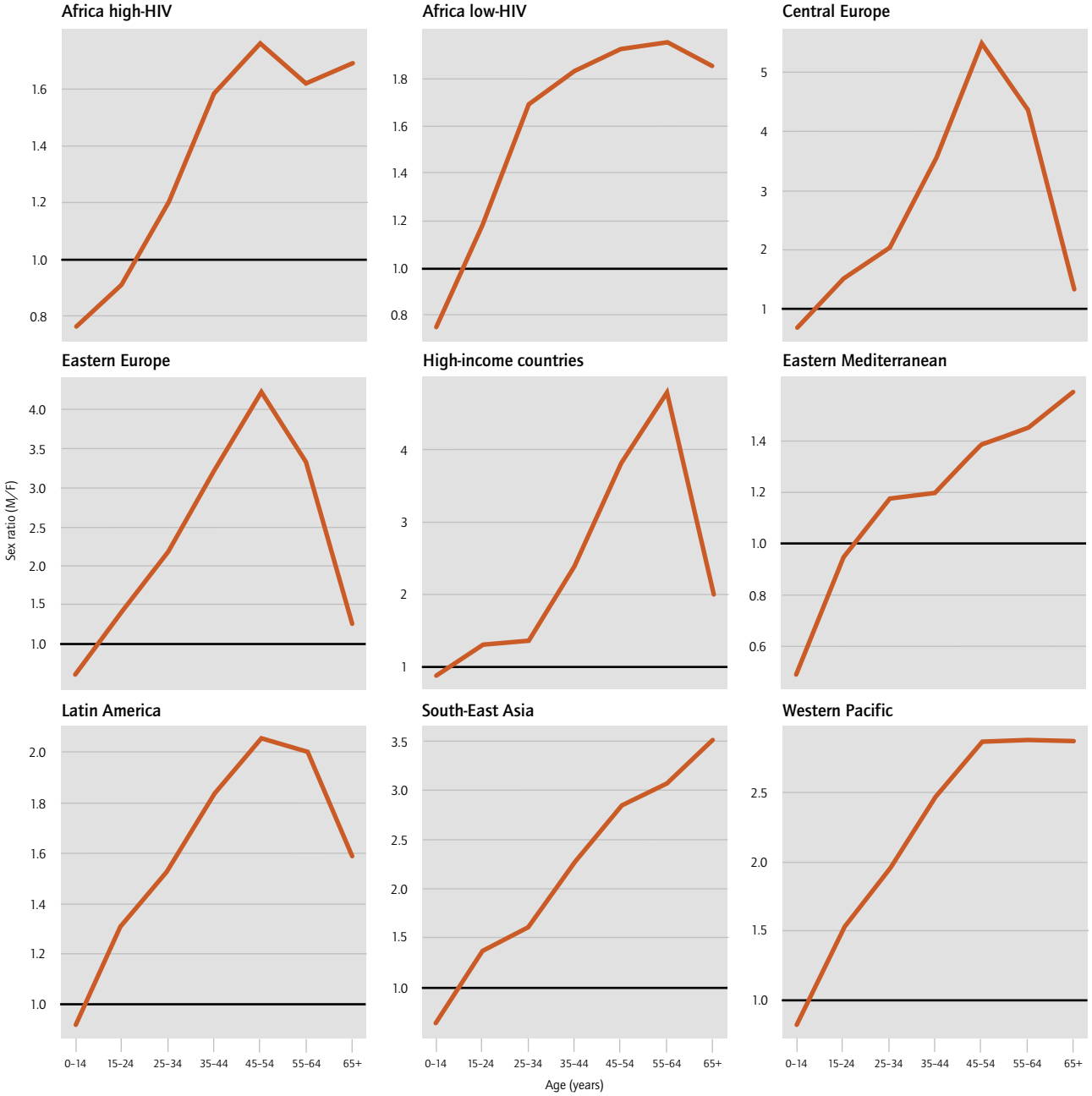


FIGURE 1.17

Distribution of sex ratios (M/F) in notified new smear-positive TB cases, by HIV epidemic level in the general population. The error bars denote 95% confidence intervals of the mean sex ratio within each HIV epidemic level. Horizontal random jitter was applied to data points to reduce over-plotting.

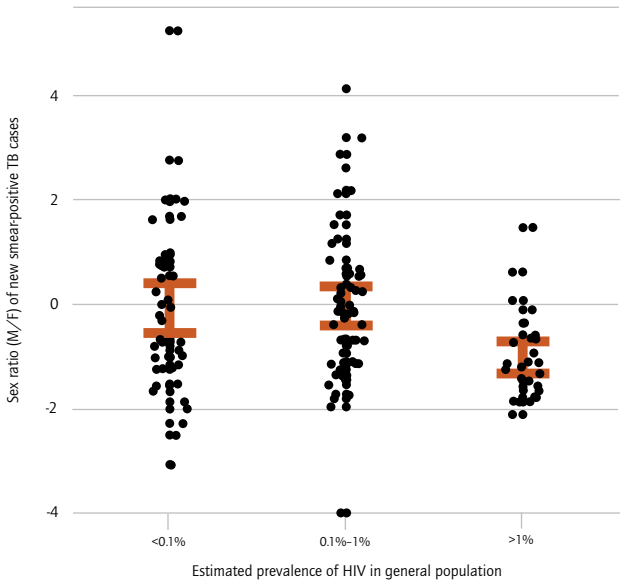


FIGURE 1.18

Distribution density of sex ratios (M/F) in new smear-positive TB cases (red) and in new extrapulmonary TB cases (grey). The vertical lines denote the mean sex ratio.

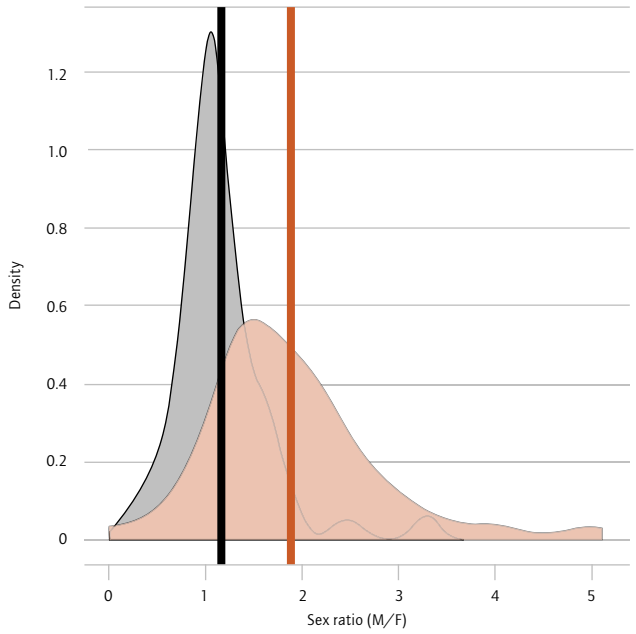


TABLE 1.6

Case detection rate for new smear-positive cases (%), 1995–2007[a]

	DOTS PROGRAMMES													WHOLE COUNTRY												
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
1 India	0.3	0.9	1.0	1.7	6.9	12	23	30	44	56	60	64	68	37	40	37	38	46	45	49	49	53	59	60	64	*
2 China	15	29	32	32	30	31	31	30	43	64	80	80	80	22	34	39	34	34	34	34	33	45	65	*	*	*
3 Indonesia	1.3	4.4	7.4	12	19	20	21	30	37	53	66	73	68	12	*	*	*	*	*	*	*	*	*	*	*	*
4 Nigeria	11	11	11	11	12	12	12	11	15	17	18	20	23	*	*	*	*	*	*	15	13	*	*	*	*	*
5 South Africa	–	–	6.8	23	66	63	60	71	77	75	72	77	78	3	75	90	119	95	78	70	72	77	78	75	*	*
6 Bangladesh	6.4	14	18	23	23	24	26	30	35	40	54	65	66	14	21	23	26	25	26	27	31	*	*	*	*	*
7 Ethiopia	15	20	22	24	25	31	30	30	31	31	28	27	28	*	24	*	*	*	*	*	*	*	*	*	*	*
8 Pakistan	1.0	1.7	–	3.7	2.0	2.8	5.2	13	17	25	38	50	67	2.5	*	–	13	5.4	*	9.1	13	*	*	*	*	*
9 Philippines	0.4	0.4	2.9	9	18	44	52	57	64	69	71	75	75	85	78	75	64	65	59	*	*	*	*	*	*	*
10 DR Congo	40	47	43	53	50	47	49	47	53	59	60	59	61	42	*	*	*	*	*	*	*	*	*	*	*	*
11 Russian Federation	–	0.5	1.1	1.0	1.8	5.0	5.6	7.5	9.5	15	34	45	49	77	74	67	63	31	37	37	40	43	47	49	48	*
12 Viet Nam	30	59	78	83	83	82	84	87	86	89	84	86	82	59	77	84	85	83	*	*	*	*	*	*	*	*
13 Kenya	58	60	56	60	60	53	61	63	65	68	70	72	72	*	*	*	*	*	58	*	*	*	*	*	*	*
14 Brazil	–	–	–	3.8	3.7	7.0	7.4	8.9	17	43	51	64	69	73	73	73	66	72	73	70	76	75	82	82	82	78
15 UR Tanzania	61	60	57	58	56	52	51	48	49	51	50	50	51	*	*	*	*	*	*	*	*	*	*	*	*	*
16 Uganda	–	–	60	60	60	51	47	47	47	48	47	48	51	51	56	*	*	*	*	*	*	*	*	*	*	*
17 Zimbabwe	–	–	–	55	49	45	44	42	36	36	32	32	27	43	54	60	*	*	*	*	*	*	*	*	*	*
18 Thailand	–	0.3	5.2	22	41	48	76	68	74	74	77	74	72	58	48	37	*	*	*	*	*	*	*	*	*	*
19 Mozambique	59	55	53	53	50	47	45	45	45	46	47	49	49	*	*	*	*	*	*	*	*	*	*	*	*	*
20 Myanmar	–	27	27	30	34	50	60	69	78	88	102	111	116	27	30	29	*	*	*	61	*	*	*	*	*	*
21 Cambodia	40	34	44	48	54	50	48	57	62	62	68	62	61	*	43	*	*	*	*	*	*	*	*	*	*	*
22 Afghanistan	–	–	4.2	12	11	18	29	39	37	45	52	63	64	–	–	*	*	*	*	*	*	*	*	*	*	*
High-burden countries	**8.4**	**14**	**17**	**20**	**23**	**26**	**31**	**35**	**43**	**53**	**60**	**64**	**65**	**31**	**36**	**37**	**38**	**39**	**39**	**41**	**42**	**47**	**56**	**61**	**64**	**65**
AFR	23	26	30	35	37	36	37	43	45	46	46	47	47	33	43	42	47	43	41	42	44	46	47	47	47	47
AMR	26	26	29	33	36	43	42	45	49	57	62	72	73	68	69	74	71	73	73	73	74	74	76	76	78	76
EMR	12	10	12	19	21	25	27	32	34	39	46	52	60	25	27	24	34	32	27	30	32	34	39	46	52	60
EUR	2.6	3.5	4.6	11	11	12	14	22	24	26	37	53	51	64	63	58	58	46	47	43	43	53	48	50	58	55
SEAR	1.4	4.0	5.5	8.0	14	18	26	33	44	55	62	67	69	28	29	29	30	37	38	42	45	50	57	62	67	69
WPR	15	28	31	33	31	37	38	39	50	65	77	77	77	36	44	48	43	44	43	43	43	52	67	78	78	78
Global	**11**	**16**	**18**	**22**	**25**	**28**	**32**	**37**	**44**	**52**	**58**	**62**	**63**	**35**	**40**	**40**	**41**	**42**	**42**	**43**	**45**	**49**	**56**	**60**	**63**	**64**

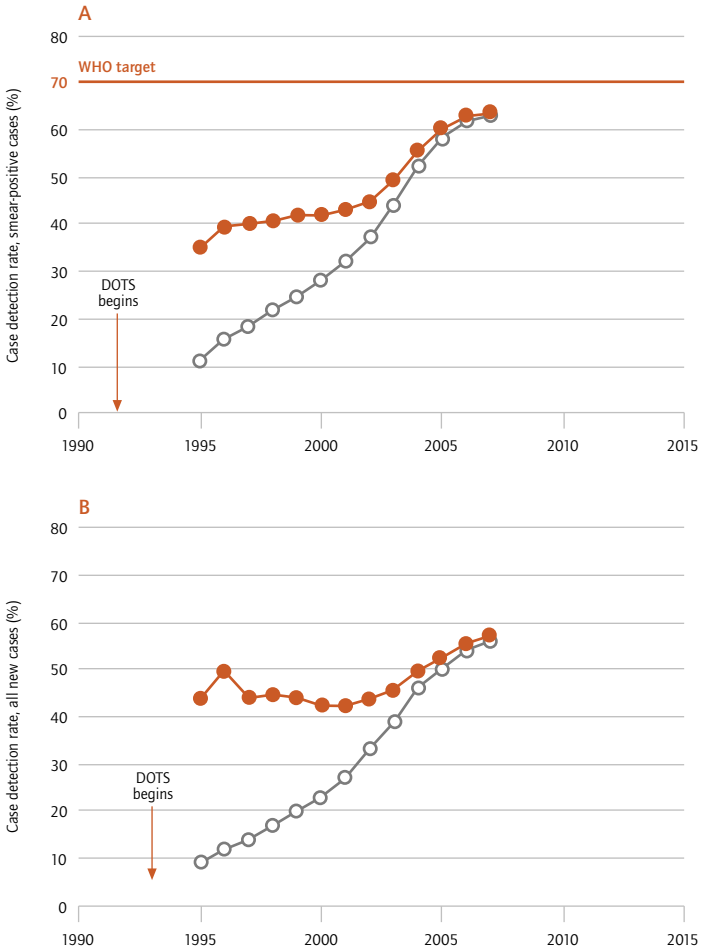
– Indicates not available.

[a] Estimates for all years are recalculated as new information becomes available and techniques are refined, so they may differ from those published previously.

* No additional data beyond DOTS report, either because country is 100% DOTS, or because no non-DOTS report was received.

■ **FIGURE 1.19**

Progress towards the 70% case detection target. (a) Open circles mark the number of new smear-positive cases notified under DOTS 1995–2007, expressed as a percentage of estimated new cases in each year. Closed circles show the total number of smear-positive cases notified (DOTS and non-DOTS) as a percentage of estimated cases. (b) As (a), but for all new cases (excluding relapses).



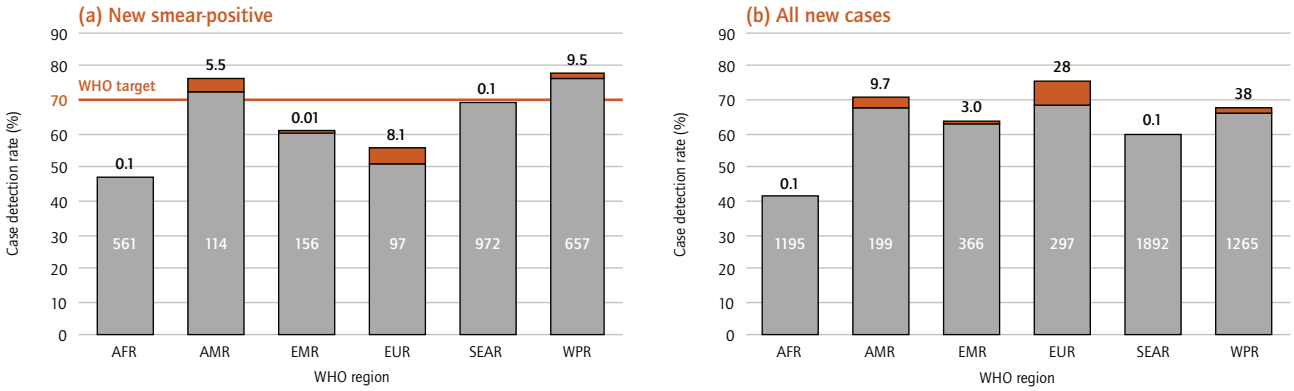
1.5.2 Case detection rate, DOTS programmes

In 2007, over 99% of all notified cases of smear-positive TB were from DOTS programmes and the case detection rate under DOTS was 63% (TABLE 1.6; FIGURE 1.19). This was a small improvement compared with 2006. National estimates of the case detection rate of new smear-positive cases suggest that 74 countries met the 70% target in 2007, down from 78 in 2006 (ANNEX 3). At regional level, the case detection rate was lowest in the African (47%) and European (51%) regions and highest in the Western Pacific Region (77%) (TABLE 1.6; FIGURE 1.20; FIGURE 1.21). The Western Pacific Region (since 2005) and the Region of the Americas (since 2006) are the only regions to have exceeded the 70% target, although the South-East Asia Region (at 69%) falls just short. The particularly low figure for case detection under DOTS in the European Region compared with the case detection rate (in DOTS and non-DOTS programmes) of all forms of TB of 75% (FIGURE 1.20) is explained by two factors: incomplete geographical coverage of DOTS and lack of emphasis on sputum smear microscopy.[1]

The implication that DOTS programmes in the African Region especially need to improve case detection comes with an important caveat. Efforts to assess improvements in case detection in this region have been hampered by the upward trend in incidence linked to the spread of HIV infection, such that it has been difficult to disentangle the effect of better programme performance and the HIV epidemic on increases in case notifications (see also SECTION 1.3 and BOX 1.2). More in-depth analyses of existing surveillance and programmatic data as well as data from forthcoming surveys of the prevalence of TB disease (TABLE 1.4) may indicate that case detection is higher than stated in this report.

■ **FIGURE 1.20**

Proportion of estimated cases notified under DOTS (grey portion of bars) and non-DOTS (red portion of the bar) in 2007 for (a) new smear-positive cases and (b) all new cases. The number of notified cases (in thousands) is shown in or above each portion or each bar.



[1] Countries in the European Region report substantial numbers of cases in whom disease is diagnosed by methods other than sputum smear microscopy. These cases are not necessarily smear-negative.

Although case detection of new smear-positive cases in DOTS programmes improved globally between 2006 and 2007, the increment between 2006 and 2007 (an extra 55 000 cases) was less than 1%, the smallest reported annual increase since 1995–1996 (TABLE 1.6; FIGURE 1.19; FIGURE 1.22). Most of the small increase in detected cases was attributable to India and Pakistan (in Pakistan this is linked to countrywide efforts to develop and scale up partnerships between the NTP and private providers, as described more fully in CHAPTER 2), and to a lesser extent Nigeria and South Africa (FIGURE 1.23). In the South-East Asia Region, the acceleration in case-finding after 2000 was attributable mostly to progress in Bangladesh, India, Indonesia and Myanmar. The Western Pacific Region is dominated by China, where case-finding expanded rapidly between 2002 and 2005; subsequently, little progress has been made (TABLE 1.6; ANNEX 1).

China and India accounted for an estimated 27% of all undetected new smear-positive cases in 2007. Nigeria accounted for 10% of undetected cases. These three countries are among eight HBCs that together accounted for 57% of all new smear-positive cases not detected by DOTS programmes in 2007 (FIGURE 1.24).

DOTS programmes detected 5.2 million new cases in 2007 (99% of all notifications) out of a total of 9.27 million estimated cases (TABLE 1.2; TABLE 1.5). This is equivalent to a case detection rate (all new cases) of 56% in 2007, a 2% increase from 54% in 2006.

1.6 Outcomes of treatment in DOTS programmes

1.6.1 New smear-positive cases

A total of 2.5 million new smear-positive cases were registered for treatment in DOTS programmes in 2006, approximately the same number that were notified that year (TABLE 1.7). The biggest discrepancies, where registered cases exceeded notifications, were in the Region of the Americas (Brazil) and in the Russian Federation and South Africa.

Globally, the rate of treatment success was 85% in 2006 (TABLE 1.7; TABLE 1.8). This means that 52% of the smear-positive cases estimated to have occurred in 2006 were treated successfully by DOTS programmes. Among all the patients treated under DOTS, 9.7% had no known outcome (defaulted, transferred, not evaluated). Treatment results for 13 consecutive cohorts (1994–2006) of new smear-positive patients show that the success rates have been 80% or higher in DOTS areas since 1998, even though the number of patients increased 10-fold from 240 000 in 1994 to 2.5 million in 2006 (TABLE 1.8).

The target for treatment success was reached at global level in 2006 because of the high treatment success rates reported from the South-East Asia and Western Pacific regions (87% and 92%, respectively; the latter figure is high enough to warrant further validation of the data). The DOTS treatment success rate reached or exceeded 85% in ten HBCs (TABLE 1.7), seven of which were in the South-East

FIGURE 1.21
Smear-positive case detection rate under DOTS, by WHO region, 1995–2007. Heavy line shows global DOTS case detection rate.

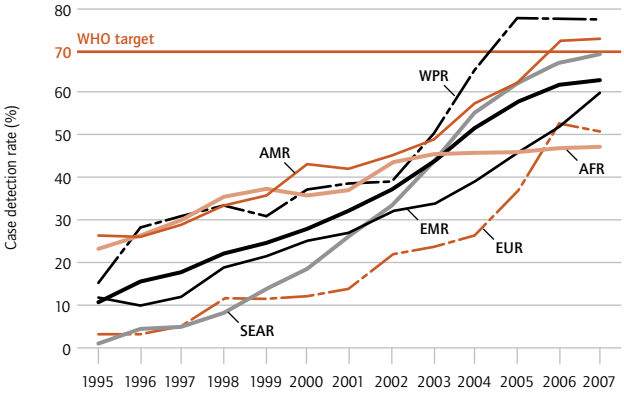
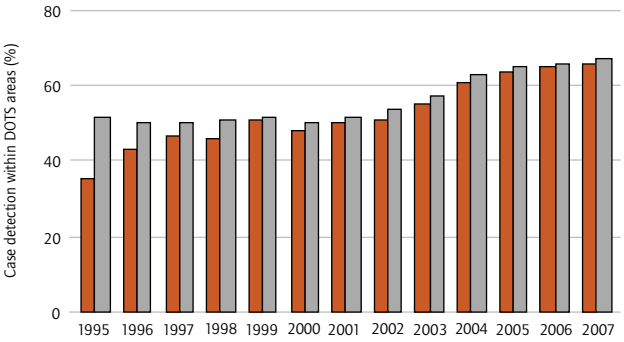


FIGURE 1.22
Smear-positive case detection rate within DOTS areas[a] for high-burden countries (red) and the world (grey), 1995–2007



[a] Calculated as DOTS case detection rate of new smear-positive cases divided by DOTS coverage

FIGURE 1.23
Contributions to the global increase in the number of new smear-positive cases notified under DOTS made by high-burden countries, 2006–2007

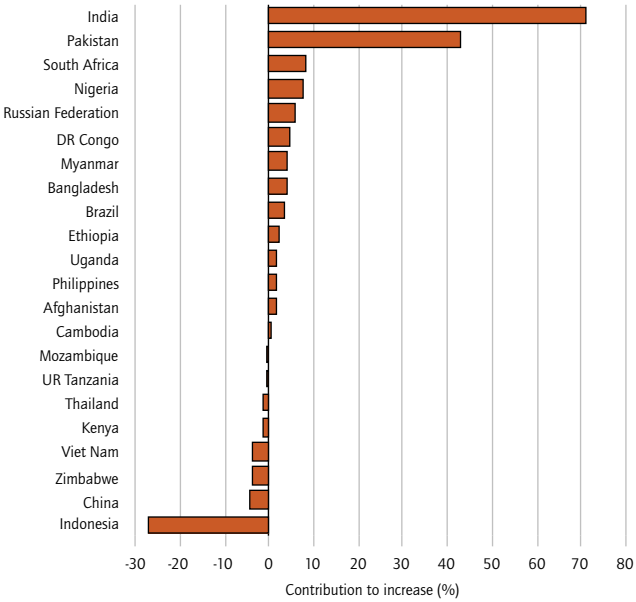


TABLE 1.7
Treatment outcomes for new smear-positive cases treated under DOTS, 2006 cohort

	NOTIFIED	REGISTERED[a]	REGST'D (%)	TREATMENT OUTCOMES (%)[a] CURED	COMPLETED TREATMENT	DIED	FAILED	DEFAULTED	TRANS-FERRED	NOT EVAL'D	TREATMENT SUCCESS (%)	% EST[b] CASES SUCCESSFULLY TREATED UNDER DOTS
1 India	553 797	553 302	100	84	2.1	4.6	2.3	6.4	0.8	0.03	86†	55
2 China	468 291	470 436	100	92	1.7	1.5	0.8	0.6	2.9	0	94†	75
3 Indonesia	175 320	175 320	100	83	8.5	2.1	0.6	4.6	1.7	0	91†	67
4 Nigeria	39 903	39 903	100	65	11	5.8	1.9	10	2.2	3.6	76	16
5 South Africa	131 099	139 516	106	63	11	7.3	1.7	9.1	5.2	2.9	74	60
6 Bangladesh	101 967	101 761	100	91	0.8	3.2	0.5	2.0	1.5	0.6	92†	59
7 Ethiopia	36 674	36 674	100	69	15	4.8	0.5	4.5	5.1	1.0	84	23
8 Pakistan	65 253	65 589	101	75	13	2.8	0.6	6.2	2.4	0	88†	44
9 Philippines	85 740	85 797	100	80	7.9	2.3	1.0	3.9	2.4	2.0	88†	66
10 DR Congo	63 488	63 488	100	82	4.6	5.4	1.3	4.9	2.2	0	86†	51
11 Russian Federation	29 989	30 745	103	56	2.7	12	15	9.6	4.8	0	58	27
12 Viet Nam	56 437	56 470	100	90	2.3	2.6	1.0	1.6	2.1	0.7	92†	79
13 Kenya	39 154	39 154	100	73	12	4.5	0.3	7.3	2.7	0	85†	61
14 Brazil	32 463	34 818	107	33	39	4.2	0.1	8.3	3.3	12	72	50
15 UR Tanzania	24 724	24 724	100	80	4.5	7.9	0.2	3.2	4.0	0	85	42
16 Uganda	20 364	20 364	100	29	41	5.7	0.6	13	4.7	6.9	70	33
17 Zimbabwe	12 718	16 205	127	54	6.0	7.6	0.1	5.3	8.4	19	60	24
18 Thailand	29 081	28 856	99	71	6.3	8.2	1.8	5.8	2.9	4.0	77	57
19 Mozambique	18 275	18 275	100	82	1.1	10	0.9	4.5	1.9	0	83	40
20 Myanmar	40 241	40 350	100	77	7.3	5.5	3.2	5.0	1.9	0	84	94
21 Cambodia	19 294	19 349	100	90	3.1	3.0	0.3	1.6	1.6	0	93†	58
22 Afghanistan	12 468	12 468	100	80	4.9	2.1	1.1	2.1	5.6	4.6	84	53
High-burden countries	**2 056 740**	**2 073 564**	**101**	**81**	**5.6**	**3.9**	**1.5**	**4.6**	**2.4**	**0.9**	**87†**	**56**
AFR	555 361	562 884	101	65	10	6.2	1.2	7.7	4.1	5.3	75	36
AMR	114 680	116 925	102	55	20	4.4	0.9	6.3	3.2	10	75	55
EMR	131 820	132 001	100	75	11	2.8	1.0	6.1	2.7	1.2	86	45
EUR	100 102	94 266	94	61	9.3	8.4	8.9	7.2	3.2	2.3	70	35
SEAR	938 572	937 764	100	84	3.6	4.1	1.8	5.4	1.2	0.2	87†	59
WPR	662 273	663 261	100	89	3.1	2.1	0.9	1.4	2.8	1.1	92†	71
Global	**2 502 808**	**2 507 101**	**100**	**78**	**6.3**	**4.2**	**1.6**	**5.0**	**2.5**	**2.2**	**85**	**52**

† Treatment success ≥ 85% (treatment success for UR Tanzania 84.7%, global 84.5%).

[a] Cohort: cases diagnosed during 2006 and treated/followed-up through 2007. See TABLE A2.1 and accompanying text for definitions of treatment outcomes. If the number registered was provided, this (or the sum of the outcomes, if greater) was used as the denominator for calculating treatment outcomes. If the number registered was missing, then the number notified (or the sum of the outcomes, if greater) was used as the denominator.

[b] Est: estimated cases for 2006 (as opposed to notified or registered for treatment).

FIGURE 1.24
Smear-positive TB cases undetected by DOTS programmes in eight high-burden countries, 2007. Numbers indicate the percentage of all missed cases that were missed by each country.

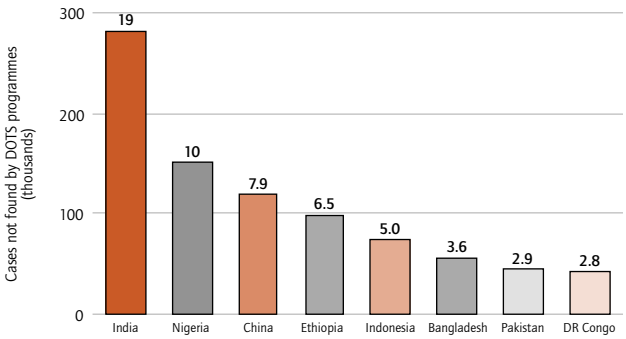


TABLE 1.8
Treatment success for new smear-positive cases treated under DOTS (%), 1994–2006 cohorts[a]

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
1 India	83	79	79	82	84	82	84	85	87	86	86	86	86
2 China	94	96	96	96	97	96	95	96	93	94	94	94	94
3 Indonesia	94	91	81	54	58	50	87	86	86	87	90	91	91
4 Nigeria	65	49	32	73	73	75	79	79	79	78	73	75	76
5 South Africa	–	–	69	73	74	60	66	65	68	67	70	71	74
6 Bangladesh	73	71	72	78	80	81	83	84	84	85	90	91	92
7 Ethiopia	74	61	73	72	74	76	80	76	76	70	79	78	84
8 Pakistan	74	70	–	67	66	70	74	77	78	79	82	83	88
9 Philippines	80	–	82	83	84	87	88	88	88	88	87	89	88
10 DR Congo	71	80	48	64	70	69	78	77	78	83	85	85	86
11 Russian Federation	–	65	62	67	68	65	68	67	67	61	59	58	58
12 Viet Nam	91	91	90	85	93	92	92	93	92	92	93	92	92
13 Kenya	73	75	77	65	77	78	80	80	79	80	80	82	85
14 Brazil	–	–	–	–	91	89	73	67	75	83	81	77	72
15 UR Tanzania	80	73	76	77	76	78	78	81	80	81	81	82	85
16 Uganda	–	–	33	40	62	61	63	56	60	68	70	73	70
17 Zimbabwe	–	–	–	–	70	73	69	71	67	66	54	68	60
18 Thailand	–	–	78	62	68	77	69	75	74	73	74	75	77
19 Mozambique	67	39	54	67	–	71	75	78	78	76	77	79	83
20 Myanmar	–	66	79	82	82	81	82	81	81	81	84	84	84
21 Cambodia	84	91	94	91	95	93	91	92	92	93	91	93	93
22 Afghanistan	–	–	–	45	33	87	86	84	87	86	89	90	84
High-burden countries	**87**	**83**	**78**	**81**	**83**	**81**	**84**	**84**	**83**	**84**	**86**	**86**	**87**
AFR	59	62	57	63	70	69	72	71	73	73	74	76	75
AMR	76	78	83	82	81	83	81	82	83	83	82	78	75
EMR	82	87	86	79	77	83	83	83	84	83	83	83	86
EUR	68	69	72	72	76	77	77	75	76	75	74	71	70
SEAR	80	74	77	72	72	73	83	84	85	85	87	87	87
WPR	90	91	93	93	95	94	92	93	90	91	91	92	92
Global	**77**	**79**	**77**	**79**	**81**	**80**	**82**	**82**	**82**	**83**	**84**	**85**	**85**

– Indicates not available.
[a] See notes for TABLE 1.7.

Asia and Western Pacific regions, and in 59 countries (up from 57 the previous year) in total (ANNEX 3). Treatment success rates of 90% or more were reported in Bangladesh, Cambodia, China, Indonesia and Viet Nam.

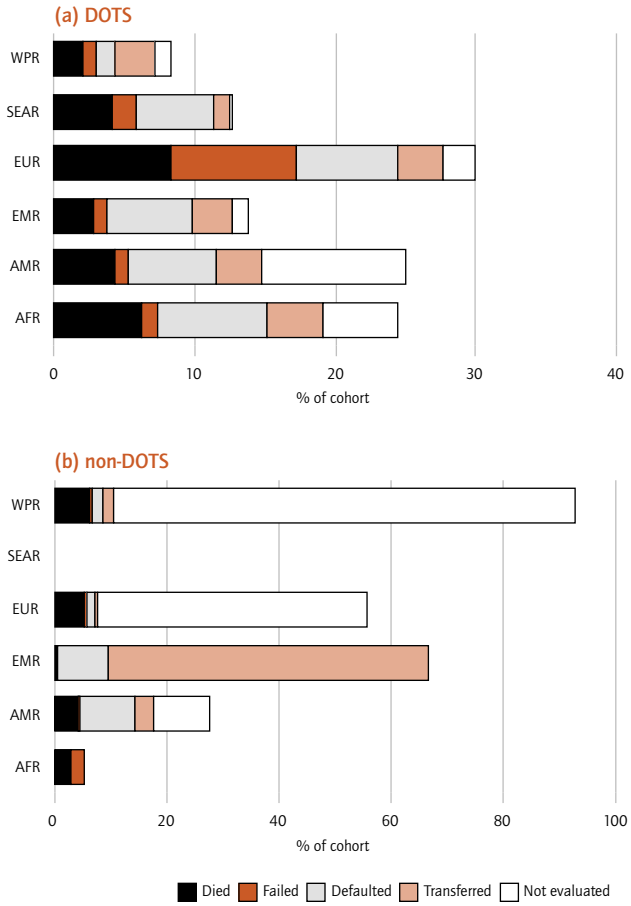
Treatment success rates in other regions in 2006 were 75% in the African Region, 86% in the Eastern Mediterranean Region (where the target was reached for the first time in 2006), 70% in the European Region (the lowest recorded since 1996) and 75% in the Region of the Americas (TABLE 1.7; TABLE 1.8). In the Region of the Americas, the treatment success rate has been worsening since 2002, related to the geographical expansion of DOTS to those parts of countries where health services are weaker. There was no evaluation of treatment outcome for 10% of patients in the region as a whole. Relatively low treatment success rates in the European Region are explained in large part by high rates of death and treatment failure in the Russian Federation, which are linked among other factors to drug resistance. Here, the treatment success rate was 58% in 2006, the lowest level since WHO began monitoring this indicator in 1995. Death and default rates remain high in the African Region, linked to high rates of HIV coinfection and weak health services: one or other of these indicators exceeded 10% in Mozambique, Nigeria and Uganda. However, Kenya achieved a treatment success rate of 85% in 2006 and the United Republic of Tanzania achieved a treatment success rate of 84.7%, indicating that it is possible to achieve the target of 85% in settings where a high proportion of patients are HIV-positive. Cure was not confirmed (by a final, negative sputum smear) for large numbers of patients in Brazil (39%), Ethiopia (15%), Nigeria (11%), Pakistan (13%), South Africa (11%) and Uganda (41%).

Variation in treatment outcomes among regions (TABLE 1.7; FIGURE 1.25) raises important questions about the quality of treatment, the quality of the data and how quickly these will improve in future.

1.6.2 Re-treatment cases

A total of 564 131 patients were re-treated in DOTS programmes in 2006 (TABLE 1.9), an increase from 531 228 patients in 2005. The re-treatment success rate in 2006 was 70%. As expected from the results of treating new patients, re-treatment success rates were lowest in the European

FIGURE 1.25
Outcomes for those patients not successfully treated in (a) DOTS and (b) non-DOTS areas, by WHO region, 2006 cohort



Region (42%) and highest in the Western Pacific Region (87%).

1.6.3 Comparison of treatment outcomes in HIV-positive and HIV-negative TB patients

Data on the outcomes of treatment for HIV-positive and HIV-negative TB patients were reported separately by between 31 and 55 countries, depending on the category of case (FIGURE 1.26; smear-negative and extrapulmonary cases are presented as one category, since separate analysis showed very similar treatment outcomes for these two types of case). These countries were mostly in the Region of the Americas and the European Region. There were few data for African countries (only for Ghana, Lesotho, Mauritania, Mauritius, Namibia and Zambia), even though Africa accounts for 79% of estimated HIV-positive cases. The data that were reported show lower treatment success rates among HIV-positive patients, due mainly to higher death rates and, to a lesser extent, higher default rates. A similar pattern existed for two regions that could be analysed separately (the Region of the Americas and the European Region; data not shown).

1.7 Progress towards reaching targets for case detection and treatment success

The global targets for both case detection (70%) and treatment success (85%) were achieved in 36 countries (up from 33 in 2005–2006) including four HBCs: China, Kenya, the Philippines and Viet Nam (FIGURE 1.27; FIGURE 1.28). Kenya is the first country in sub-Saharan Africa that is assessed to have achieved both targets, following new analysis of TB incidence and the case detection rate (BOX 1.2) and a treatment success rate that reached 85% for the first time in the 2006 cohort. Indonesia dropped out of the "target zone" (FIGURE 1.28) in 2007, possibly as a consequence of a temporary cessation of funding from a Global Fund grant delaying implementation of some programmatic activities.

The only region to have reached both targets is the Western Pacific Region, although the South-East Asia Region is very close. The Region of the Americas could achieve both targets if treatment outcomes could be improved by reducing the proportion of patients for whom treatment outcome is not evaluated. The African and European regions perform worst on both indicators.

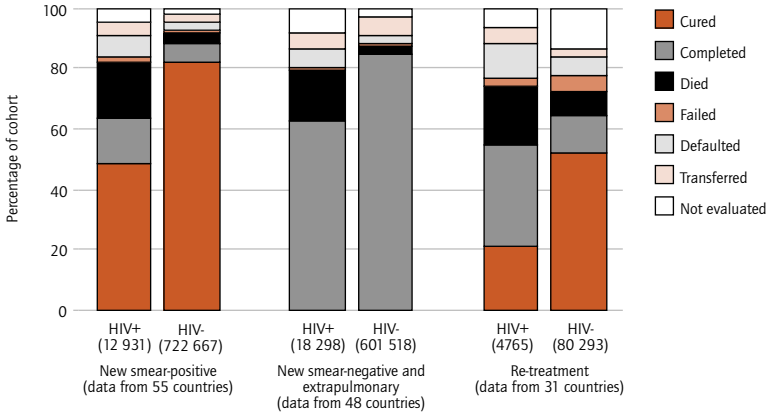
Progress can also be directly compared with the expectations set out in the Global Plan (TABLE 1.10), which was designed to achieve the MDG, Stop TB Partnership and WHA targets set for 2015 (SECTION 1.1). The case detection rate for new smear-positive cases in DOTS programmes in 2007, at 63%, lags behind the milestone of 68% in the Global Plan. The detection of smear-negative and extrapulmonary cases also lags behind the Global Plan, and by a larger amount (51% estimated for 2007 compared with the Global Plan milestone of 69%). More positively, progress in the treatment success rate is ahead of the Global Plan, at 85% compared with 83%. In addition, the absolute number of smear-pos-

TABLE 1.9
Re-treatment outcomes for smear-positive cases treated under DOTS, 2006 cohort[a]

		TREATMENT OUTCOMES (%)							
	REGISTERED	CURED	COMPLETED TREATMENT	DIED	FAILED	DEFAULTED	TRANS-FERRED	NOT EVAL'D	TREATMENT SUCCESS (%)
1 India	259 130	45	26	7.1	4.2	15	1.7	0.02	72
2 China	78 146	85	4.7	2.3	2.2	1.2	5.1	0	89†
3 Indonesia	4 227	61	16	4.5	2.5	11	5.0	0	77
4 Nigeria	4 605	60	17	3.6	7.1	9.7	2.6	0	77
5 South Africa	43 225	56	10	5.1	9.0	12	3.5	3.5	67
6 Bangladesh	4 211	70	7.1	4.5	2.2	3.9	3.5	8.4	77
7 Ethiopia	2 846	54	16	8.0	2.1	4.3	4.9	11	69
8 Pakistan	5 566	59	18	4.2	3.1	11	4.2	0.2	77
9 Philippines	3 293	63	17	5.4	4.4	4.7	2.5	3.4	80
10 DR Congo	6 345	63	3.7	7.6	3.2	14	2.6	6.2	67
11 Russian Federation	17 109	33	4.7	14	26	14	7.7	0	38
12 Viet Nam	7 500	79	4.3	5.9	5.2	3.2	2.9	0.1	83
13 Kenya	3 945	71	7.8	7.1	0.9	8.3	4.7	0	79
14 Brazil	4 955	15	28	5.7	1.7	16	11	23	43
15 UR Tanzania	4 639	38	39	12	0.6	3.9	4.0	2.0	78
16 Uganda	1 357	33	43	8.4	1.0	10	4.3	0	76
17 Zimbabwe	929	54	3.0	17	0.5	6.7	6.6	12	57
18 Thailand	2 191	53	8.6	13	5.5	7.2	4.9	7.5	62
19 Mozambique	1 818	63	2.1	12	1.8	7.0	14	0	65
20 Myanmar	8 866	50	20	12	6.5	7.4	4.4	0	70
21 Cambodia	1 389	48	37	6.2	2.2	1.9	4.3	0	85†
22 Afghanistan	1 132	74	5	2.7	2.3	2.2	6.3	7.9	79
High-burden countries	**467 424**	**54**	**19**	**6.4**	**5.0**	**12**	**3.1**	**0.9**	**73**
AFR	98 957	49	17	6.9	5.4	11	4.5	6.3	66
AMR	12 282	37	18	6.1	2.7	14	5.9	16	55
EMR	14 039	58	18	4.0	3.3	11	4.7	1.6	76
EUR	51 866	34	7.4	14	19	12	5.4	7.7	42
SEAR	290 910	47	25	7.1	4.5	14	2.0	0.2	72
WPR	96 159	80	6.3	3.0	2.6	1.7	5.1	1.0	87†
Global	**564 213**	**52**	**18**	**6.9**	**5.6**	**11**	**3.4**	**2.5**	**70**

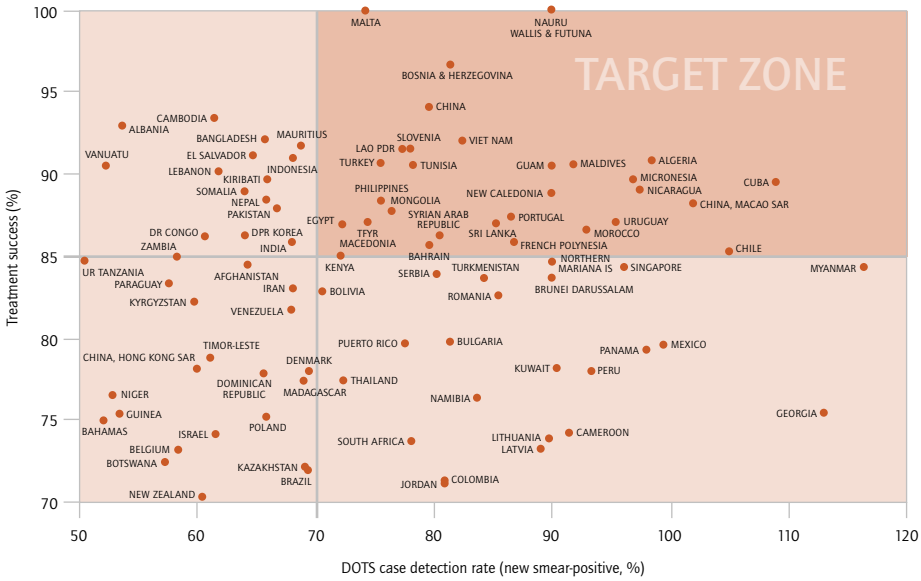
– Indicates not available.
† Treatment success ≥ 85%.
[a] See notes for TABLE 1.7.

FIGURE 1.26
Treatment outcomes for HIV-positive and HIV-negative TB patients, 2006 cohort. The numbers under the bars are the numbers of patients included in the cohort.



■ **FIGURE 1.27**

DOTS status in 2007, countries close to targets. 100 countries reported treatment success rates 70% or over and DOTS detection rates 50% or over. 36 countries (including 5 countries out of range of graph) have reached both targets; 2 in the African Region, 8 in the Region of the Americas, 6 in the Eastern Mediterranean Region, 6 in the European Region, 2 in the South-East Asia Region and 12 in the Western Pacific Region.



itive patients treated in DOTS programmes in 2007 (2.1 million) was higher than the number forecast in the Global Plan (1.8 million) because the estimated incidence of TB in 2007 was higher than anticipated by the Global Plan.

1.8 Summary

The latest estimates of the global burden of TB show that there were 9.27 million new cases of TB in 2007 (including 1.37 million cases among HIV-positive people), 1.32 million deaths from TB in HIV-negative people with an additional 0.46 million TB deaths in HIV-positive people, and 13.7 million prevalent cases (of which 687 000 were HIV-positive cases). There were 0.5 million cases of MDR-TB, of which 0.3 million were among people not previously treated for TB and 0.2 million were among previously treated TB cases. The estimates of cases and deaths in HIV-positive people in 2007 as well as in previous years are substantially higher than those published in previous years by WHO, and are based on new data that became available in 2008 and associated updates to analytical methods. The revised estimates suggest that TB cases and deaths from TB in HIV-positive people peaked in 2005, at 1.39 million and 0.48 million respectively. Collectively, these statistics show that TB remains a major global health problem.

The total number of global cases is still increasing in absolute terms as a result of population growth. Nonetheless, the number of incident cases per capita is falling globally, in five out of six WHO regions (the exception is Europe, where rates are approximately stable) and in seven out of nine epidemiological subregions (the exceptions are Eastern Europe and African countries with a low prevalence of HIV in the general population). If the global trend is confirmed by further monitoring, MDG Target 6.c will have been met by 2005 (following a peak in the incidence rate in 2004), well ahead of the target date of 2015. The more challenging targets of halving prevalence and death rates by 2015 compared with a baseline of 1990, set by the Stop TB Partnership, are unlikely to be achieved globally because of the

■ **FIGURE 1.28**

DOTS progress in high-burden countries, 2006–2007. Treatment success refers to cohorts of patients registered in 2005 or 2006, and evaluated, respectively, by the end of 2006 or 2007. Arrows mark progress in treatment success and DOTS case detection rate. Countries should enter the graph at top left, and proceed rightwards to the target zone. Countries from AFR, AMR, EMR and EUR are shown in red, those from SEAR and WPR are shown in black.

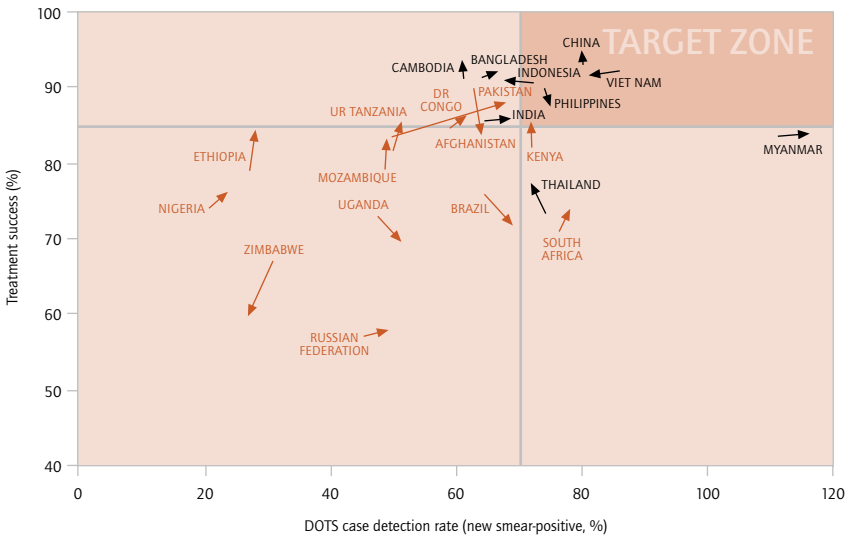


TABLE 1.10
DOTS expansion and enhancement in 2007: country reports compared with expectations given in the Global Plan

	COUNTRY REPORTS[a]	GLOBAL PLAN
	(MILLIONS OR PERCENTAGES)	
Number of new smear-positive cases notified under DOTS	2.5	2.2
Estimated number of new smear-positive cases	4.0	3.2
New smear-positive case detection rate under DOTS	63%	68%
Number of new smear-positive cases successfully treated under DOTS	2.1	1.8
Number of new smear-positive cases registered for treatment under DOTS	2.5	2.2
New smear-positive treatment success rate, 2006	85%	83%
Number of new smear-negative and extrapulmonary cases notified under DOTS	2.6	3.1
Estimated number of new smear-negative and extrapulmonary cases	5.1	4.5
New smear-negative and extra-pulmonary case detection rate under DOTS	51%	69%

[a] Includes only those countries in the Global Plan, i.e. countries in sub-regions Central Europe and Established Market Economies are excluded here.

enormous gap between rates in 2007 and the 2015 target in the African and European regions. However, three of six WHO regions are on track to meet both targets: these are the Eastern Mediterranean and South-East Asia regions, and the Region of the Americas. The Western Pacific Region is on track to achieve the prevalence target, but progress will have to accelerate from 2008 onwards, otherwise the mortality target may be narrowly missed. Implementation of recommendations for measuring progress towards the impact targets that have been made by the Global Task Force on TB Impact Measurement, including more in-depth analyses of the quality and coverage of existing surveillance data, surveys of the prevalence of TB disease in 21 global focus countries and strengthening of vital registration systems to improve the measurement of mortality, will considerably improve measurement of progress towards the impact targets as well as measurement of progress in TB control after 2015.

The WHA target of successfully treating 85% of new smear-positive patients was achieved at global level in 2006. It has also been achieved in three regions: in the Eastern Mediterranean Region (for the first time) and in the South-East Asia and Western Pacific regions, as well as in 59 countries (up from 57 the previous year). Treatment success rates remain well below the target in the other regions, especially the European Region.

With 5.2 million cases notified in DOTS programmes (99% of the total notified globally), of which 2.6 million (44%) were new smear-positive cases (also 99% of the total notified globally), the case detection rate for new smear-positive TB under DOTS was 63% in 2007, a very small increase from 62% in 2006. Much of the progress that did take place was in India and Pakistan, which in Pakistan was linked in particular to countrywide efforts to develop partnerships between the NTP and private providers. The percentage of estimated cases notified by DOTS and non-DOTS programmes combined was 64%. The slow rate of progress reinforces the observation in last year's report that progress in case detection has slowed since 2005 and that the WHA target of a case detection rate of at least 70%, originally set for 2000 and later reset to 2005, is still some way from being achieved. More positively, the Western Pacific Region and the Region of the Americas have achieved the target, as have 74 countries; at 69%, the South-East Asia Region is very close to doing so. The Western Pacific Region and 36 countries (up from 33 in 2006/7) appear to have achieved both the case detection and treatment success targets. Reaching the case detection target at global level requires greater efforts to detect and treat cases in all regions, using the range of interventions and approaches defined in the Stop TB Strategy that are discussed in the next chapter.

■ CHAPTER 2

Strategy

Two landmark documents in global TB control – the Stop TB Strategy[1] and the Global Plan to Stop TB[2] – were launched in 2006. The Stop TB Strategy, developed by WHO, sets out the interventions that need to be implemented to achieve the MDG, Stop TB Partnership and World Health Assembly targets discussed in CHAPTER 1. The Global Plan to Stop TB, developed by the Stop TB Partnership, sets out how, and at what scale, the strategy should be implemented over the decade 2006–2015 (see also CHAPTER 1). To monitor implementation of the strategy, WHO has asked countries to report on the implementation of TB control activities according to the strategy's major components and subcomponents (TABLE 2.1; TABLE 2.2) since 2007. In the 2008 round of data collection, countries were asked to report on activities implemented in 2007 and on activities planned for 2008 (see ANNEX 2 for further details about the data that were collected). In a few cases, projections for 2009 were also requested.

This chapter, structured in seven main sections, summarizes the major findings on global progress in implementing the Stop TB Strategy. Wherever possible, comparable data reported in previous years are also presented, to illustrate trends over time. The first section provides an overview of the completeness of reporting for each component of the Stop TB Strategy. The next six sections cover each of the six major components of the strategy in turn: pursue high-quality DOTS expansion and enhancement; address TB/HIV, MDR-TB, and the needs of poor and vulnerable populations; contribute to health system strengthening based on primary health care; engage all care providers; empower people with TB, and communities through partnership; and enable and promote research.[3] Further details about the implementation of all major components and subcomponents of the Stop TB Strategy are provided for each of the 22 HBCs in ANNEX 1.

■ TABLE 2.1
Components of the Stop TB Strategy

1. **Pursue high-quality DOTS expansion and enhancement**
   a. Secure political commitment, with adequate and sustained financing
   b. Ensure early case detection, and diagnosis through quality-assured bacteriology
   c. Provide standardized treatment with supervision, and patient support
   d. Ensure effective drug supply and management
   e. Monitor and evaluate performance and impact
2. **Address TB-HIV, MDR-TB, and the needs of poor and vulnerable populations**
   a. Scale up collaborative TB/HIV activities
   b. Scale up prevention and management of multidrug-resistant TB (MDR-TB)
   c. Address the needs of TB contacts, and of poor and vulnerable populations, including women, children, prisoners, refugees, migrants and ethnic minorities
3. **Contribute to health system strengthening based on primary health care**
   a. Help improve health policies, human resource development, financing, supplies, service delivery and information
   b. Strengthen infection control in health services, other congregate settings and households
   c. Upgrade laboratory networks, and implement the Practical Approach to Lung Health (PAL)
   d. Adapt successful approaches from other fields and sectors, and foster action on the social determinants of health
4. **Engage all care providers**
   a. Involve all public, voluntary, corporate and private providers through Public–Private Mix (PPM) approaches
   b. Promote use of the International Standards for TB Care (ISTC)
5. **Empower people with TB, and communities through partnership**
   a. Pursue advocacy, communication and social mobilization
   b. Foster community participation in TB care
   c. Promote use of the Patients' Charter for TB Care
6. **Enable and promote research**
   a. Conduct programme-based operational research, and introduce new tools into practice
   b. Advocate for and participate in research to develop new diagnostics, drugs and vaccines

■ TABLE 2.2
Technical elements of the DOTS strategy

Case detection through quality-assured bacteriology	Case detection among symptomatic patients self-reporting to health services, using sputum smear microscopy. Sputum culture is also used for diagnosis in some countries, but direct sputum smear microscopy should still be performed for all suspected cases.
Standardized treatment with supervision and patient support	Standardized short-course chemotherapy using regimens of 6–8 months for at least all confirmed smear-positive cases. Good case management includes directly observed treatment (DOT) during the intensive phase for all new smear-positive cases, during the continuation phase of regimens containing rifampicin and during the entirety of a re-treatment regimen. In countries that have consistently documented high rates of treatment success, DOT may be reserved for a subset of patients, as long as cohort analysis of treatment results is provided to document the outcome of all cases.
An effective drug supply and management system	Establishment and maintenance of a system to supply all essential anti-TB drugs and to ensure no interruption in their availability.
Monitoring and evaluation system, and impact measurement	Establishment and maintenance of a standardized recording and reporting system, allowing assessment of treatment results (see TABLE 2.7).

[1] *The Stop TB Strategy: building on and enhancing DOTS to meet the TB-related Millennium Development Goals*. Geneva, World Health Organization, 2006 (WHO/HTM/TB/2006.368).

[2] *The Global Plan to Stop TB, 2006–2015: actions for life towards a world free of tuberculosis*. Geneva, World Health Organization, 2006 (WHO/HTM/STB/2006.35).

[3] At the end of 2008, the wording used to describe the six components of the strategy was updated based on lessons learnt and feedback received. For the updated wording, see TABLE 2.1.

TABLE 2.3
Reporting on implementation of the Stop TB Strategy, 2007. Number of countries (out of 196 countries reporting) answering given percentage of questions on each sub-component of the strategy.

	COMPLETENESS OF REPORTING			
	<50%	50–75%	75–90%	>90%
1. DOTS expansion and enhancement				
Political commitment	4	15	0	177
Overview of services for diagnosis and treatment of TB	12	13	14	157
Laboratory diagnostic services	23	9	17	147
Drug management	14	16	166	0
Monitoring and evaluation, including impact measurement*	0	0	36	160
2. TB/HIV, MDR-TB and other challenges				
Collaborative TB/HIV activities				
Mechanisms for collaboration and policy development	17	6	17	156
HIV-testing for TB patients, provision of CPT and ART	55	33	14	92
Intensified TB case-finding and IPT for HIV-positive people	89	12	12	83
Treatment outcomes of HIV-positive TB patients	0	0	133	63
Management of MDR-TB				
Policy and stage of implementation	11	11	21	153
Diagnosis and treatment of MDR-TB	24	15	22	135
Treatment outcomes of MDR-TB patients	138	54	0	4
High-risk groups and special situations	21	15	19	141
3. Health system strengthening				
Health system stengthening and integration of TB control within primary health care	24	0	2	170
Practical Approach to Lung Health (PAL)	35	15	24	122
Human resource development	16	28	13	139
4. Engaging all care providers				
Public–Private and Public–Public Mix approaches (PPM)	77	118	0	1
International Standards for Tuberculosis Care	29	1	24	142
5. Empowering people with TB, and communities				
Advocacy, communication and social mobilization (ACSM)	16	3	24	153
Community participation in TB control	32	4	5	155
Patients' Charter for Tuberculosis Care	33	14	0	149
6. Enabling and promoting research				
Operational research	30	38	5	123
Research to develop new diagnostics, drugs and vaccines	28	4	6	158

* include data on case notifications by type and age/sex and treatment outcomes.

2.1 Data reported to WHO in 2008

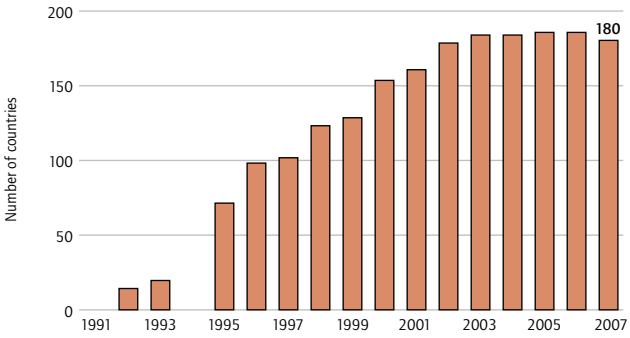
The data that were reported to WHO in 2008 are summarized in TABLE 2.3.[1] A total of 196 (out of 212) countries and territories (hereafter "countries") reported data; these countries collectively account for 99.6% of the world's estimated TB cases. Among countries which reported, at least 75% of the requested data were provided by 70–80% of countries for most sections of the data collection form. The topics for which reporting of data was much less complete were collaborative TB/HIV activities, treatment outcomes for patients with multidrug-resistant TB (MDR-TB), and public–public and public–private mix (PPM). For HBCs specifically, a similar pattern existed (data not shown).

2.2 DOTS expansion and enhancement

2.2.1 DOTS coverage and numbers of patients treated

The total number of countries implementing DOTS increased steadily from 1995 to 2003, and has since remained stable at around 180 countries (FIGURE 2.1). All 22 HBCs have had DOTS programmes since 2000. DOTS coverage within

FIGURE 2.1
Number of countries and territories implementing DOTS (out of a total of 212), 1991–2007



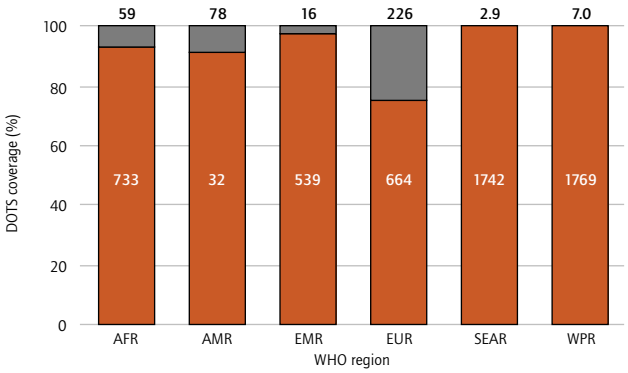
[1] The wording used in TABLE 2.3 is the wording used on the 2008 data collection form, which was distributed before the update to the wording of the Stop TB Strategy presented in TABLE 2.1.

TABLE 2.4
Progress in DOTS implementation, 1995–2007

	PERCENT OF POPULATION COVERED BY DOTS												
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
1 India	1.5	2.0	2.3	9.0	14	30	45	52	67	84	91	100	100
2 China	49	60	64	64	64	68	68	78	91	96	100	100	100
3 Indonesia	6.0	14	28	80	90	98	98	98	98	98	98	98	100
4 Nigeria	47	30	40	45	45	47	55	55	60	65	65	75	91
5 South Africa	–	0	13	22	66	77	77	98	100	93	94	100	100
6 Bangladesh	41	65	80	90	90	92	95	95	99	99	99	100	100
7 Ethiopia	39	39	48	64	63	85	70	95	95	70	90	100	95
8 Pakistan	2.0	8.0	–	8.0	8.0	9.0	24	44	66	79	100	100	99
9 Philippines	4.3	2.0	15	17	43	90	95	98	100	100	100	100	100
10 DR Congo	47	51	60	60	62	70	70	70	75	75	100	100	100
11 Russian Federation	–	2.3	2.3	5.0	5.0	12	16	25	25	45	83	84	100
12 Viet Nam	50	95	93	96	99	100	100	100	100	100	100	100	100
13 Kenya	15	100	100	100	100	100	100	100	100	100	100	100	100
14 Brazil	–	0	0	3.0	7.0	7.0	32	25	34	52	68	86	75
15 UR Tanzania	98	100	100	100	100	100	100	100	100	100	100	100	100
16 Uganda	–	0	100	100	100	100	100	100	100	100	100	100	100
17 Zimbabwe	–	0	0	100	12	100	100	100	100	100	100	100	100
18 Thailand	–	1.1	4.0	32	59	70	82	100	100	100	100	100	100
19 Mozambique	97	100	84	95	–	100	100	100	100	100	100	100	100
20 Myanmar	–	59	60	60	64	77	84	88	95	95	95	95	95
21 Cambodia	60	80	88	100	100	99	100	100	100	100	100	100	100
22 Afghanistan	–	–	12	11	14	15	12	38	53	68	81	97	97
High-burden countries	**24**	**32**	**36**	**43**	**45**	**55**	**61**	**68**	**79**	**87**	**94**	**98**	**98**
AFR	43	46	56	61	56	71	70	81	85	83	88	92	93
AMR	12	48	50	55	65	68	73	73	78	83	88	93	91
EMR	16	12	18	33	51	65	71	77	87	90	97	98	97
EUR	5.4	8.2	17	22	23	26	31	39	41	46	59	67	75
SEAR	6.7	12	16	29	36	49	60	66	77	89	93	100	100
WPR	43	55	57	58	57	67	68	77	90	94	98	100	100
Global	**22**	**32**	**37**	**43**	**47**	**57**	**62**	**69**	**77**	**83**	**89**	**93**	**94**

Zero indicates that a report was received, but the country had not implemented DOTS.
– Indicates that no report was received.

FIGURE 2.2
DOTS coverage by WHO region, 2007. The red portion of each bar shows DOTS coverage as a percent of the population. The numbers in each bar show the population (in millions) within (red portion) or outside (grey portion) DOTS areas.



countries has also increased since 1995 (TABLE 2.4). By the end of 2007, 94% of the world's population lived in countries that had adopted DOTS, and population coverage was reported to exceed 90% in all regions except Europe (FIGURE 2.2). However, 100% DOTS coverage does not mean that all providers in a country are implementing the DOTS strategy (see also SECTION 2.5).

As reported in greater detail in CHAPTER 1, 5.5 million new and relapse cases of TB were notified by DOTS programmes in 2007, of which 2.6 million (47%) were new sputum smear-positive cases. These numbers represented 98.5% and 99.1% of total TB case notifications (that is, notifications from DOTS and non-DOTS programmes combined), respectively. The percentage of all estimated new cases of smear-positive TB detected by DOTS programmes – the case detection rate – was 63% globally in 2007; the case detection rate for all cases was 56%. A cumulative total of 37.3 million new and relapse cases have been treated in DOTS programmes in the 13 years from 1995 (when reliable records began) to 2007. Globally, the treatment success rate was 85% in the 2006 cohort. The Western Pacific Region has

achieved both global targets related to DOTS implementation (a case detection rate of 70% and a treatment success rate of 85%), and the South-East Asia Region and the Region of the Americas are close to doing so. The other three regions (African, European and Eastern Mediterranean regions) are much further from achieving these targets. This short summary of the data that are presented in much greater detail in CHAPTER 1 provides a context for the information provided in the rest of this chapter.

2.2.2 Political commitment

Scaling up implementation of all components of the Stop TB Strategy while maintaining strong basic DOTS services requires sustained political commitment. Indicators of political commitment include the existence of a national strategic plan for TB control and the percentage of total funding required for TB control that is funded from domestic sources.

A total of 155 countries (84% of those reporting), including all HBCs, had a national strategic plan for TB control, including all countries in the African, Eastern Mediterranean and South East Asia regions that reported data. Domestic funding between 2002 and 2009 has increased in absolute terms in almost all of the HBCs; examples of countries with particularly large increases are Brazil, China, Indonesia, Mozambique, Nigeria and the Russian Federation. However, as a percentage of total funding for TB control, domestic funding has been relatively stable or has fallen in all of the 20 HBCs for which an assessment can be made (there are insufficient data for South Africa and Thailand). Additional information about national plans and financial indicators in HBCs are included in ANNEX 1. Further details about financing for TB control in all countries are provided in CHAPTER 3 and ANNEX 3.

2.2.3 Early case detection through quality-assured bacteriology

Sputum smear microscopy is the primary tool for diagnosis of TB in most countries. Among reporting countries, 83% (136/164) used sputum smear microscopy for all individuals with suspected pulmonary TB in all diagnostic sites in 2007.

TABLE 2.5
Stock-outs of laboratory reagents and of first-line anti-TB drugs, 2007

	LABORATORY REAGENTS AND SUPPLIES		FIRST-LINE ANTI-TB DRUGS	
	CENTRAL	PERIPHERAL	CENTRAL	PERIPHERAL
1 India	N	Some units	N	N
2 China	N	N	N	Some units
3 Indonesia	Not applicable	Some units	N	N
4 Nigeria	N	N	Y	Some units
5 South Africa	N	N	Y	N
6 Bangladesh	–	–	N	N
7 Ethiopia	N	Some units	Y	Some units
8 Pakistan	N	Some units	N	N
9 Philippines	N	N	Y	Some units
10 DR Congo	N	N	Y	Some units
11 Russian Federation	N	N	–	–
12 Viet Nam	Y	–	Y	Y
13 Kenya	N	N	N	N
14 Brazil	N	N	N	N
15 UR Tanzania	N	N	N	N
16 Uganda	N	Some units	Y	Some units
17 Zimbabwe	Y	Some units	Y	Some units
18 Thailand	N	N	N	N
19 Mozambique	Y	Some units	N	Some units
20 Myanmar	N	N	N	N
21 Cambodia	N	N	N	N
22 Afghanistan	N	N	Y	N
High-burden countries[a]	**3/21**	**7/22**	**9/20**	**9/22**
AFR (46)[b]	10/37	16/36	13/36	15/36
AMR (44)	6/38	6/39	3/34	5/36
EMR (22)	2/22	3/22	3/22	2/22
EUR (53)	4/41	10/40	3/41	6/40
SEAR (11)	0/10	3/11	0/10	0/11
WPR (36)	5/32	5/32	10/31	7/31
Global (212)	**27/180**	**43/180**	**32/174**	**35/176**

– Indicates information not provided.

[a] In the lower part of the table the numerator of each fraction is the number of countries reporting stock-outs; the denominator is the number of countries providing information.

[b] The number of countries in each region is shown in parentheses.

TABLE 2.6
Coverage of laboratory services, high-burden countries, 2007

			ACCESS TO DIAGNOSTIC SERVICES						LABORATORIES INCLUDED IN EXTERNAL QUALITY ASSURANCE (EQA) FOR SPUTUM SMEAR MICROSCOPY	
			SPUTUM SMEAR		CULTURE		DST			
	POPULATION THOUSANDS	NATIONAL REFERENCE LABORATORY (NRL)[a]	NUMBER OF LABS	PER 100 000 POP	NUMBER OF LABS	PER 5 MILLION POP[b]	NUMBER OF LABS	PER 10 MILLION POP[b]	NUMBER	%
1 *India*	1 169 016	Y	12 184	1.0	*11*	*0.05*	*11*	*0.1*	11 386	93
2 *China*	1 328 630	Y	3 294	0.2	*327*	*1.2*	*187*	*1.4*	3 294	100
3 *Indonesia*	231 627	N	4 855	2.1	*41*	*0.9*	*11*	*0.5*	4 855	100
4 *Nigeria*	148 093	Y	794	0.5	*2*	*0.1*	*1*	*0.1*	347	44
5 South Africa	48 577	Y	249	0.5	15	1.5	10	2.1	241	97
6 *Bangladesh*	158 665	Y	753	0.5	*4*	*0.1*	*2*	*0.1*	753	100
7 Ethiopia	83 099	Y	833	1.0	1	0.1	1	0.1	–	–
8 *Pakistan*	163 902	N	1 131	0.7	*3*	*0.1*	*1*	*0.1*	360	32
9 *Philippines*	87 960	Y	2 374	2.7	*3*	*0.2*	*3*	*0.3*	2 374	100
10 DR Congo	62 636	Y	1 205	1.9	1	0.1	1	0.2	1 023	85
11 *Russian Federation*	142 499	Y	4 048	2.8	*965*	*34*	*280*	*20*	–	–
12 Viet Nam	87 375	Y	737	0.8	17	1.0	2	0.2	–	–
13 Kenya	37 538	Y	930	2.5	5	0.7	1	0.3	37	4.0
14 *Brazil*	191 791	Y	4 044	2.1	*193*	*5.0*	*38*	*2.0*	1 819	45
15 UR Tanzania	40 454	Y	717	1.8	3	0.4	1	0.2	–	–
16 Uganda	30 884	Y	716	2.3	3	0.5	2	0.6	716	100
17 Zimbabwe	13 349	Y	180	1.3	1	0.4	1	0.7	0	0
18 Thailand	63 884	Y	1 023	1.6	65	5.1	14	2.2	1 023	100
19 Mozambique	21 397	Y	252	1.2	1	0.2	1	0.5	252	100
20 Myanmar	48 798	Y	324	0.7	2	0.2	1	0.2	54	17
21 Cambodia	14 444	Y	201	1.4	3	1.0	1	0.7	186	93
22 Afghanistan	27 145	Y	500	1.8	1	0.2	–	–	360	72
High-burden countries (22)	**4 201 761**	**20**	**41 344**	**1.0**	**1 667**	**2.0**	**570**	**1.4**	**29 080**	**70**
AFR	765 283	34	8 547	1.1	110	0.7	45	0.6	4 466	52
AMR	599 140	29	13 874	2.3	1 487	12	111	1.9	9 040	65
EMR	555 064	18	4 094	0.7	162	1.5	36	0.6	2 158	53
EUR	611 415	43	6 744	1.1	2 216	18	762	12	284	4.2
SEAR	1 745 394	10	20 090	1.2	129	0.4	43	0.2	18 372	91
WPR	1 621 633	27	7 341	0.5	459	1.4	224	1.4	6 262	85
Global	**5 897 929**	**161**	**60 690**	**1.0**	**4 563**	**3.9**	**1 221**	**2.1**	**40 582**	**67**

– Indicates information not provided; labs, laboratories; pop, population.

[a] In the lower part of the table the number of countries answering "yes" to this question is shown.

[b] To provide culture for diagnosis of paediatric, extrapulmonary and ss–/HIV+ TB, as well as DST for re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population. However, for countries with large populations (*country name and numbers shown in italics*), one laboratory for culture and DST in each major administrative area (e.g. province) may be sufficient. See also note in country profiles (ANNEX 1).

This included 17 of the 22 HBCs. In Mozambique, South Africa and Zimbabwe, only some patients were screened by microscopy; no data were reported by Viet Nam. Laboratory supplies for microscopy were also generally reported to be adequate. Among all countries, 15% (27/180) reported stock-outs at the central level and 24% (43/180) reported stock-outs at the peripheral level (TABLE 2.5). Three HBCs (Mozambique, Viet Nam and Zimbabwe) reported stock-outs at the central level (Bangladesh did not provide any data). Seven HBCs reported stock-outs at the peripheral level in some units, while Bangladesh and Viet Nam did not report data (TABLE 2.5).

The average number of microscopy laboratories exceeds the target of at least 1 per 100 000 population in four regions (TABLE 2.6). The average number in the Western Pacific Region is 0.5 per 100 000 population, reflecting a comparatively low number of laboratories relative to population size in the largest country in the region (China). Besides China, other HBCs with a relatively low number of microscopy laboratories per 100 000 population include Bangladesh, Myanmar, Nigeria and Pakistan. External quality assurance (EQA) was conducted for a high proportion of laboratories in the South-East Asia and Western Pacific regions (91% and 85% respectively), with much lower figures in other regions. Among the HBCs, coverage of EQA was reported as 100% in seven countries: Bangladesh, China, Indonesia, the Philippines, Uganda, Mozambique and Thailand.

Laboratories with the capacity to provide culture and DST services are essential for diagnosis of drug-resistant TB; culture services are also important for diagnosis of smear-negative TB, especially in settings where the prevalence of

HIV is high. However, capacity to perform culture and DST was seriously limited in most HBCs in 2007 (TABLE 2.6). Only seven HBCs (Brazil, Cambodia, China, the Russian Federation, South Africa, Thailand and Viet Nam) had at least one culture laboratory per 5 million population (the currently recommended level); for more than half of the HBCs, the figure was below 0.5. The Russian Federation is exceptional, with 34 culture laboratories per 5 million population. Four regions have more than one culture laboratory per 5 million population, but the distribution of laboratories among countries in these regions is uneven. A similar pattern exists for DST. Only five HBCs reported having at least 1 laboratory with DST capacity per 10 million population (the currently recommended level): Brazil, China, the Russian Federation (20 per 10 million population), South Africa and Thailand. Among the remaining HBCs, most had less than 1 laboratory with DST capacity per 20 million population.

While 94% of all countries that reported data (161/171) indicated that a national reference laboratory (NRL) was available (TABLE 2.6), the functionality and/or performance of these laboratories is mostly unknown. Two HBCs (Indonesia and Pakistan) indicated that no NRL was available, although all had plans to establish one within the next 1–2 years.

Most laboratories with capacity to test for drug susceptibility, including many NRLs, are able only to provide DST of first-line drugs. The emergence of extensively drug-resistant TB (XDR-TB) in an increasing number of countries globally highlights the importance of access to DST of second-line drugs. These services were available to 63 of 142 reporting countries (44%) in 2007, either within or outside the country; however, their quality is unclear, and only nine HBCs had access to second-line DST. In Africa, very few countries apart from South Africa have any capacity (or access to capacity) to diagnose MDR-TB and XDR-TB.

In response to the need to increase the availability of quality-assured culture and DST services including second-line DST, the supranational reference laboratory network (SRLN) is being expanded. Currently, there are 26 SRLs: two in the African Region, five in the Region of the Americas, 11 in the European Region, one in the Eastern Mediterranean Region, two in the South-East Asian Region and five in the Western Pacific Region (FIGURE 2.3). All regions have plans to expand these networks, and in some regions a formalized evaluation and accreditation process is being developed.

Notwithstanding the expansion of the SRLN, the general shortage of laboratory capacity to provide culture and DST based on conventional technologies demonstrates the need for rapid introduction of new diagnostic tools. In order to facilitate the development of policy to guide the implementation of new diagnostic tools, WHO has established a structured process for evaluating and translating research findings into policy and practice (the latest WHO policy on TB diagnosis is summarized in BOX 2.1).[1] Such policy guidance needs

[1] Moving research findings into new WHO policies. Geneva, World Health Organization, 2008 (available at http://www.who.int/tb/dots/laboratory/policy/en/index4.html; accessed January 2009).

BOX 2.1

Recent WHO policy changes in diagnosis of TB

1. WHO policy on smear microscopy and case detection

With the prerequisite of a functional external microscopy quality assurance (EQA) system, with blinded rechecking, the new definition of a smear-positive TB case is "a patient with one or more initial sputum smear examinations positive for acid fast bacilli (AFB)". Further information including evidence for this policy can be found at: http://www.who.int/tb/dots/laboratory/policy/en/index1.html

2. WHO policy on the use of liquid medium for culture and drug susceptibility testing (DST) in middle-income and low-income countries

WHO recommends the use of commercial liquid systems (the standard of care for TB diagnosis and patient management in developed countries) for culture and DST in middle-income and low-income countries, within the context of national laboratory strengthening plans and using a phased approach to implementation at the country level. Further information including prerequisites for the phased introduction of this technology can be found at: http://www.who.int/tb/dots/laboratory/policy/en/index3.html

3. WHO policy on the use of molecular line probe assays

WHO recommends the use of molecular line probe assays for the rapid detection of MDR-TB cases, within the context of national laboratory strengthening plans and using a phased approach to implementation at the country level. Further information including prerequisites for the phased introduction of this technology can be found at: http://www.who.int/tb/publications/2008/who_htm_tb_2008_392.pdf

4. WHO policy recommendations on DST of second-line anti-TB drugs

An Expert Group convened by WHO in 2007 reviewed current evidence and re-confirmed that the laboratory diagnosis of MDR-TB and XDR-TB under good laboratory practice is reliable and reproducible. In addition, this consultative process culminated in an interim policy guidance document summarizing available evidence on the second-line DST methods, and providing recommendations for which drugs to test as well as the critical concentrations. The document also provides programmatic advice on designing diagnostic algorithms, required laboratory capacity and safety requirements. The Expert Group also developed a detailed outline for the update of the 2001 technical guidelines for DST of second-line drugs, incorporating the newer technologies. A writing committee was established with the aim of releasing the updated guidelines by the middle of 2009. *Policy guidance on drug-susceptibility testing (DST) of second-line antituberculosis drugs* can be found at: http://www.who.int/tb/publications/2008/who_htm_tb_2008_392.pdf

FIGURE 2.3
Tuberculosis supranational reference laboratory network, 2007

BOX 2.2

The Global Laboratory Initiative (GLI)

The GLI is part of the Stop TB Partnership, with a secretariat housed in WHO. Its major objectives include providing global standards for laboratory services, promoting quality assurance and adequate laboratory biosafety, accelerating human resource development for laboratory activities, and facilitating partnerships that will enable the establishment or expansion of laboratory services capable of absorbing new technologies. A current example is a GLI project that aims to accelerate access to new diagnostic tools for MDR-TB that have recently been endorsed by WHO. The project is being implemented in 16 of the high MDR-TB burden countries (for definition of these countries see TABLE 2.10), in close collaboration with the Foundation for Innovative New Diagnostics and the Global Drug Facility, with funding from UNITAID.

to be followed by implementation (a process referred to as "retooling"; see also SECTION 2.7).[1] Most regions have introduced one or more new tools (for example, liquid culture and DST, endorsed by WHO in 2007; and molecular line probe assays, endorsed by WHO in 2008). Ongoing monitoring will be used to assess the uptake of these tools and their impact on diagnosis and treatment outcomes.

In most resource-constrained countries, uptake of new tools requires considerable strengthening of laboratory infrastructure, deployment of additional human resources and funding for the purchase of new technologies. To help to address these challenges, the Global Laboratory Initiative (GLI) was established in 2007 (BOX 2.2).

2.2.4 Standardized treatment with supervision, and patient support

In 2007, all of the 146 countries reporting data, including all HBCs, provided treatment with standardized short-course chemotherapy (SCC). There were 105 countries using the six-month Category I regimen and 23 countries using an eight-month regimen that does not include rifampicin in the continuation phase of treatment. The remaining 18 countries did not specify the regimen that was being used. Of the HBCs, four use an eight-month regimen (Ethiopia, Nigeria, Pakistan and Uganda), of which two (Pakistan and Nigeria) plan to switch to the six-month regimen in 2009. Of the 35

[1] *Moving research findings into new WHO policies.* Geneva, World Health Organization, 2008 (available at http://www.who.int/tb/dots/laboratory/policy/en/index4.html; accessed January 2009).

countries that reported using regimens based on intermittent treatment, 18 use thrice-weekly treatment in the continuation phase only, five use a thrice-weekly regimen throughout treatment and five use a twice-weekly regimen in the continuation phase; seven countries did not state what kind of intermittent regimen was used. Fixed-dose combinations (FDCs) of two, three or four drugs were being used by 75 countries during the two-month intensive phase of treatment, while 61 countries were using two-drug FDCs in the continuation phase of treatment. Among 167 reporting countries, 79 (including 13 HBCs) purchased paediatric formulations of anti-TB drugs.

Health-care workers are the main providers of directly observed therapy (DOT) during the initial phase of treatment in 86% (150/174) of reporting countries, with a community or family member being the main provider in the remaining countries. In 63% (109/173) of reporting countries, health-care workers are also the main providers of DOT in the continuation phase of treatment. Among HBCs, DOT was provided in some units and/or for some patients only in Thailand, for some patients in all units in Myanmar, and for some units only in Uganda and Zimbabwe.

In almost all reporting countries (90%, 166/180), including all HBCs, anti-TB drugs are provided free of charge to all patients being treated with the Category I regimen under DOTS. Patient support to encourage adherence to treatment was reported mainly by countries in the European Region; examples included incentives and enablers such as food parcels and tickets for public transport, and provision of psychological counselling.

2.2.5 Drug supply and management system

Most countries (82%, 142/174) reported an uninterrupted supply of first-line TB drugs at the central level; the figure was similar (80%, 141/176) for the peripheral level (TABLE 2.5). Stock-outs at both central and peripheral levels were most frequent in the African Region, and included stock-outs at the peripheral level in six of the region's nine HBCs. Notably, no stock-outs were reported by countries in the South-East Asia Region.

The continuing occurrence of stock-outs demonstrates the need for better planning of procurement, monitoring of drug supplies and distribution capacity. More timely ordering of drugs by principal recipients of Global Fund grants and closer coordination between principal recipients and NTPs would also help in some countries.

Fewer countries reported data about the availability of second-line anti-TB drugs. Shortages at the central level occurred in 15% of reporting countries (25/168); the figure at peripheral level was slightly lower (11%, 18/162). Shortages occurred mostly in the Region of the Americas (seven countries), the African Region (five countries) and the European Region (seven countries). Among HBCs, only the Democratic Republic of the Congo reported shortages of second-line drugs.

At the global level, the Stop TB Partnership's Global Drug Facility (GDF) and Green Light Committee (GLC) are contributing to strengthened drug supply and drug management systems.[1] By the end of 2008, the GDF had provided first-line anti-TB drugs to 89 countries and the GLC has approved the use of second-line drugs in 134 projects in 60 countries (see also SECTION 2.3.2). Funding from UNITAID is also allowing the development of stockpiles of anti-TB drugs and the establishment of a strategic revolving fund to provide lines of credit for the purchase of second-line drugs. Grants from UNITAID have already supported the supply of quality-assured paediatric formulations to more than 50 countries. Additional first-line anti-TB drugs were prequalified by WHO in 2008, and more dossiers for prequalification were submitted for second-line drugs and paediatric formulations of first-line drugs. Besides supplying drugs, the GDF has also given priority to building capacity in drug procurement and management, for example through country missions and workshops. With the expansion of the TB Technical Assistance Mechanism known as TBTEAM (BOX 2.3), it is anticipated that technical assistance for drug management as well as many other components of TB control will be increased.

BOX 2.3

Providing technical assistance for TB control: the role of TBTEAM

The TB Technical Assistance Mechanism, known as TBTEAM, was established by the Stop TB Partnership in 2007. TBTEAM is designed to facilitate access to high-quality, well-coordinated technical assistance, which is widely recognized as being needed to fully implement the Stop TB Strategy and the Global Plan. TBTEAM has developed a roster of experts, tools for tracking missions and training opportunities around the world, as well as a directory of technical partners. Requests for technical assistance can be sent to the TBTEAM secretariat based in WHO headquarters, either directly or via channels such as WHO country offices and TBTEAM focal points at regional and country levels.

By the end of 2008, 839 missions and events had been recorded in the TBTEAM database, and 60 of the 81 requests for technical assistance had been responded to successfully. TBTEAM has also provided financial support for 140 country missions.

A recent external assessment of TBTEAM acknowledged the service provided by TBTEAM to countries in need of technical assistance as well as its efforts to provide funding for such assistance. This assessment has also provided guidance related to the future direction of TBTEAM, including how to best engage all partners. A plan to implement the recommendations of the external assessment is being developed following broad agreement with these recommendations during a meeting of TBTEAM partners in October 2008.

Further details about TBTEAM are available at: http://www.stoptb.org/wg/tbteam

2.2.6 Monitoring and evaluation

Routine monitoring of TB control is crucial to understand trends in the TB epidemic and progress in TB control. Col-

[1] Information about the work of the GDF, the GLC and UNITAID was provided by their secretariats rather than through the annual data collection form.

TABLE 2.7
TB data management and recording and reporting systems, 2007

	DATA FOR INDIVIDUAL TB PATIENTS ACCESSIBLE AT NTP CENTRAL OFFICE	TB DATA STORED IN A RELATIONAL DATABASE MANAGEMENT SYSTEM[a]		TB DATA FROM ALL THE BASIC MANAGEMENT UNITS RECEIVED BY CENTRAL NTP OFFICE		NTP PRODUCES ANNUAL REPORT
		STAND-ALONE	WEB-BASED	CASE-FINDING, 2007	TREATMENT OUTCOMES, 2006	
1 India	N	N	N	Y	Y	Y
2 China	Y	–	Y	Y	Y	Y
3 Indonesia	N	N	N	N	N	Y
4 Nigeria	N	N	N	Y	Y	Y
5 South Africa	N	–	Y	Y	Y	N
6 Bangladesh	N	Y	–	Y	Y	Y
7 Ethiopia	N	N	N	–	–	Y
8 Pakistan	N	–	Y	–	–	Y
9 Philippines	N	N	N	–	–	Y
10 DR Congo	N	N	N	Y	Y	N
11 Russian Federation	Y	Y	–	Y	N	Y
12 Viet Nam	–	–	–	–	–	–
13 Kenya	N	N	N	Y	Y	Y
14 Brazil	Y	–	Y	Y	Y	N
15 UR Tanzania	Y	Y	–	Y	Y	Y
16 Uganda	N	N	N	N	N	Y
17 Zimbabwe	N	N	N	N	N	Y
18 Thailand	N	N	N	N	N	Y
19 Mozambique	N	N	N	Y	Y	Y
20 Myanmar	N	Y	–	N	N	Y
21 Cambodia	Y	–	–	Y	Y	Y
22 Afghanistan	N	Y	–	Y	Y	Y
High-burden countries[b]	**5/21**	**5/21**	**4/21**	**13/19**	**12/19**	**18/21**
AFR (46)c	9/37	10/37	2/37	22/35	22/33	29/37
AMR (44)	23/38	7/38	4/38	20/31	20/30	24/38
EMR (22)	13/22	10/22	4/22	17/22	16/22	18/22
EUR (53)	40/43	19/42	8/42	29/35	27/35	27/41
SEAR (11)	2/11	4/11	0/11	7/11	7/11	9/11
WPR (36)	28/33	12/31	5/31	21/28	21/28	20/31
Global (212)	**115/184**	**62/181**	**23/181**	**116/162**	**113/159**	**127/180**

– Indicates information not provided or not applicable.

[a] A relational database management system (RDBMS) is an application or system that allows users to store and easily access a large amount of data. It is usually accessible to several people at the same time and allows users to enter/upload and edit/update the data. It also allows users to produce standard and/or customized analyses and reports.

[b] In the lower part of the table the numerator of each fraction is the number of countries providing an affirmative answer (i.e. yes); the denominator is the number of countries providing information.

[c] The number of countries in each region is shown in parentheses.

lection of data on key indicators allows documentation of achievements, identification of challenges, better estimation of the epidemiological burden of TB and informed planning. Monitoring is most informative when there are clear targets or benchmarks of good performance for the indicators on which data are collected, when data management practices ensure that data are complete, accurate and reported on time, when data are analysed using appropriate methods and when data are used to inform the design and implementation of interventions to control TB.

In 2007, 63% (115/184) of NTPs had access to data for individual patients (as opposed to aggregated data for cohorts of patients) at the central office (TABLE 2.7). This included five HBCs (Brazil, Cambodia, China, the Russian Federation and the United Republic of Tanzania), and a particularly high proportion of countries in the European and Western Pacific regions (93% and 85% of reporting countries, respectively). In the remaining countries, data at the central office were received from lower administrative levels in an aggregated format. Among these countries, around 20% could not confirm whether or not data about case notifications and treatment outcomes had been reported by all management units (for example, all districts). About 30% of the remaining countries with aggregated data reported that some data were missing. This highlights the need for greater efforts to ensure complete reporting of data, and for better monitoring of the completeness of reporting at the central level (see also SECTION 1.3 in CHAPTER 1).

Many countries produce an annual report, including 71% of the 180 reporting countries and almost all countries in the Eastern Mediterranean and South-East Asia regions (TABLE 2.7).

The optimum system for managing data is a relational database management system (RDBMS). This allows a large amount of data to be entered or uploaded, validated, stored, edited and updated, with access by multiple users. It also allows the production of standard and customized analyses and reports. To date, however, the use of such systems is relatively limited. Less than 50% of countries have an RDBMS, with around one quarter of these being web-based systems (including four HBCs – Brazil, China, Pakistan and South Africa). Some of these systems were customized for a particular country.[1] Other countries use spreadsheet-based systems (e.g. Excel) to hold and analyse their data. Management and analysis of data is much more difficult as well as time-consuming in such systems, and as a result data can be lost or errors introduced.

More countries need to introduce an RDBMS to improve data quality and to facilitate management, analysis, presentation and use of data. Existing options include OpenMRS (Open Medical Records System), DHIS (District Health Information System) or ENRS (Electronic National Record System), which are all open-access and generic software.[2] While generic, these systems can be adapted to the needs of particular countries and are supported by a global community of developers and implementers. A recent example of the successful introduction of an open-source RDBMS is provided in BOX 2.4.

Besides routine recording and reporting of data, evaluation of trends in incidence, prevalence and mortality (impact measurement) requires in-depth analysis of surveillance data (case notifications and mortality data from vital registration systems) and programmatic data, combined with periodic surveys of the prevalence of TB disease in some countries. The latest WHO estimates of trends in incidence, prevalence and mortality, recent recommendations about how impact measurement should be done and the latest data on progress at country level are provided in CHAPTER 1.

BOX 2.4

Introducing District Health Information Software (DHIS) in Myanmar

DHIS is a flexible, open-source (free-of-charge) software that was developed in 1994 to facilitate collection, transmission, storage, analysis, presentation and use of the health information systems programme (HISP; www.hisp.org). It was piloted in several countries in Africa and Asia including Ethiopia, India, Malawi, Mozambique, Nigeria, Myanmar, South Africa, the United Republic of Tanzania and Viet Nam. Given the dynamic nature of data management, the software is designed to be flexible and can be adapted to changing needs at local and national levels.

The NTP in Myanmar had long recognized the value of an electronic recording and reporting system, but it had proved difficult to identify a suitable solution. In 2007, following discussions between the NTP and WHO staff, it was agreed to explore the option of DHIS. With the assistance of consultants who are part of a network of developers, DHIS was customized for use in Myanmar, and staff at central and state or divisional levels were trained. The system was then tested for six months, during which programming bugs were identified and removed.

In early 2008, 32 staff from the central unit of the NTP, all state or divisional TB officers and all statistical clerks were trained. The 14 (out of 17) states and divisions that implement NTP services were equipped with a computer. The DHIS was installed in June and July 2008, with on-the-job training provided by staff from WHO. The system was tested in the last six months of 2008 by all the states and divisions, and remaining programming bugs were resolved by consultants. Further supervisory visits and refresher training courses are planned for 2009. DHIS has already reduced the workload associated with data management and analysis.

The experience of Myanmar shows that when there is strong commitment from the NTP, sufficient funding, external expertise and appropriate training, the DHIS can be successfully adapted and implemented to manage TB data in a high-burden country. The flexibility of the software allows for rapid and low-cost customization (instead of development from scratch). The DHIS could be relevant in many other countries.

2.3 Address TB/HIV, MDR-TB, and the needs of poor and vulnerable populations

2.3.1 Collaborative TB/HIV activities

Globally, the latest data suggests that there were 1.4 million new HIV-positive TB cases in 2007 (out of a total of 9.3 million incident cases of TB). This estimate is much higher than figures previously published by WHO in this series of annual reports. In this context, it is important to highlight that the estimated total number of incident TB cases (HIV-positive and HIV-negative combined) has changed only slightly. The reason for the much higher estimated number of *HIV-positive* TB cases is that the *proportion* of incident cases of TB who are estimated to be infected with HIV has been revised upwards, based on much more extensive data about HIV prevalence in TB patients. These data became available mostly in 2008 following the rapid expansion of routine HIV testing since 2005–2006, notably in African countries (as documented below). Further details about these new estimates, and the methods used to produce them, are provided in CHAPTER 1 and ANNEX 2 respectively. The African Region accounts for 79% of estimated HIV-positive TB cases; most of the remaining cases are in the South-East Asia Region (TABLE 2.8).

Collaborative TB/HIV activities are essential to ensure that HIV-positive TB patients are identified and treated appropriately, and to prevent TB in HIV-positive people.[3] These activities include establishing mechanisms for collaboration between TB and HIV programmes (coordinating bodies, joint TB/HIV planning, monitoring and evaluation, HIV surveillance); infection control in health-care and congregate settings; HIV testing of TB patients and, for those TB patients infected with HIV, co-trimoxazole preventive therapy (CPT)

[1] http://www.who.int/tb/err/catalogue
[2] See: http://openmrs.org, DHIS (www.hisp.org) or ENRS (www.emro.who.int/stb/enrs.htm).
[3] *Interim policy on collaborative TB/HIV activities*. Geneva, World Health Organization, 2004 (WHO/HTM/TB/2004.330; WHO/HTM/HIV/2004.1).

TABLE 2.8
HIV testing and treatment in TB patients, by WHO region, 2007

	NUMBER OF TB PATIENTS WITH KNOWN HIV STATUS (THOUSANDS)	% OF NOTIFIED TB PATIENTS TESTED FOR HIV	% OF TESTED TB PATIENTS HIV-POSITIVE	% OF ESTIMATED HIV-POSITIVE TB CASES[a] IDENTIFIED BY TESTING	% OF IDENTIFIED HIV-POSITIVE TB PATIENTS STARTED ON CPT	% OF IDENTIFIED HIV-POSITIVE TB PATIENTS STARTED ON ART	REGIONAL DISTRIBUTION OF ESTIMATED HIV-POSITIVE TB CASES
AFR	492	37	51	23	66	33	79
AMR	114	49	13	44	36	77	2.4
EMR	4.2	1.1	12	2.3	35	65	1.5
EUR	169	35	2.5	16	52	16	3.1
SEAR	122	5.5	15	12	37	17	11
WPR	95	6.6	7.0	13	45	28	3.7
Global	**996**	**16**	**30**	**22**	**63**	**34**	**100**

[a] Includes estimated HIV-positive TB cases in countries which did not provide information on testing.

FIGURE 2.4
Mechanisms for collaboration and national policies for collaborative TB/HIV activities, 63 priority countries, 2006–2007. Numbers under bars show the percentage of total estimated HIV-positive TB cases accounted for by reporting countries.

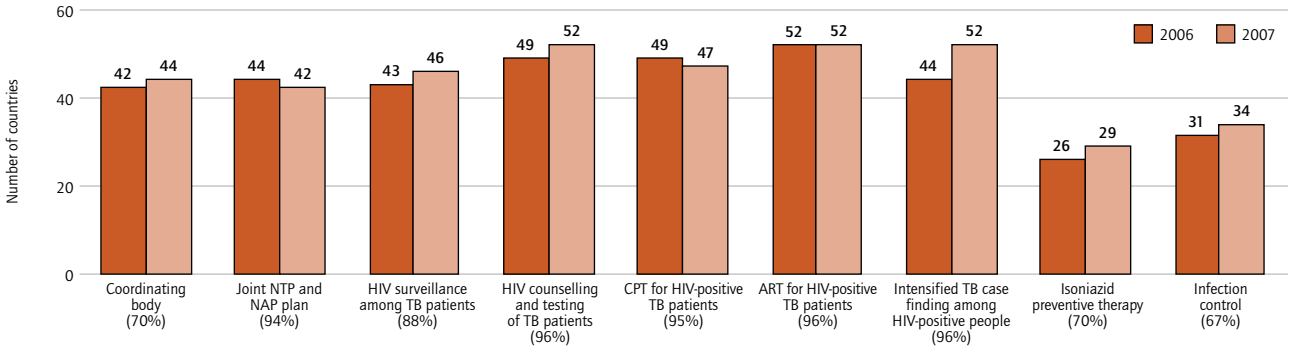
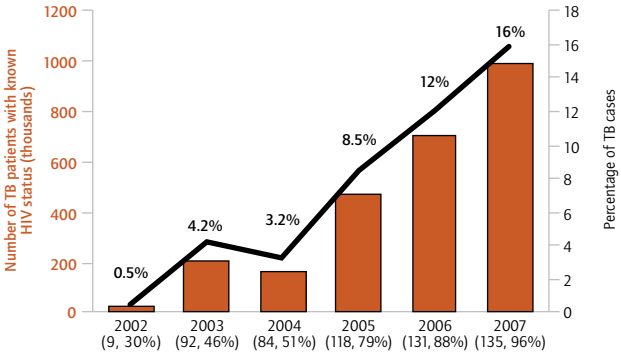


FIGURE 2.5
HIV testing for TB patients, all countries, 2002–2007. Number (bars) and percentage (line) of notified new and re-treatment TB cases for which the HIV status of the patient was recorded in the TB register. The numbers under each bar show the number of countries reporting data, followed by the percentage of total estimated HIV-positive TB cases accounted for by reporting countries.



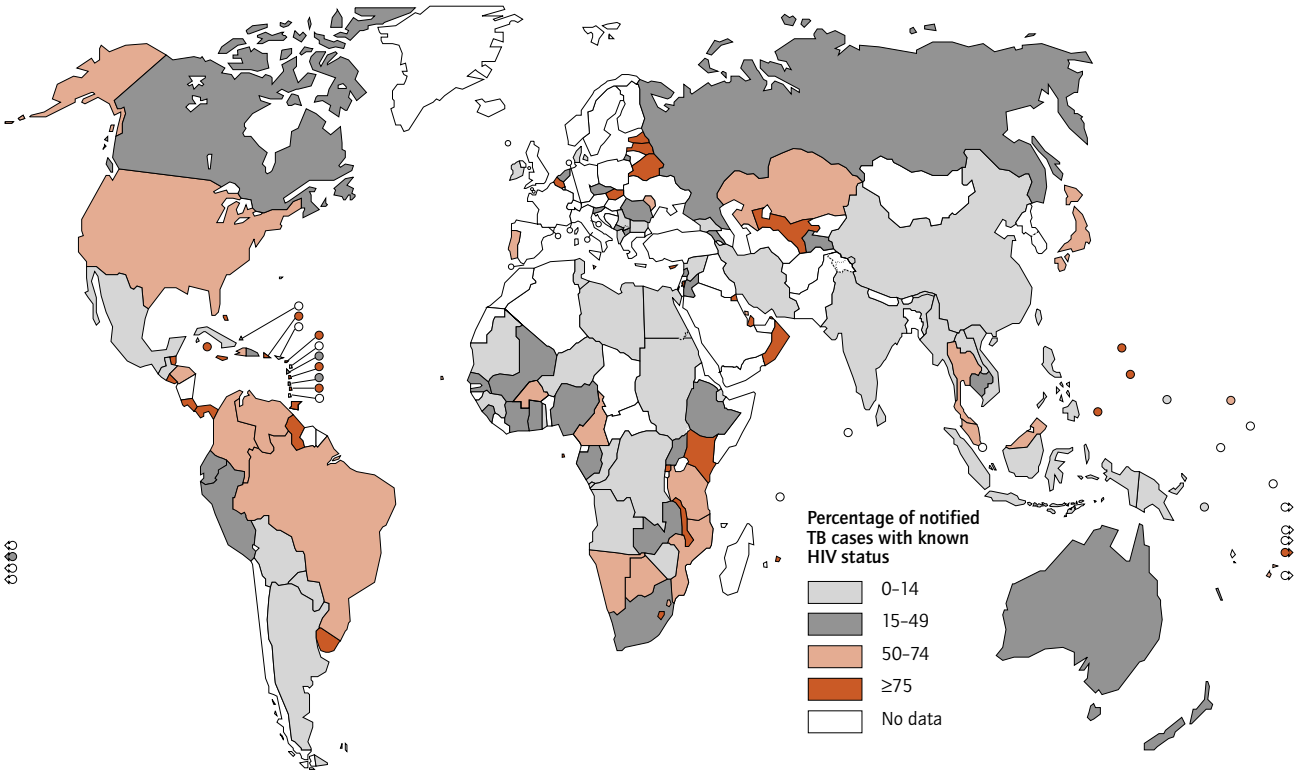
and antiretroviral therapy (ART); and intensified TB case-finding among people living with HIV followed by isoniazid preventive therapy (IPT) for those without active TB.

Mechanisms for collaboration and policy development

Among 63 countries that have been identified as priorities for the implementation of collaborative TB/HIV interventions at global level[1] and which collectively account for 97% of estimated HIV-positive cases worldwide, approximately two-thirds had established coordinating bodies, developed a joint TB/HIV plan and were undertaking HIV surveillance by 2007 (FIGURE 2.4). Around 50 of these 63 countries had policies for HIV counselling and testing among TB patients, as well as for the provision of CPT and ART to those coinfected with HIV. A relatively high number of countries (n=52) also had policies for intensified case-finding among HIV-positive people. In contrast, a smaller number of countries had policies related to IPT (29 countries) and infection control (34 countries). While there was variation in the extent to which mechanisms for collaboration or policies were in place in 2007, there was generally an improvement compared with 2006 (the exceptions were joint TB/HIV planning and provision of CPT). When all countries that reported data are con-

[1] Refers to 41 countries that were identified as priorities at global level in 2002 and that account for 97% of estimated HIV-positive TB cases globally, plus 22 additional countries that UNAIDS has defined as having a generalized HIV epidemic. See ANNEX 2 for a list of the 63 countries.

■ **FIGURE 2.6**
HIV testing for TB patients, 2007



sidered, the number of countries with policies is much higher, but the fraction of the global number of HIV-positive TB cases covered is almost the same (data not shown).

HIV testing of TB patients

The provision of HIV testing for TB patients is a critical entry point to interventions for both treatment and prevention. There was a substantial increase in the number of TB patients with known HIV status between 2002 and 2007, from 21 806 patients across nine countries in 2002 (less than 1% of notified TB cases) to 1.0 million patients across 135 countries in 2007 – equivalent to 16% of notified TB cases (FIGURE 2.5). In the African Region, the HIV status of 491 755 TB patients was known in 2007; this represented 37% of all notified cases, up from 22% in 2006 (TABLE 2.8). These aggregated figures conceal considerable variation in testing rates among countries (FIGURE 2.6). Among countries with a high prevalence of HIV among TB patients, Kenya, Malawi, Lesotho, Rwanda and Swaziland stand out as having the highest testing rates in 2007. Globally, there were 65 countries (14 in the African Region) where the HIV status of more than 50% of notified TB cases was known; these countries include 23 of the 63 countries that have been defined as high TB/HIV burden countries, and collectively account for 23% of the estimated total number of HIV-positive TB cases.[1] This progress in knowledge of HIV status of TB patients is impressive, although the high variability in current testing rates also shows that there is much further scope for improvement.

This increase in numbers of TB patients with known HIV status may be explained in part by the increase in the number of countries reporting data and the share of the global number of HIV-positive TB cases accounted for by reporting countries (see numbers and percentages below the bars of FIGURE 2.5). Clearer evidence that the provision of HIV testing has increased since 2004 is presented in FIGURE 2.7. This shows the number of TB patients with known HIV status in 60 countries that reported data for all four years 2004–2007. The number of TB patients with known HIV status in 11 African countries representing 48% of estimated HIV-positive TB cases globally (and 61% of cases in the African Region, data not shown) increased almost seven times in four years, while the percentage of all notified cases with known status increased from 7.6% to 48%. Outside the African Region, the number of patients with known HIV status also increased, but by a much smaller amount in absolute terms.

Across all reporting countries (n=119), a total of 296 995 HIV-positive TB patients were identified. These detected patients represent 22% of the estimated number of incident HIV-positive TB cases in 2007, although there was considerable variation among regions (TABLE 2.8).

[1] The total of 65 countries is higher than the total of 49 countries for which direct measurements of HIV prevalence in TB patients were used to estimate the global total of HIV-positive TB cases. For the additional 15 countries (which are mostly islands with small populations), estimates of HIV in the general population are not available and these countries are not included in global estimates of HIV-positive cases.

FIGURE 2.7
HIV testing in the 60 countries that reported data for each year 2004–2007. The number above each bar shows the percentage of notified TB cases that were tested for HIV.

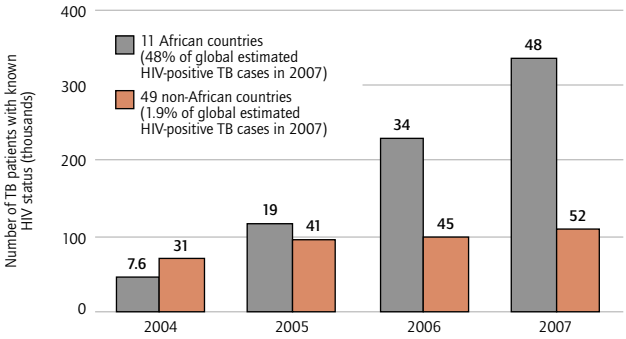


FIGURE 2.8
Co-trimoxazole preventive therapy for HIV-positive TB patients, 2002–2007. The numbers under each bar show the number of countries reporting data, followed by the percentage of total estimated HIV-positive TB cases accounted for by reporting countries.

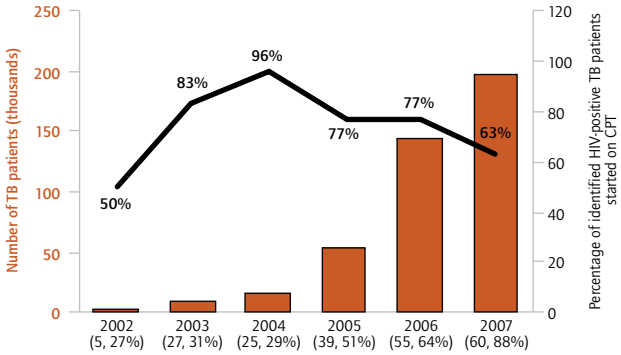
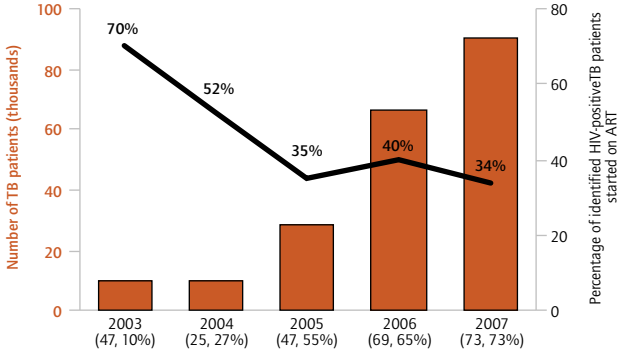


FIGURE 2.9
Antiretroviral therapy for HIV-positive TB patients, 2003–2007. The numbers under each bar show the number of countries reporting data, followed by the percentage of total estimated HIV-positive TB cases accounted for by reporting countries.



Provision of CPT and ART to HIV-positive TB patients

A major reason for promoting HIV testing in TB patients is to facilitate provision of CPT and ART to HIV-positive patients. The number of HIV-positive TB patients treated with CPT has steadily increased in absolute terms, reaching almost 200 000 in 2007. However, this has been accompanied by a fall in the percentage of TB patients in whom HIV is diagnosed who are treated with CPT, to 63% in 2007 (FIGURE 2.8). A similar pattern exists for ART. The total number of HIV-positive patients enrolled on ART has grown steadily, reaching around 90 000 patients in 2007, but the proportion of diagnosed HIV-positive patients started on treatment fell to 34%. In the African Region specifically, the proportion of patients in whom HIV infection was diagnosed and who were started on CPT reached 66% in 2007; the figure for ART was 33% (TABLE 2.8).

These figures for CPT and ART show that the provision of treatment interventions is not keeping pace with the increase in HIV testing. For ART, a possible explanation is the disparity between the number of health facilities offering TB treatment as well as HIV testing and counselling, and the number of facilities where ART is provided (BOX 2.5).

Intensified TB case-finding and provision of IPT among HIV-positive people

Screening for TB among HIV-positive people attending HIV care services was provided to 0.6 million people in 2007, up from 0.2 million in 2005 (FIGURE 2.10). This is a small fraction (2.2%) of the 33 million people estimated to be living with HIV. Of those in HIV care, almost 0.2 million were found to have TB, equivalent to 14% of the estimated 1.4 million incident HIV-positive TB cases globally. This high proportion suggests that if screening for TB increased beyond its currently low levels, TB case-finding would improve.

Provision of IPT continues to be extremely limited (FIGURE 2.10). Globally, less than 30 000 people were reported to have been started on IPT in 2007 – equivalent to just 0.1% of the 33 million people estimated to be infected with HIV. The low number of people being treated with IPT is inconsistent with the policies that have been established. While 100 countries reported the existence of an IPT policy, only 29 reported any provision of IPT in 2007 (although this was an increase from 26 countries in 2006).

Progress against Global Plan targets

The Global Plan details the progress required to implement collaborative TB/HIV activities for each year 2006–2015 within the framework of the goal of universal access to ART by 2010. The milestones or targets included for each year in the Global Plan provide a benchmark against which progress in practice can be assessed. A comparison of Global Plan expectations with implementation reported by countries in 2007 is shown in TABLE 2.9, for all regions combined and for the African Region. Among the 171 countries considered in the Global Plan, the absolute number of patients tested for HIV reached about half of the target in the Global Plan

BOX 2.5

Providing antiretroviral therapy (ART) to HIV-positive TB patients: access barriers limit progress

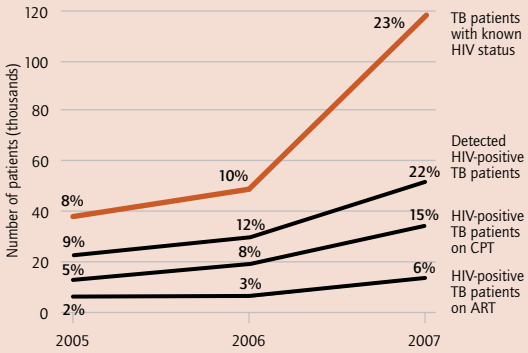
Data from eight countries (that account for 18% of the estimated global burden of HIV-positive TB cases) show that TB patients have poorer access to ART than to HIV testing. This may be a limiting factor in scaling up the provision of ART to HIV-positive TB patients and may result in unnecessary deaths.

The percentage of estimated HIV-positive TB cases identified by the NTPs of these eight countries increased substantially during 2005–2007, from 9% to 22%. This matched an increase in the proportion of notified TB cases with known HIV status, which rose from 8% to 23% (FIGURE). However, the number of patients placed on ART did not increase at the same pace. Compared with 2005, an additional 30 392 HIV-positive TB cases were identified in 2007 in the eight countries providing data, but only an additional 8261 patients were started on ART. This meant that an increasing number of diagnosed HIV-positive TB patients were not receiving ART.

In 2007, there was at least one HIV testing facility for every two health-care facilities where anti-TB treatment was available (TABLE). However, each ART facility was shared by five TB treatment facilities. HIV treatment services need to be decentralized and combined with TB services to improve access to ART for HIV-positive TB patients.

The provision of CPT is better. The proportion of diagnosed HIV-positive TB patients receiving CPT increased from 58% in 2005 to 65% in 2007, and CPT was provided to 15% of all estimated HIV-positive TB patients. Although data on the number of facilities providing CPT are not available, it is likely that CPT is more often available at TB clinics than ART.

HIV testing for TB patients, and provision of ART and CPT to HIV-positive TB patients, 8 countries,[a] 2005–2007. The numbers beside each point on the red line show the percentage of notified TB cases with known HIV status. The numbers on the other three lines show the percentage of total estimated HIV-positive TB cases accounted for by the patients detected and treated.



[a] Data shown are for the following 8 countries, which provided complete data for the years 2005–2007: Burkina Faso, DR Congo, Ethiopia, Malawi, Myanmar, Rwanda, Uganda and UR Tanzania.

Provision of TB treatment, HIV testing and counselling, and ART, 8 countries,[a] 2007

	NUMBER OF FACILITIES PROVIDING TB TREATMENT	NUMBER OF FACILITIES PROVIDING HIV TESTING AND COUNSELLING[b]	NUMBER OF FACILITIES PROVIDING ART[b]
Burkina Faso	462	454	76
DR Congo	1 205	286	209
Ethiopia	833	1 005	272
Malawi	551	504	163
Myanmar	324	291	32
Rwanda	450	312	165
Uganda	1 261	554	286
UR Tanzania	2 500	1 035	204
Total	**7 586**	**4 441**	**1 407**

[a] For comparison, this table shows the 8 countries included in the figure.

[b] Source: *Towards universal access: scaling up priority HIV/AIDS interventions in the health sector. Progress report 2008*. Geneva, World Health Organization, 2008.

FIGURE 2.10

Intensified TB case-finding and IPT provision among HIV-positive people, 2007. Numbers above bars show the proportion of estimated HIV-positive people screened for TB (graph a) and the proportion of HIV-positive people without TB started on IPT (graph b). Numbers under bars show the number of countries reporting data followed by the percentage of total estimated HIV-positive people (graph a) and HIV-positive people without active TB (graph b) accounted for by reporting countries.

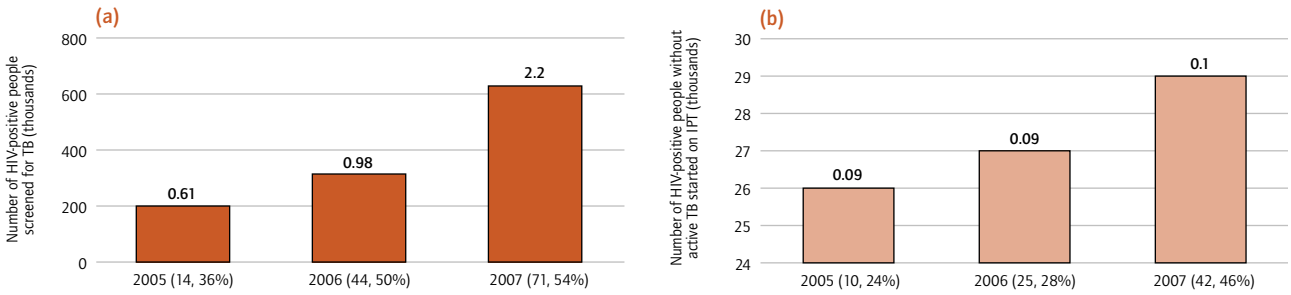
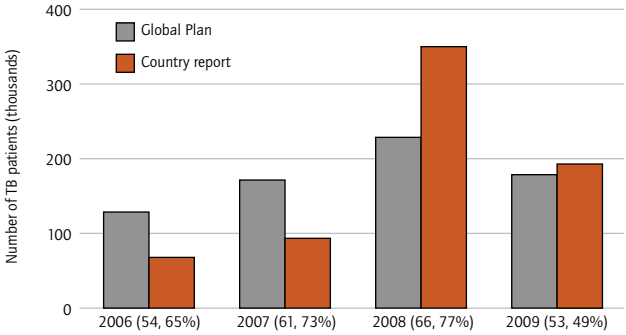


TABLE 2.9
Collaborative TB/HIV activities, 2007: country reports compared with expectations given in the Global Plan

	GLOBAL		AFRICA	
	COUNTRY REPORTS AND LATEST ESTIMATES[a]	GLOBAL PLAN	COUNTRY REPORTS AND LATEST ESTIMATES	GLOBAL PLAN
	(MILLIONS OR PERCENTAGES)		(MILLIONS OR PERCENTAGES)	
HIV-testing for TB patients, provision of CPT and ART				
Number of TB patients tested for HIV	0.9[b]	2.0	0.5[b]	0.9
Total number of notified TB cases including new, re-treatment and other cases	3.7[c]	3.5	1.3[c]	1.6
Proportion of all notified TB cases that were tested for HIV	27%[c,d]	56%	39%[c,d]	58%
Number of diagnosed HIV-positive TB cases enrolled on CPT	0.2	0.6	0.2	0.5
Number of diagnosed HIV-positive TB cases	0.3	1.1	0.3	0.9
Proportion of all HIV-positive TB cases enrolled on CPT	72%[e]	53%	76%[e]	56%
Number of diagnosed HIV-positive TB cases enrolled on ART	0.1	0.3	0.1	0.3
Number of diagnosed HIV-positive TB cases eligible for ART	0.3	0.5	0.3	0.4
Proportion of all HIV-positive TB cases enrolled on ART	34%[f]	53%	33%[f]	58%
Intensified TB case-finding and IPT for people with HIV				
Number of HIV-positive people attending HIV services screened for TB	0.6	14	0.3	13
Number of HIV-positive people attending HIV services	3.5	19	2.7	17
Proportion of HIV-positive people attending HIV services screened for TB	27%[g]	72%	21%[g]	76%
Number of eligible HIV-positive people offered IPT	0.03[h]	1.5	0.02[h]	1.4
Estimated number of HIV-positive people eligible for IPT	26	31	20	27
Proportion of estimated number of HIV-positive people eligible for IPT who received IPT	0.2%[i]	4.8%	0.1%[i]	5.0%

[a] Includes only those countries in the Global Plan, i.e. countries in sub-regions Central Europe and Established Market Economies are excluded here. Includes patients reported from DOTS and non-DOTS areas.
[b] Maximum number included for each country is the number of notified cases multiplied by the population coverage of collaborative TB/HIV activities anticipated by the Global Plan.
[c] Numbers of notified TB cases are weighted according to the population coverage of collaborative TB/HIV activities anticipated by the Global Plan.
[d] Only the 116 countries (33 in Africa) that provided both numerator and denominator are included in this percentage.
[e] Only the 58 countries (27 in Africa) that provided both numerator and denominator are included in this percentage.
[f] Only the 66 countries (22 in Africa) that provided both numerator and denominator are included in this percentage.
[g] Only the 62 countries (11 in Africa) that provided both numerator and denominator are included in this percentage.
[h] While the Global Plan includes only people newly diagnosed with HIV in this indicator, country reports include all HIV-positive people eligible for IPT, regardless of year of diagnosis.
[i] Only the 32 countries (8 in Africa) that provided the numerator are included in the denominator of this percentage.

FIGURE 2.11
Antiretroviral therapy for HIV-positive TB patients: country reports compared with the Global Plan, 2006–2009. Data from country reports are notified cases (2006–2007) and projections (2008–2009). The numbers under each bar represent the number of countries reporting data, followed by the percentage of total estimated HIV-positive TB cases accounted for by reporting countries.



in 2007, and provision of CPT and of ART both reached about one-third of the Global Plan targets. In terms of the percentage of TB cases found to be HIV-positive and who were enrolled on CPT, the comparison is much more favourable: for the world as a whole, 72% of TB cases in whom HIV infection was diagnosed were started on CPT in 2007 based on country reports, compared with the target of 53% for 2007 in the Global Plan. For ART, the figures were 34% and 53%, respectively. Findings were similar for the African Region specifically. The differences between the absolute numbers of people receiving CPT and ART in the Global Plan and country reports are mostly attributable to the shortfall in HIV testing. For patients to be treated with either CPT or ART, they must first be tested for and diagnosed with HIV. Among those found to be HIV-positive, lack of access to ART at local health facilities may also be a factor in the low uptake of ART (BOX 2.5).

For ART specifically among TB/HIV interventions, countries were requested to provide projections of the number of HIV-positive patients who would be started on ART in 2008 and 2009, as well as figures for the actual provision of ART in 2007. These data are compared with the Global Plan targets

TABLE 2.10
Number of MDR-TB cases estimated, notified and expected to be treated, 27 high MDR-TB burden countries and WHO regions

	ESTIMATED CASES, 2007			NOTIFIED		EXPECTED NUMBER OF MDR-TB CASES TO BE TREATED	
	% OF ALL TB CASES WITH MDR-TB	NUMBER OF MDR-TB CASES	NUMBER OF SS+ MDR-TB CASES	NUMBER OF MDR-TB CASES, 2007	% OF ESTIMATED SS+ MDR-TB CASES NOTIFIED, 2007	2008	2009
1 India	5.4	130 526	99 639	146	0.1	450	900
2 China	7.5	112 348	76 154	79	0.1	388	–
3 Russian Federation	21	42 969	31 397	5 297	17	4 221	9 897
4 South Africa	2.8	15 914	10 708	7 350	69	5 252	–
5 Bangladesh	4.0	14 506	7 694	–	–	150	–
6 Pakistan	4.3	13 218	7 939	–	–	250	250
7 Indonesia	2.3	12 209	6 427	–	–	100	250
8 Philippines	4.6	12 125	6 451	568	8.8	620	1 000
9 Nigeria	2.4	11 700	6 934	45	0.6	500	–
10 Kazakhstan	32	11 102	9 540	5568	58	1 562	4 266
11 Ukraine	19	9 835	5 568	–	–	–	–
12 Uzbekistan	24	9 450	6 936	484	7.0	334	720
13 DR Congo	2.8	7 336	4 137	82	2.0	523	756
14 Viet Nam	4.0	6 468	4 199	–	–	100	–
15 Ethiopia	1.9	5 979	3 086	145	4.7	45	200
16 Tajikistan	23	4 688	3 286	–	–	–	–
17 Myanmar	4.7	4 181	2 331	600	26	125	150
18 Azerbaijan	36	3 916	3 109	196	6.3	20	–
19 Republic of Moldova	29	2 231	1 656	896	54	466	490
20 Kyrgyzstan	17	1 290	813	322	40	–	–
21 Belarus	16	1 101	758	870	115	–	–
22 Georgia	13	728	590	269	46	280	540
23 Armenia	17	486	373	125	33	–	–
24 Lithuania	17	464	339	314	93	–	–
25 Bulgaria	12	371	217	82	38	50	50
26 Latvia	14	202	129	98	76	120	120
27 Estonia	20	123	85	80	94	120	100
High MDR-TB burden countries	**5.7**	**435 470**	**300 496**	**23 616**	**7.9**	**15 676**	**19 689**
AFR	2.4	75 657	45 029	8 841	20	9 337	4 070
AMR	3.2	10 214	7 261	2 522	35	3 670	4 046
EMR	3.8	23 049	14 120	487	3.4	966	707
EUR	17	92 554	67 440	16 062	24	8 414	17 457
SEAR	4.8	173 660	124 826	918	0.7	1 496	1 724
WPR	6.3	135 411	89 926	948	1.1	1 572	1 573
Global	**4.9**	**510 545**	**348 602**	**29 778**	**8.5**	**25 455**	**29 577**

– Indicates information not provided.

for ART in FIGURE 2.11. Among reporting countries, anticipated progress is encouraging, with projected numbers close to or above the Global Plan targets (note that the lower projection of patients to be treated in absolute terms in 2009 compared with 2008 is due to fewer countries reporting data for 2009).

Intensified case-finding and provision of IPT is far from Global Plan targets (TABLE 2.9). The target for 2007 was to screen 14 million HIV-positive people for TB; the actual figure reported was 0.6 million.

Overall, implementation of TB/HIV interventions falls short of the Global Plan targets, although data from individual countries show that these targets are achievable.

2.3.2 Diagnosis and treatment of MDR-TB

The most recent estimates suggest that, globally, there were 510 545 cases of MDR-TB in 2007. This estimate is based on data from drug resistance surveys or routine surveillance (DRS)[1] for 113 (new cases) and 102 (re-treatment cases) countries,[2] and statistical modelling for other countries (see ANNEX 2). Cases of MDR-TB are very unevenly distributed, with 27 countries (of which 15 are in Eastern Europe) accounting for 85% of all cases (TABLE 2.10). These 27 countries

[1] *WHO/IUATLD Global Project on Anti-tuberculosis Drug Resistance Surveillance*. Geneva, World Health Organization, 2008 (WHO/HTM/TB/2008.394).

[2] Full details are provided in The WHO/IUATLD Global Project on Anti-tuberculosis Drug Resistance Surveillance. *Anti-tuberculosis drug resistance in the world. Fourth global report*. Geneva, World Health Organization, 2008 (WHO/HTM/TB/2008.394).

FIGURE 2.12
Countries that had reported at least one case of XDR-TB by the end of 2008

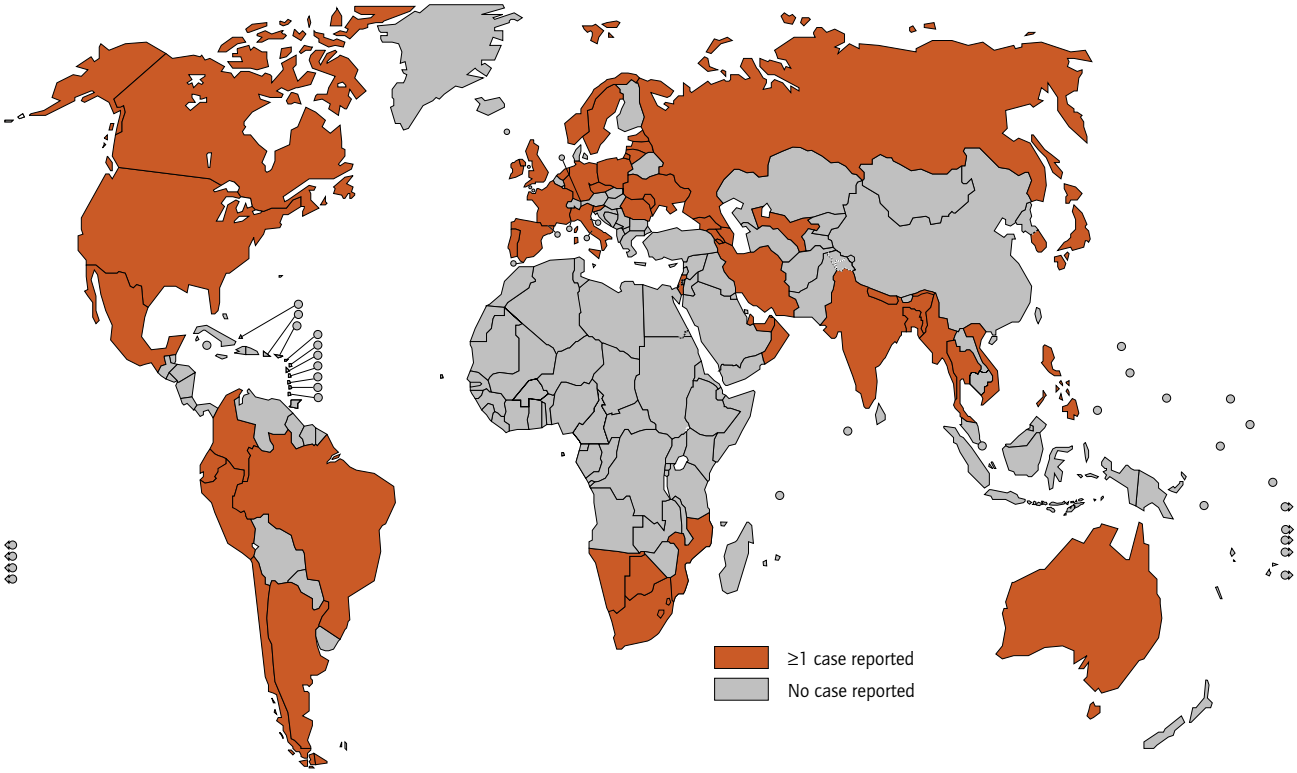
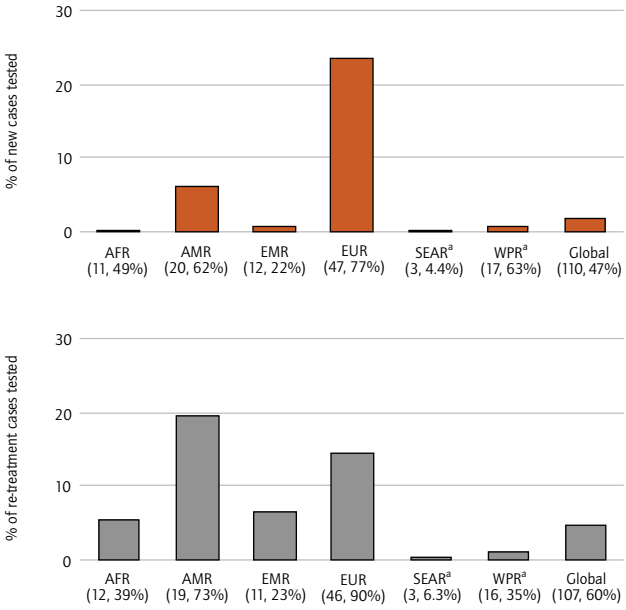


FIGURE 2.13
Diagnostic DST for new and re-treatment cases, by WHO region, 2007. The numbers under each bar show the number of countries reporting data, followed by the percentage of total estimated cases of MDR-TB accounted for by reporting countries.



[a] Data from India and China excluded as fewer than <0.1% of notified cases were tested.

have been identified as priorities for improved diagnosis and management of MDR-TB at the global level. By the end of 2008, 55 countries and territories had reported at least one case of XDR-TB (FIGURE 2.12), including five that reported cases for the first time in 2007 (Colombia, Oman, Qatar, the United Arab Emirates and Uzbekistan).

Diagnosis and notification

Diagnosis of MDR-TB requires DST services to be available and used (see also SECTION 2.2.3 above on Early case detection through quality-assured bacteriology). In 2007, 220 467 tests for drug susceptibility were reported by 122 countries, with 46% of these tests conducted in the European Region and 34% in the African Region (mostly for re-treatment cases in South Africa). Countries reporting DST data accounted for only 47% of the estimated total number of new cases of MDR-TB, and for 60% of the estimated total number of previously treated cases of MDR-TB (FIGURE 2.13). The proportion of new cases for whom DST was undertaken worldwide was 2%, although testing was much more common in the European Region (22% of new cases, with 45/53 countries reporting) (FIGURE 2.13). The proportion of re-treatment cases for whom DST was undertaken was higher (4.7% across all regions).

Among TB cases tested for drug susceptibility in 2007, 29 778 cases of MDR-TB were diagnosed and notified (TABLE 2.10; FIGURE 2.14); 54% of these cases were in Europe (TABLE 2.10). Although there is evidence that notifications are increasing (FIGURE 2.14), the number of MDR-TB cases

notified in 2007 represented only 6% of the 0.5 million cases estimated to exist worldwide (and 9% of estimated cases of smear-positive MDR-TB). This average conceals higher figures for several high MDR-TB burden countries: the number of notified cases was above 70% of the estimated number of cases in Belarus, Estonia, Kazakhstan and Lithuania and above one-third of estimated cases in Georgia, Latvia, the Republic of Moldova and South Africa. Globally, a small increase in provision of treatment for MDR-TB is anticipated between 2008 and 2009 (TABLE 2.10; FIGURE 2.14), including in India and the Russian Federation.

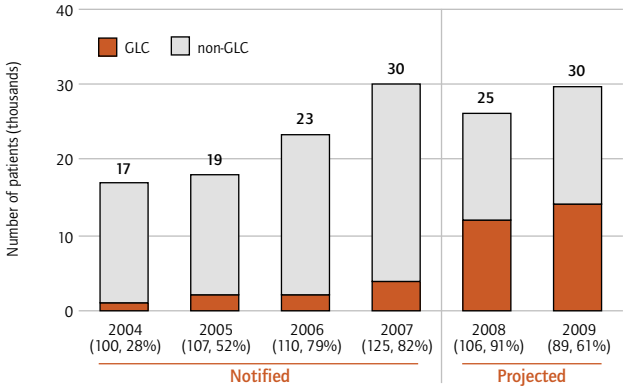
To date, most notifications have been from programmes and projects that were not affiliated to the Green Light Committee, or GLC (FIGURE 2.14). The GLC was established in 2000,[1] with the purpose of enhancing access to quality-assured second-line drugs at competitive prices and ensuring that treatment was provided according to WHO guidelines.[2] In 2007, the 3 681 patients who were treated in GLC-approved projects represented 0.7% of estimated MDR-TB cases. Current data indicate that this will increase to 14 136 patients in 2009 (FIGURE 2.14), or about 3% of estimated cases and 4% of estimated smear-positive cases of MDR-TB. Outside GLC-approved projects, it is not known how many notified cases are enrolled on treatment, and of these how many received treatment that is in line with WHO guidelines.

Scaling-up diagnosis and treatment

In recognition of the comparatively small share of the global burden of MDR-TB that is diagnosed and appropriately treated, the GLC has intensified its efforts to enable rapid expansion of MDR-TB diagnosis and treatment according to the latest WHO recommendations.[3] This includes building partnerships with major funding agencies (such as the Global Fund and UNITAID) and recent initiatives (such as the Global Laboratory Initiative and TBTEAM), and introducing mechanisms designed to speed up the review of applications. The result of these efforts was evident in 2008, when the annual number of reviewed applications was the highest to date. Among 43 applications that were reviewed, 39 projects were approved, including projects in 7 countries that had not previously benefited from GLC support (Belarus, Bulgaria, Cameroon, Ethiopia, Mozambique, the Republic of Serbia and the United Republic of Tanzania). These 39 projects will treat a cumulative total of about 20 000 MDR-TB patients during their lifetime, three times more than the total number of patients to be treated by projects approved in 2007. By the end of 2008, a total of 134 projects in 60 countries covering a cumulative total of approximately 50 000 patients had been approved by the GLC. Most of these countries were in the European Region (15 countries) and the Region of the Americas (14 countries), followed by the African Region (12 countries), the Western Pacific Region (7 countries), the Eastern Mediterranean Region (6 countries) and the South-East Asia Region (6 countries).[4] The number of patients enrolled for treatment in GLC projects is expected to increase more than three-fold in 2008 compared with 2007; GLC-approved

FIGURE 2.14

Notified cases of MDR-TB (2004–2007) and projected numbers of patients to be enrolled on treatment (2008–2009). The numbers under each bar show the number of countries reporting data, followed by the percentage of total estimated cases of MDR-TB accounted for by reporting countries.



treatments would then represent a larger share of the global number of MDR-TB patients on treatment (FIGURE 2.14).

An overview of the latest status of progress in introducing and scaling-up treatment of patients with MDR-TB, as reported by countries, is shown in TABLE 2.11. The most advanced of the 27 high MDR-TB burden countries appear to be Estonia, Georgia, Latvia, Kazakhstan and the Republic of Moldova, with all of the assessed components of MDR-TB management in place. The experience of Estonia and Latvia in managing MDR-TB within their NTPs is summarized in BOX 2.6. Among the remaining 27 high MDR-TB burden countries, all except South Africa have submitted an application to the GLC; national guidelines have been developed for the management of drug-resistant TB in 17 countries; and 20 countries have reported that they are scaling up activities. In Nigeria, Pakistan and Tajikistan, progress is limited to an application to the GLC or approval of a GLC project.

Treatment outcomes

Given that it takes 18–24 months to treat MDR-TB, in 2008 the WHO TB data collection form requested treatment outcome data for patients treated in 2004 and interim outcomes for patients started on treatment in 2005 and 2006. Annual MDR-TB cohorts were reported by 40, 53 and 65 countries for 2004, 2005 and 2006 respectively. As expected, in several countries with larger cohorts (such as the Democratic Republic of the Congo, Morocco and the Philippines), the proportion of cases started on treatment in 2006 who had not yet completed treatment was much higher than the proportion reported for patients who were started on treatment in 2004.

[1] http://www.who.int/tb/challenges/mdr/greenlightcommittee/en/

[2] *Guidelines for the programmatic management of drug-resistant tuberculosis.* Emergency update. Geneva, World Health Organization, 2008 (WHO/HTM/TB/2008.402).

[3] Data related to GLC operations were provided by the GLC secretariat, with the exception of projections for MDR-TB patients expected to be treated in 2008–2009, which were reported by countries via the annual WHO data collection form.

[4] Green Light Committee. *Annual Report 2007.* Geneva, Switzerland, 2008 (WHO/HTM/TB/2008.409).

TABLE 2.11
Management of drug-resistant TB, high MDR-TB burden countries and WHO regions, 2007

	DRUG RESISTANCE SURVEILLANCE CONDUCTED	APPLIED TO GLC	GLC-APPROVED PROJECTS PILOTED	NATIONAL GUIDELINES	TRAINING MATERIAL	TRAINING CONDUCTED	SCALING UP INITIATED	FULLY INTEGRATED INTO ACTIVITIES OF NTP	MDR-TB DATA REPORTED
1 India	Y	Y	Y	Y	Y	Y	Y	N	Y
2 China	Y	Y	Y	Y	Y	Y	Y	N	Y
3 Russian Federation	Y	Y	Y	N	Y	Y	Y	Y	Y
4 South Africa	Y	N	N	Y	Y	Y	Y	Y	Y
5 Bangladesh	N	Y	Y	Y	Y	Y	N	N	N
6 Pakistan	N	Y	Y	N	N	N	N	N	N
7 Indonesia	Y	Y	Y	Y	Y	N	Y	N	N
8 Philippines	Y	Y	Y	Y	Y	Y	Y	N	Y
9 Nigeria	N	Y	N	–	N	N	N	N	Y
10 Kazakhstan	Y	Y	Y	Y	Y	Y	Y	Y	Y
11 Ukraine	Y	Y	Y	N	–	–	Y	Y	N
12 Uzbekistan	Y	Y	Y	Y	Y	Y	Y	N	Y
13 DR Congo	Y	Y	Y	Y	Y	Y	Y	N	Y
14 Viet Nam	Y	Y	Y	–	–	–	–	–	N
15 Ethiopia	Y	Y	Y	Y	N	N	N	N	Y
16 Tajikistan	–	Y	N	N	N	N	N	N	N
17 Myanmar	Y	Y	Y	Y	Y	N	N	N	Y
18 Azerbaijan	Y	Y	Y	–	N	Y	Y	N	Y
19 Republic of Moldova	Y	Y	Y	Y	Y	Y	Y	Y	Y
20 Kyrgyzstan	N	Y	Y	N	Y	Y	Y	N	Y
21 Belarus	N	Y	Y	Y	Y	Y	Y	N	Y
22 Georgia	Y	Y	Y	Y	Y	Y	Y	Y	Y
23 Armenia	Y	Y	Y	N	N	Y	Y	N	Y
24 Lithuania	Y	Y	Y	Y	Y	Y	Y	N	Y
25 Bulgaria	N	Y	Y	N	N	N	Y	N	Y
26 Latvia	Y	Y	Y	Y	Y	Y	Y	Y	Y
27 Estonia	Y	Y	Y	Y	Y	Y	Y	Y	Y
High MDR-TB burden countries[a]	**20**	**26**	**24**	**17**	**18**	**18**	**20**	**8**	**21**
AFR (46)[b]	22	18	7	24	12	17	10	12	23
AMR (44)	21	14	14	25	20	23	17	13	25
EMR (22)	8	7	6	13	9	8	8	6	14
EUR (53)	33	17	13	24	20	21	28	22	45
SEAR (11)	6	8	6	9	7	5	7	3	5
WPR (36)	19	8	7	11	6	10	8	6	13
Global (212)	**109**	**72**	**53**	**106**	**74**	**84**	**78**	**62**	**125**

– Indicates information not provided.
[a] The lower part of table shows the number of countries answering "yes" to each question.
[b] The number of countries in each region is shown in parentheses.

The size of most country cohorts in 2004 was too small to allow any useful analysis (there were fewer than 40 cases in 26 countries, of which 13 had cohorts of fewer than 10 patients). The nine countries with cohorts of around 100 or more patients are shown in FIGURE 2.15. The highest treatment success rates have been achieved in the Philippines (73%) and Latvia (71%), both of which have GLC-approved projects, followed by the USA (61%). Treatment success rates ranged from 53% to 58% in Brazil and the Democratic Republic of the Congo, as well as in GLC projects in Peru and the Russian Federation. Outcomes were especially poor in two countries without GLC projects: Romania (38%, with a large proportion of patients dying or failing treatment) and Morocco (25%, with over half the cohort lost to follow up). To improve our understanding of treatment outcomes

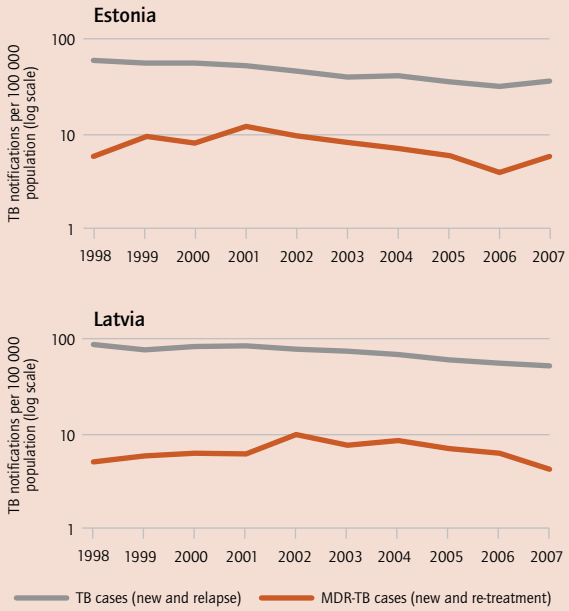
BOX 2.6

Controlling multidrug-resistant tuberculosis (MDR-TB) in Estonia and Latvia

A decade ago, Estonia and Latvia were considered to be the MDR-TB hotspots of the world, with the highest prevalence of MDR-TB among TB cases ever reported (23% and 13% in 1999, respectively). DOTS was initiated countrywide in Latvia in 1995 and in Estonia in 2000, in advance of other countries of the former Soviet Union. By 2006, the treatment success rate for new smear-positive cases was 68% in Estonia and 73% in Latvia. DOTS-Plus pilot programmes for the treatment of MDR-TB were launched in 1999 in Latvia and 2002 in Estonia, and were rapidly expanded to achieve nationwide coverage. These MDR-TB treatment programmes included provision of quality-assured drug susceptibility testing to all TB patients and use of molecular diagnostic tools for the rapid screening of MDR-TB. Infection control measures were implemented in in-patient and out-patient settings, including major renovation and upgrading of existing hospital wards. Out-patient treatment with patient support such as food packages and transport vouchers was made available during the continuation phase of treatment.

Despite struggling with social issues among TB patients, such as alcohol misuse and drug dependency as well as homelessness and increasing rates of coinfection with HIV, both countries have made significant progress in bringing TB and MDR-TB under control. Treatment success rates for the latest MDR-TB cohorts with complete data were 71% in Latvia (2005 cohort) and 54% in Estonia (2005). Between 2002 and 2007, the total number of MDR-TB cases per 100 000 population/year that were detected decreased by an average of 6% per year in Estonia and 14% in Latvia. Latvia opened the first WHO collaborating centre for MDR-TB management training. The example of these two countries as well as the collaborating centre provide important models for MDR-TB management elsewhere.

Notification rates of TB and MDR-TB, Estonia and Latvia, 1998–2007

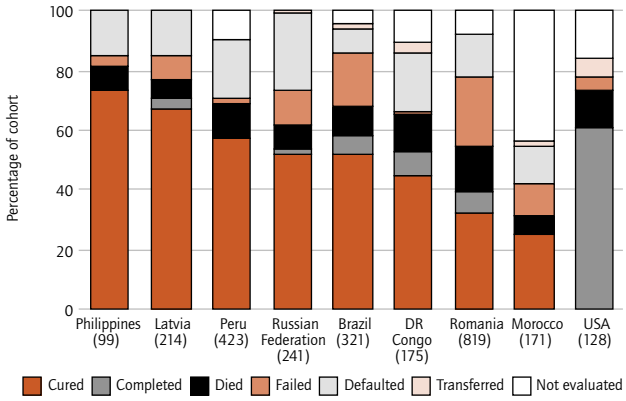


for patients with MDR-TB, more data from more countries, including data from GLC-approved projects and treatment provided outside the framework of the GLC, are needed.

Progress against Global Plan targets

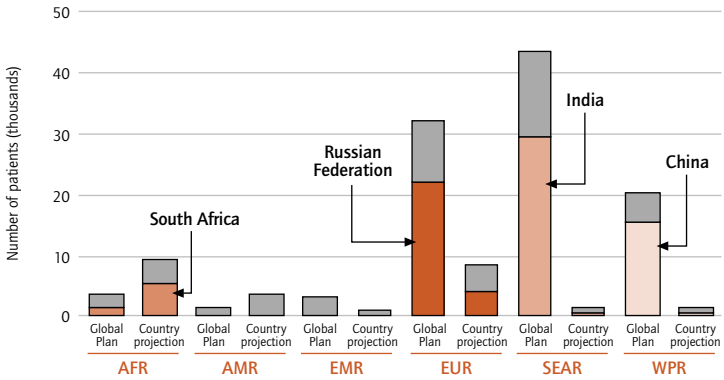
As with collaborative TB/HIV activities, the Global Plan sets out the progress required in provision of treatment for MDR-TB cases for each year 2006–2015. During 2007, the targets for the number of patients to be diagnosed and treated for MDR-TB were reviewed and revised to make the targets for 2010 comparable to the goal of universal access to ART by 2010.[1] The principal 2010 targets for MDR-TB are: (i) to offer diagnostic DST to all previously treated and chronic TB cases as well as to 90% of new TB cases with a high risk of having MDR-TB (for example, contacts of MDR-TB cases and those for whom treatment is failing after three months); and (ii) to enrol all those in whom MDR-TB is diagnosed in GLC-approved or equivalent treatment programmes. Despite the progress that has been made in some countries documented above, the number of MDR-TB patients notified in 2007 and country projections of the number of MDR-TB patients to be enrolled on treatment in 2008 and 2009 fall far behind the expectations of the Global Plan (TABLE 2.10; FIGURE 2.14; FIGURE 2.16). In 2008, the Global Plan recommended that

FIGURE 2.15
MDR-TB treatment outcomes in nine countries, 2004 cohort.
The number of patients in the cohort is shown under each bar. Countries ranked by cure rate.



[1] *The Global MDR-TB and XDR-TB response plan 2007–2008*. Geneva, World Health Organization, 2007 (WHO/HTM/STB/2007.387).

■ **FIGURE 2.16**
Country projections of MDR/XDR-TB patients to be enrolled on treatment in 2008 compared with the Global Plan



around 100 000 MDR-TB patients (including 10000 patients with XDR-TB) should be enrolled on treatment, which is more than three times higher than notifications (for 2007) or country projections (for 2008 and 2009).

Differences between Global Plan expectations for 2008 and country projections vary by region, as shown in FIGURE 2.16. In particular, targets set in the Global Plan are far above country projections in the three regions with the highest number of MDR-TB cases: the European Region, the South-East Asia Region (principally India) and the Western Pacific Region (where most cases are in China). In the African Region and the Region of the Americas, projections of the number of patients treated for MDR-TB treatment are ahead of Global Plan targets.

The relatively small numbers of MDR-TB cases diagnosed and treated to date, the modest projections of the patients to be treated in the near future and the fact that only 25% of countries have reported XDR-TB all demonstrate how much work remains to be done to improve the availability and provision of diagnosis and treatment for MDR-TB and XDR-TB. A ministerial meeting on MDR-TB and XDR-TB to be held in Beijing in April 2009, with representation from all 27 high MDR-TB burden countries, will provide a foundation for global efforts to accelerate provision of diagnosis and treatment for MDR-TB from 2009 onwards.

2.3.3 Poor and vulnerable populations

Although routine investigation of close contacts of TB patients is known to help early case detection, TB contact investigation is not yet a routine activity of TB control programmes in most countries. A total of 82 countries reported that TB contact investigation activities were implemented; among these, 63 reported that a total of 1.4 million contacts had been screened, of whom 3.8% (53 981) had active TB. The remaining 19 countries reported either on the number of contacts screened or the number of TB cases diagnosed among contacts, but not both.

Among the 176 countries and territories addressing TB in high-risk groups, 57 (32%) including seven HBCs were providing TB care to refugees and displaced people in 2007. Adaptation of TB control services to meet the needs of migrant workers and cross-border populations was reported by 47 (27%) and 35 (20.0%) countries, respectively (including seven HBCs). About one fifth of countries stated that special attention was given to providing TB care among the homeless, slum dwellers, minorities, drug dependent individuals and people living with diabetes.

Routine screening for TB among immigrants is undertaken in 36 countries (20%), including two HBCs. In 154 countries (88%) including 20 HBCs, no differentiation is made between the provision of TB care for immigrants and non-immigrants. However, in other settings, immigrants with TB have either to pay for their TB treatment (four countries) or be repatriated (12 countries). The repatriation may be immediately on diagnosis of TB (two countries) or after the initial phase of treatment (10 countries).

Despite complex emergency situations, TB care continues to be provided in Afghanistan, Iraq, Somalia and Sudan, thanks to close collaboration and coordination among various partners. TB services that were temporarily disrupted in areas heavily affected by the typhoon Nargis in Myanmar were restored swiftly, under the leadership of the NTP.

2.4 Contribute to health system strengthening based on primary health care

Achieving all the health-related MDGs requires strengthening of health systems. In the past 2–3 years, greater emphasis has been placed on such strengthening at national and international levels. A prominent example is the International Health Partnership (IHP+)[1] established in September 2007, which aims to accelerate the scale-up of health services to achieve the health-related MDG and universal access targets via the development and implementation of "country compacts". These country compacts commit development partners to predictable funding for national plans that are both results-oriented and address health system constraints. By the end of 2008, 10 countries had been fully inaugurated as IHP+ countries: Burundi, Cambodia, Ethiopia, Kenya, Madagascar, Mali, Mozambique, Nepal, Nigeria and Zambia.[2] A second example is the renewed commitment of WHO as well as its Member States and partners to primary health care (PHC) in 2008, 30 years on from the original launch of PHC as a means to achieve the goal of "health-for-all".

There are various ways to monitor how NTPs and their partners are contributing to health system strengthening. This section discusses the topics on which data were available from the 2008 data collection form.

2.4.1 Integration in primary health care

Diagnosis and treatment of TB are integrated fully into PHC services in almost all countries. Twenty HBCs (and 83% of

[1] The "+" in the title recognizes that there are number of other partnerships addressing system strengthening elements.
[2] http://www.internationalhealthpartnership.net

all countries) reported that TB control services were delivered through PHC facilities. Similarly, laboratory services for diagnosis of TB are usually integrated into general laboratory services: 86% of laboratories performing sputum smear microscopy in HBCs (80% across all countries) are general laboratories. Procurement, distribution and stock management of anti-TB drugs are undertaken together with other essential drugs management in 10 HBCs and in 64% (110/173) of all reporting countries.

2.4.2 Alignment with broader planning and financing frameworks

A high proportion of HBCs reported alignment of NTP plans and budgets with broader planning and financing frameworks (FIGURE 2.17). Contributing to health-system strengthening is an explicit component of the national strategic plan for TB control in 19 HBCs. However, there appears to be more scope for NTPs to involve the full range of stakeholders in planning and strategy development (FIGURE 2.18).

2.4.3 Human resource development

A comprehensive strategic plan for human resource development (HRD) should ensure both financing and guidance for an adequate, competent and performing workforce for TB control, integrated within overall health workforce plans and strategies. Plans should be based on a recent needs assessment and include: (i) a clear vision and goal, and associated objectives and strategies; (ii) definition of training and staffing needs for all components of the Stop TB Strategy; (iii) up-to-date job descriptions; (iv) provision for updating of the TB training curricula of various health cadres where appropriate; (v) ongoing training for existing staff at all levels of the health system; and (vi) systematic supervision and monitoring of recruitment and training needs.

A total of 94 countries including 14 HBCs have conducted a recent needs assessment, and 90 countries including 14 HBCs have a comprehensive plan for HRD for TB control (TABLE 2.12). Six countries that reported having a plan had not conducted any needs assessment. Among the HRD plans that do exist, most could be strengthened. For example, only seven HBCs have considered training and staffing needs for all the major components of the Stop TB Strategy.

Job descriptions of staff involved in the implementation of the Stop TB strategy were up-to-date in 120 countries, including 19 HBCs. Among the 22 HBCs, 18 had a designated person for HRD at the central level of the NTP. However, a full-time member of staff was available in only six countries: Afghanistan, Nigeria, Pakistan, the Russian Federation, South Africa and the United Republic of Tanzania.

Information regarding staff positions, vacancies and the training status of staff is essential for HRD, but routine monitoring of staff availability, turnover and training appears weak across HBCs. Only 9 HBCs provided at least some information about the availability of staff trained in TB control at health care facilities. In all but two countries, the information was incomplete or contradictory.

FIGURE 2.17
Alignment of NTP plans and budgets with other planning frameworks and initiatives, high-burden countries, 2007

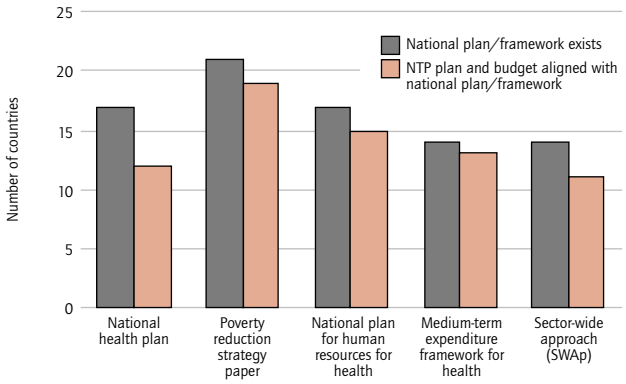
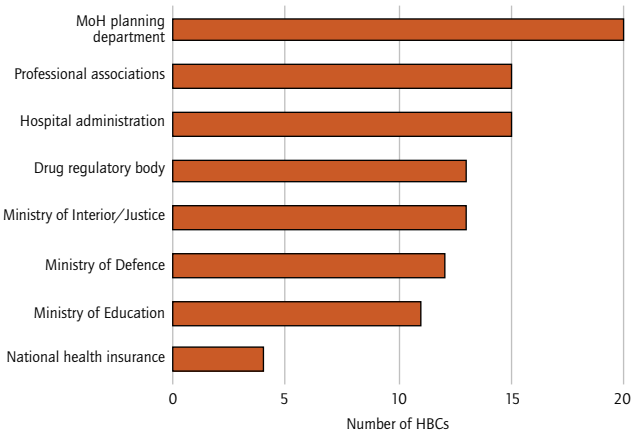


FIGURE 2.18
Involvement of different stakeholders in the development of national TB control strategies and plans



Training related to TB control is included in the basic curriculum of doctors, nurses and laboratory technicians in 141, 133 and 135 countries, respectively (including 18, 16 and 18 HBCs). Nonetheless, monitoring missions to HBCs have shown that the work on updating basic curricula is often not formalized.

Compared with data reported in 2007, data reported in 2008 suggest only modest improvements in HRD. Reporting weaknesses including inconclusive, contradictory and incomplete data. The main conclusion based on these data remains the same as last year: major strengthening of HRD for TB control is urgently needed in many countries in all regions, especially in HBCs.

2.4.4 Infection control

Infection control is a combination of measures aimed at minimizing the risk of TB transmission through early identification of individuals with suspected and known TB, and proper management of these people. Infection control for TB includes organizational, administrative, environmental and personal protective controls, each of which needs to be implemented using a patient-centred approach that minimizes the risk of stigma for TB patients and TB suspects. The importance of

TABLE 2.12
Human resource development (HRD) for TB control, 2007

	HRD NEEDS ASSESS-MENT	COMPRE-HENSIVE STRATEGIC HRD PLAN	HRD PLAN INCLUDES TRAINING NEEDS IN					HRD PLAN INCLUDES STAFFING NEEDS IN					
			DOTS	MANAGE-MENT OF MDR-TB	COLLABO-RATIVE TB/HIV ACTIVITIES	PUBLIC–PUBLIC MIX APPROACHES (PPM)	ACSM	DOTS	MANAGE-MENT OF MDR-TB	COLLABO-RATIVE TB/HIV ACTIVITIES	PUBLIC–PUBLIC MIX APPROACHES (PPM)	ACSM	JOB DESCRIPTIONS UP TO DATE
1 India	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	All
2 China	Y	N	–	–	–	–	–	–	–	–	–	–	None
3 Indonesia	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	–
4 Nigeria	N	Y	Y	Y	Y	Y	Y	N	N	N	N	N	All
5 South Africa	Y	N	–	–	–	–	–	–	–	–	–	–	All
6 Bangladesh	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	All
7 Ethiopia	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	–
8 Pakistan	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Some
9 Philippines	N	Y	Y	Y	Y	Y	Y	N	N	N	N	N	–
10 DR Congo	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	–
11 Russian Federation	N	N	–	–	–	–	–	–	–	–	–	–	None
12 Viet Nam	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	–
13 Kenya	Y	N	–	–	–	–	–	–	–	–	–	–	All
14 Brazil	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	–
15 UR Tanzania	N	Y	–	–	–	–	–	–	–	–	–	–	–
16 Uganda	N	N	–	–	–	–	–	–	–	–	–	–	All
17 Zimbabwe	Y	N	–	–	–	–	–	–	–	–	–	–	All
18 Thailand	Y	Y	Y	–	Y	–	–	Y	–	Y	–	–	–
19 Mozambique	Y	N	–	–	–	–	–	–	–	–	–	–	All
20 Myanmar	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	All
21 Cambodia	Y	N	–	–	–	–	–	–	–	–	–	–	–
22 Afghanistan	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	–
High-burden countries[a]	**14**	**14**	**13**	**11**	**13**	**11**	**12**	**11**	**9**	**10**	**8**	**8**	**19**
AFR (46)[b]	17	18	17	17	16	15	17	16	15	12	12	12	24
AMR (44)	19	18	19	19	19	17	18	16	15	16	15	16	21
EMR (22)	16	18	19	15	14	16	18	19	15	14	16	17	16
EUR (53)	16	13	14	15	14	10	15	13	13	13	9	12	24
SEAR (11)	8	10	10	9	10	7	8	9	8	9	7	7	10
WPR (36)	18	13	13	13	13	10	12	10	10	9	6	8	25
Global (212)	**94**	**90**	**92**	**88**	**86**	**75**	**88**	**83**	**76**	**73**	**65**	**72**	**120**

– Indicates not applicable (no plan, or activity not implemented).
[a] Lower part of table shows the number of countries with affirmative answer (for last column, the number of countries where all or almost all job descriptions were up to date).
[b] The number of countries in each region is shown in parentheses.

implementing these measures has been highlighted by the transmission of MDR/XDR-TB in settings where HIV care is provided. Updated WHO policy guidance on controlling TB infection in health-care and congregate settings as well as within households is now available.

Measures to control infection need to be implemented throughout the health system. While some measures are TB-specific, others are relevant to all infectious diseases. Infection control also requires a multi-disciplinary team (comprising, for example, health staff as well as building surveyors and architects), and interventions to improve TB control can improve collaboration across these disciplines.

Data reported in 2008 suggest that infection control is at an early stage of development in most countries and that better indicators are needed to monitor implementation. No country provided data about actual implementation of interventions, although 75% (131/175) of countries had a policy on TB infection control in hospitals in 2007. The number of countries that reported the existence of a policy on TB infection control in clinics, prisons and military barracks was 114, 94 and 69 respectively.

2.4.5 Practical Approach to Lung Health

The Practical Approach to Lung Health (PAL) is a patient-centred approach to improving the quality of diagnosis and treatment for common respiratory illnesses in primary health-care facilities. It is designed to ensure a consistent approach to diagnosis and treatment at different levels of the health-care system, efficient use of resources (for example, by ensuring that care is provided at the most appropriate level of the health system and that drugs are used rationally), and coordination among TB control services and other health-care services. Implementation requires adaptation of guidelines according to existing national health policies and available

resources. At the end of 2008, 70 countries including nine HBCs had a plan to initiate PAL. Nine countries were piloting PAL and 11 were in the process of expanding it beyond pilot sites (including one HBC, South Africa). National guidelines for PAL were available or in preparation in 21 countries. PAL implementation is totally or partially funded by the Global Fund in 19 countries, including three HBCs.

2.5 Engage all care providers

2.5.1 Public–private mix approaches

Besides the network of health facilities directly within the jurisdiction of the NTP, diagnosis and treatment of TB are provided by a wide array of public, voluntary, corporate and private providers in many countries. Partnerships with these providers are essential to ensure delivery of TB services that are in line with international standards and to achieve global targets (notably the target for case detection). The Stop TB Strategy envisages that NTPs will engage all relevant care providers for TB care and control through PPM approaches.

In 2008, all countries were asked to provide information about the number of different types of providers[1] that had been engaged formally in TB control and the number of new TB cases referred and treated by major categories of public and private providers involved in PPM initiatives. Unfortunately, while most countries have begun implementing PPM-related activities, data were usually too incomplete to make an accurate assessment of the contribution of PPM to case detection and treatment. This suggests that very few countries are using the revised recording and reporting forms recommended by WHO, which are designed to allow disaggregated analysis of referrals and treatment by category of provider (at a minimum on an annual basis from selected facilities). By 2007, only nine HBCs had started systematically to record the source of referral of patients and where they were receiving treatment, and a smaller number were extracting data from these records in a systematic way. The best example of a country that was able to report data was the Philippines, where PPM initiatives that have been implemented in 40% of the country account for 9% of national notifications (ANNEX 1). It is also evident that PPM initiatives are capable of making a major contribution to notifications in Pakistan (BOX 2.7), although here results are from a special study rather than routinely reported data.

In the absence of precise data, countries were also asked to assess the contribution of different providers to referral and treatment by stating whether all, some or no providers in a given category were contributing to diagnosis and treatment. Almost half of the HBCs have managed to involve all health institutions belonging to the public sector health-care network, such as public hospitals, medical college hospitals, army health facilities and prison health facilities. Facilities

[1] Private providers were categorized as private hospitals, private practitioners, NGO/mission clinics and hospitals, corporate (business) health services and private medical college hospitals. Public providers were categorized as general public hospitals, public medical college hospitals, health/social insurance services, prison/detention centres and military facilities.

BOX 2.7

Forging public–private partnerships (PPP) for TB care and control in Pakistan

Pakistan's large and diverse private health sector (both profit and not-for-profit) is extensively used by TB patients. In recent years, successive NTP managers have given high priority to developing viable partnerships with health-care providers in this sector by using a systematic approach that is consistent with the steps recommended in WHO guidelines.[1] Introducing PPM began with a situational analysis that was used to design a range of PPM models suitable for the following types of provider: NGO clinics with and without laboratories; individual general practitioners; general practitioners who are grouped in clusters or linked to NGOs involved in social franchising; private clinics and hospitals; and informal providers (including both those who practise conventional medicine and those who do not). Developing national operational guidelines as a foundation for countrywide implementation was followed by establishing and funding staff positions specifically for PPM at national, provincial and district levels. The government also made a strong financial commitment, with 39% of the domestic funding available for TB control allocated to PPM in the 2005–2010 development plan.

The operational guidelines provide practical advice on several key topics, including the role of agreements with decision makers at district level; creation and maintenance of PPP coordination committees at provincial and district levels (with similar functions to those of the national steering committee); identification and selection of private partners; the value of a memorandum of understanding and how to develop one; training and certification of providers; monitoring and supervision; recording and reporting; and how to ensure that the general public is properly informed.

Many partners are now contributing to TB control via PPP schemes, and evidence of their contribution to case detection is emerging. A WHO-assisted mission conducted in 2008 found that in 2007, PPM initiatives accounted for almost 20% of total notifications (39 635) and just over 20% of notifications of new smear-positive cases (20 129). The table below presents data from three provinces that together had 90% of all registered TB patients in 2007. In the three provinces combined, 51% of all cases detected by non-NTP providers were new sputum smear positive cases while among those detected in the public sector, 36% were new sputum smear-positive cases.

PROVINCE OR CITY	NUMBER OF TB CASES NOTIFIED IN 2007			NUMBER OF NEW SMEAR-POSITIVE TB CASES NOTIFIED IN 2007		
	TOTAL	PPP	% OF NOTIFICATIONS FROM PPP	TOTAL	PPP	% OF NOTIFICATIONS FROM PPP
North West Frontier	30 699	5 485	18%	11 886	1 961	16%
Sindh (excluding Karachi City)	30 798	1 943	6%	14 718	147	1%
Karachi City	14 887	7 531	51%	6 882	3 625	53%
Punjab	131 742	24 676	19%	47 926	14 396	30%

[1] *Engaging all care providers in TB control. Guidance on implementing public-private mix approaches*. Geneva, World Health Organization, 2006 (WHO/HTM/TB/2006.360).

operated by health insurance agencies were fully engaged with NTP in about one third of the HBCs. Most HBCs have also started to involve at least some private practitioners, private hospitals and NGO health facilities in referral to the NTP, diagnosis according to programme guidelines and/or treatment with anti-TB drugs supplied by the NTP. More countries reported that all of these providers were engaged in national TB control in 2008 compared with 2007.

Several HBCs including Bangladesh, China, India, Indonesia, Kenya, the United Republic of Tanzania, Pakistan and the Philippines have used context-specific, innovative and NTP-led approaches to engage diverse care providers in TB control.

2.5.2 International Standards for Tuberculosis Care

Launched on World TB Day in 2006, the International Standards for Tuberculosis Care[1] provide an excellent basis for standardizing management practices across providers of TB care and are also an effective tool for advocating scale up of PPM implementation. A suggested initial step towards their application is to have the standards endorsed by relevant associations of health professionals. This step has been carried out by at least one professional association in about a quarter of reporting countries including 13 HBCs. One third of all reporting countries were using the standards to promote the engagement of non-NTP care providers. A higher proportion of reporting countries (about 50%, including 14 HBCs) have incorporated the standards into the curricula of medical schools; about 40% of countries (including 13 HBCs) have integrated them into NTP training material.

2.6 Empower people with TB, and communities through partnership

2.6.1 Advocacy, communication and social mobilization

An ACSM strategy involves three distinct sets of activities: advocacy aimed at influencing leaders or decision-makers, communication channelled to individuals and small groups, and social mobilization to empower and secure support for efforts in TB control from civil society and the community as a whole.

All HBCs report implementing ACSM activities that target the general public, TB suspects and patients, health-care providers and policy-makers. However, it is unclear from country reports whether the ACSM activities are a part of a strategic ACSM plan that supports the goals of the NTP; it is also unclear whether the impact of ACSM activities is being evaluated.

Strategic planning of ACSM should begin with a survey of knowledge, attitudes and practices to identify the challenges to be addressed and the audiences to which ACSM activities need to be targeted. It also allows programmes to establish baseline indicators so that progress can be monitored and impact evaluated. It is encouraging that 16 HBCs have conducted or have plans to conduct such a survey (see ANNEX 1).

Only seven HBCs reported involving patient-centred organizations or networks in advocacy activities and/or DOTS implementation. Forging partnerships with other organizations and networks that have expertise in the area of ACSM is an important strategy that can help to address the generally limited capacity of NTPs in this technical area.

2.6.2 Community participation in TB care

Community and patient empowerment are central to a human rights approach to care of TB patients and prevention of the disease. In addition, country experience shows that activities that foster community and patient empowerment can have a positive impact on case detection and treatment outcomes. Unfortunately, the available data do not shed much light on the activities that are being implemented at local level, although some descriptions are provided in ANNEX 1. Eight HBCs reported on the number of basic management units in the country that involved community members as treatment supporters, and only two HBCs reported data about the number of patients who were referred by general members of the community for TB screening or who were cared for in the community during treatment. The scarcity of information on the scope and nature of community involvement within countries indicates the need for greater emphasis and related guidance on this important aspect of TB care and control.

2.6.3 Patients' Charter for Tuberculosis Care

Launched alongside the International Standards for Tuberculosis Care, the Patients' Charter for Tuberculosis Care[2] outlines the rights and responsibilities of TB patients. An essential first step for many countries is translation of the charter into local languages. Many countries are also likely to require some guidance on the most effective way to use the charter; to date, information about its actual use is limited (see also ANNEX 1).

2.7 Enable and promote research

To help pilot, evaluate and scale up the various components and sub-components of the Stop TB Strategy, an increasing number of countries appear to be recognizing the importance of programme-based operational research. A total of 89 countries including 20 HBCs reported that research activities related to TB control were implemented in 2007, up from 49 countries in 2006. Among these countries, almost 400 research projects were reported. Four HBCs (Bangladesh, China, India and the Russian Federation) as well as Mexico listed more than 20 research topics that were being addressed. These topics were related to the basic elements of DOTS components (49 countries), collaborative TB/HIV activities (39 countries), MDR-TB and XDR-TB (39 countries), PAL (10 countries), and social mobilization and community

[1] *International standards for tuberculosis care: diagnosis, treatment, public health.* The Hague, Tuberculosis Coalition for Technical Assistance, 2006.

[2] *The Patients' charter for tuberculosis care: patients' rights and responsibilities.* World Care Council, 2006.

involvement (22 countries). Research on tobacco and diabetes as risk factors for TB, retooling (the introduction of new technologies) and evaluation or feasibility studies related to new technologies was also reported. Fifteen countries implemented surveys of anti-TB drug resistance in 2007. A literature search showed that papers related to TB were published from all but one HBC.

Information from the Stop TB Partnership's three working groups on the development of new tools for TB control also shows that over 100 sites are involved in clinical trials to develop new diagnostics, drugs and vaccines. Most of these sites are in countries where TB is endemic. Eleven countries have provided reports about their experience with the development and introduction of new diagnostics. With several potential new tools moving from the stage of discovery to clinical trials, increasing participation of countries in the evaluation of these tools is required.

2.8 Summary

Progress in implementing the Stop TB Strategy varies across components and among countries. The first component and foundation of the strategy – DOTS – is the most widely implemented. It is also the component for which progress is closest to matching the expectations contained in the Global Plan: the global case detection rate was 63% in 2007 and the treatment success rate 85% in 2006. Nonetheless, urgent improvements in the provision of services for laboratory culture and DST are needed in many countries, and there are countries that continue to report stock-outs of first-line drugs.

Besides DOTS implementation, diagnosis and treatment of MDR-TB and collaborative TB/HIV activities (both under component 2) are the other major parts of the Stop TB Strategy for which implementation can best be quantified. There is clear evidence of progress in implementing interventions such as HIV testing of TB patients and provision of CPT and ART to HIV-positive TB patients, particularly in the African Region. In 2007, 37% of TB patients in the African Region knew their HIV status, 0.2 million HIV-positive TB patients were enrolled on CPT and 0.1 million HIV-positive TB patients were started on ART; in each case, figures were higher than those reported in previous years. Nonetheless, the numbers of HIV-positive TB patients accessing services for provision of CPT and ART remain small compared with the estimated 1.4 million HIV-positive TB cases. Collaborative TB/HIV activities need to be scaled up to ensure that many more people know their HIV status and many more HIV-positive people, with and without TB, have access to appropriate treatment and care.

Progress in diagnosing MDR-TB and treating patients with the disease is mostly confined to the European Region and South Africa. Globally, just under 30 000 cases of MDR-TB were notified to WHO in 2007, or 8.5% of the estimated global total of smear-positive cases of MDR-TB. Of these notified cases, 3681 were started on treatment in projects or programmes affiliated to the GLC (and are thus known to be providing treatment according to international guidelines), which represents only 1% of the smear-positive cases of MDR-TB estimated to exist globally. Although the number of patients started on treatment is expected to increase to around 14 000 in 2009, this still represents only 4% of the smear-positive cases of MDR-TB estimated to exist globally. To meet the targets set in the Global Plan, diagnosis and treatment need to be rapidly expanded, especially in China, India and the Russian Federation.

The extent to which components 3–6 of the Stop TB Strategy are being implemented is less well understood, because to date progress is more difficult to quantify. The integration of diagnosis and treatment of TB into primary health care in almost all countries as well as reported alignment with broader health sector planning frameworks and expansion of PAL (all part of component 3) are encouraging. However, considerable work on HRD and infection control is needed in many countries in all regions. PPM and the ISTC (component 4) are being introduced and expanded in an increasing number of countries, and examples from specific countries such as Pakistan and the Philippines demonstrate the potential of PPM to contribute to increased case detection. In order to better understand the relative contribution of different providers to the detection, referral and treatment of cases requires much greater use of routine recording and reporting forms that allow disaggregated analysis for different categories of provider. ACSM (component 5) is still a new area for many countries. Much more guidance and technical support are necessary to ensure that interventions are appropriately designed and evaluated. Finally, while operational research and the introduction of new tools (both part of component 6) are occurring, the information available for this report was comparatively limited.

This chapter concludes that there is a need in most countries for major scaling up of the interventions and approaches included in the Stop TB Strategy. For this to be feasible, increased funding is required. Financing is the topic of the next chapter.

CHAPTER 3

Financing

Implementing the Stop TB Strategy at the scale required to achieve the 2015 targets for global TB control (see also CHAPTER 1 and CHAPTER 2) requires accurate budgeting of the financial resources required, mobilization of the necessary funding and spending of available funds such that TB control outcomes are improved. Analysis of budgets and funding for TB control was introduced into the annual WHO report on global TB control in 2002, and expenditures have been reported on since 2004.

This chapter provides WHO's latest analysis of financing of TB control. As with the previous two chapters, emphasis is placed on 22 high-burden countries (HBCs), but analyses for all countries reporting financial data are also included. The chapter is structured in eight major sections. The first section summarizes the data that were reported to WHO in 2008. The next six sections present the budgets of national TB control programmes (NTPs) from 2002 to 2009 and the sources of funding and funding gaps for these budgets; the total costs of TB control (including the cost of resources that are used within the general health system as well as the costs included in NTP budgets), also for 2002–2009; comparisons of funding requirements reported by countries with estimated funding requirements that were contained in the Global Plan to Stop TB, for the period 2006–2009; per patient costs and budgets in 2009; a comparison of expenditures with available funding and with changes in the number of cases that have been detected and treated; and the contribution of the Global Fund to financing for TB control. The eighth section discusses why funding gaps persist and the possible consequences of the global financial crisis for TB control.

Further details are also provided in ANNEX 1 and ANNEX 3.

3.1 Data reported to WHO in 2008

WHO received financial data from 158 out of 212 (75%) countries and territories in 2008, similar to the number that reported data in 2007.[1] Complete budget data for 2009 were provided by 102 countries (FIGURE 3.1), 98 countries provided complete budget data for 2008 and 92 countries provided complete expenditure data for 2007. Overall, countries reporting financial data accounted for 98% of the global burden of TB. The countries that provided financial reports accounted for 97% or more of the regional burden of TB in five WHO regions, with a lower figure of 83% for the European Region. This is the most complete reporting of financial data to WHO since financial monitoring began in 2002.

Complete budget data for 2009 were reported by all HBCs except South Africa (FIGURE 3.1). Of particular note is Thailand, which provided complete budget data for the first time in five years following a comprehensive planning and budgeting effort that was facilitated by use of the WHO planning and budgeting tool (BOX 3.1).[2] Expenditure data for 2007 were reported by all HBCs except South Africa and Uganda (data not shown).

Considerable clarification and verification of financial data by WHO are still required, but the quality of the data when first submitted continues to improve. In 2008, this was notable for the African Region, the Region of the Americas and the South-East Asia Region. Improvements were probably facilitated by related work on planning and budgeting undertaken with 35 African countries in 2007 and with nine countries from the South-East Asia Region in 2008, as well as close collaboration with countries in the Region of the Americas during regional meetings.

3.2 NTP budgets, available funding and funding gaps

3.2.1 High-burden countries

NTP budgets in the 22 HBCs amount to US$ 2.5 billion in 2009, almost three times their level in 2002 (TABLE 3.1; FIGURE 3.2; FIGURE 3.3). The Russian Federation has the highest budget (US$ 1.2 billion), followed by South Africa (US$ 352 million), China (US$ 225 million), India (US$ 100 million) and Brazil (US$ 64 million). These five countries account for 80% of the NTP budgets reported for 2009 by the 22 HBCs. The eight HBCs in the African Region (excluding South Africa) had a combined budget of US$ 225 million in 2009, only 10% of the total for all 22 HBCs.

Much of the increase in NTP budgets since 2007 is explained by an increase in the budget for MDR-TB (FIGURE 3.2), almost all of which (US$ 372 million, or 88% of a total of US$ 422 million) is accounted for by the Russian Federation and South Africa (ANNEX 1). Nonetheless, NTP budgets increased in most HBCs between 2007 and 2009, and NTP budgets have increased substantially in all HBCs except Viet Nam since 2002 (FIGURE 3.4; ANNEX 1).

In 2002–2006, activities to support the DOTS component of the Stop TB Strategy accounted for the largest proportion of NTP budgets (FIGURE 3.2). However, budgets for collaborative TB/HIV activities, ACSM, PPM and MDR-TB are much more in evidence in 2009 compared with previous years (FIGURE 3.2; FIGURE 3.5). This suggests that many HBCs are

[1] *Global tuberculosis control: surveillance, planning and financing. WHO report 2008*. Geneva, World Health Organization, 2008 (WHO/HTM/TB/2008.393).

[2] See http://www.who.int/tb/dots/planning_budgeting_tool/en/index.html

FIGURE 3.1
Reporting of financial data, NTP budgets for 2009

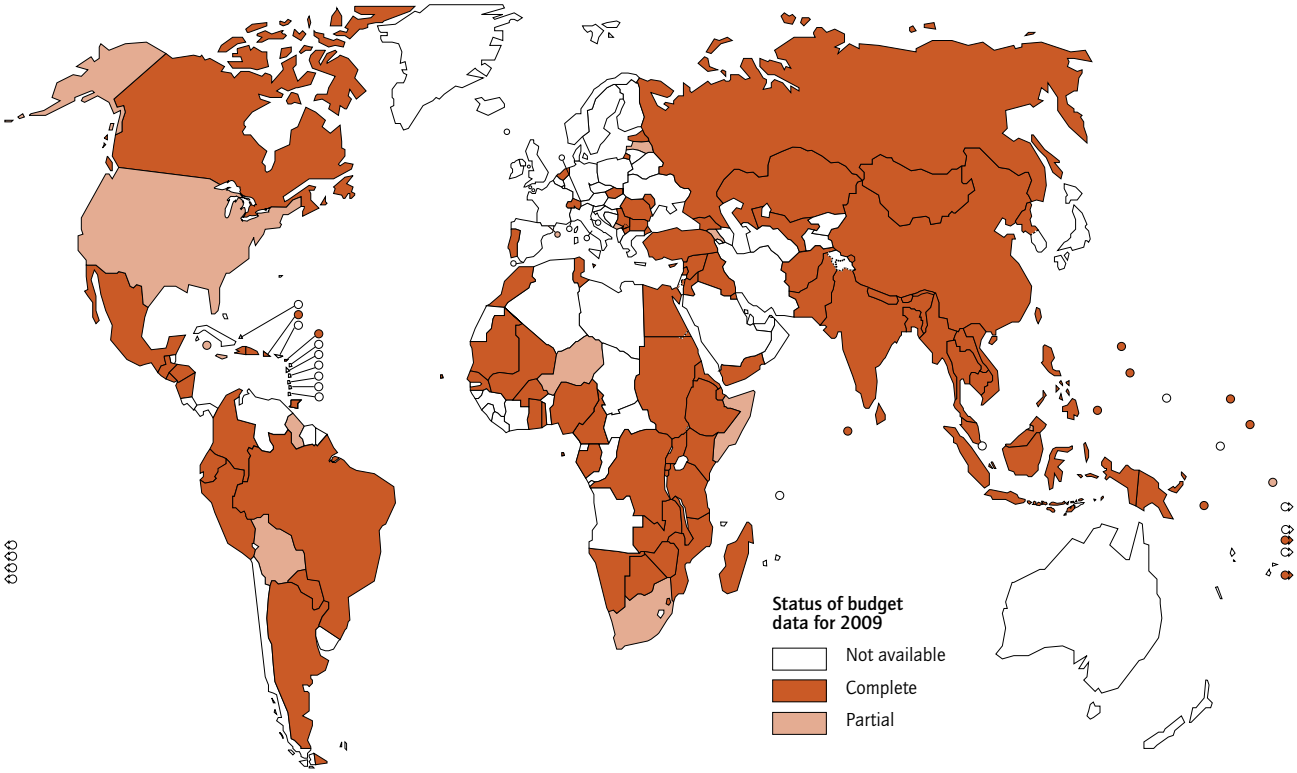
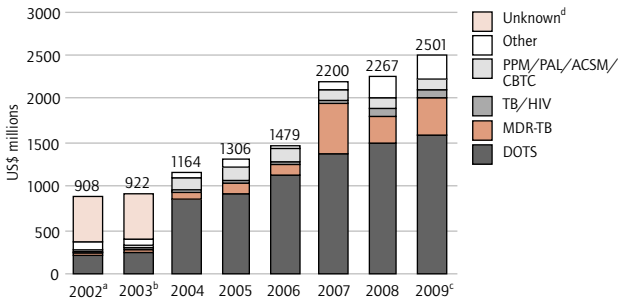


TABLE 3.1
NTP budgets, available funding, cost of utilization of general health-care services and total TB control costs (US$ millions), high-burden countries, 2009

		AVAILABLE FUNDING						
	NTP BUDGET	GOVERNMENT (EXCLUDING LOANS)	LOANS	GRANTS (EXCLUDING GLOBAL FUND)	GLOBAL FUND	FUNDING GAP	COST OF UTILIZATION OF GENERAL HEALTH-CARE SERVICES	TOTAL TB CONTROL COSTS[a]
1 India	100	9.2	37	9.8	14	30	38	138
2 China	225	163	11	0.7	41	9.8	0	225
3 Indonesia	80	34	0	13	17	16	4.8	85
4 Nigeria	44	7.3	0	4.4	13	19	11	55
5 South Africa	352	–	–	–	–	–	251	603
6 Bangladesh	15	4.9	1.1	0	9.2	0.1	5.8	21
7 Ethiopia	26	1.1	0	1.0	6.2	18	8.5	35
8 Pakistan	54	10	0	12	6.4	25	3.8	58
9 Philippines	23	7.9	0	0	10	4.4	11	34
10 DR Congo	53	1.6	0	3.3	11	37	12	66
11 Russian Federation	1 249	1 014	0	1.4	6.9	226	24	1 273
12 Viet Nam	13	5.3	0	4.3	3.9	0	13	27
13 Kenya	37	6.6	1.0	12	2.5	15	5.1	42
14 Brazil	64	50	0.6	1.5	0	11	28	92
15 UR Tanzania	25	7.1	0	4.7	5.4	7.4	4.2	29
16 Uganda	17	1.3	0	0.1	4.8	11	1.2	18
17 Zimbabwe	17	0.6	0	4.1	3.4	9.4	4.1	22
18 Thailand	50	46	0	0	0.8	3.2	1.0	51
19 Mozambique	25	6.4	0	7.9	4.4	6.0	5.9	31
20 Myanmar	11	1.2	0	5.3	0	4.3	1.9	13
21 Cambodia	11	1.1	0	1.3	4.6	3.7	2.5	13
22 Afghanistan	10	0.2	0	5.4	4.1	0.3	1.2	11
High-burden countries	**2 501**	**1 379**	**50**	**93**	**169**	**457**	**438**	**2 939**

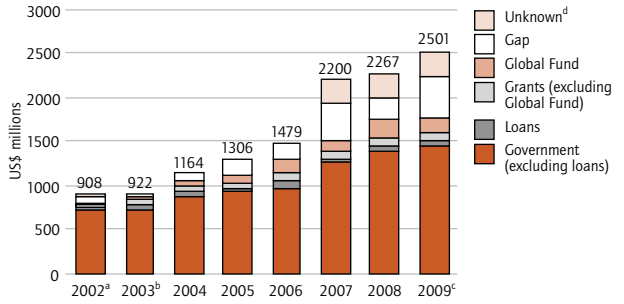
– Indicates not available.
[a] Calculated as NTP budget plus the cost of utilization of general health-care services.

■ **FIGURE 3.2**
NTP budgets by line item, high-burden countries, 2002–2009



[a] Estimates assume budget 2002 equal to expenditure 2002 (Ethiopia), budget 2003 (Afghanistan, Bangladesh, Mozambique and Uganda) or expenditure 2003 (Russian Federation and Zimbabwe).
[b] Estimates assume budget 2003 equal to expenditure 2003 (Russian Federation and Zimbabwe).
[c] Estimates assume budget 2009 equal to budget 2008 for South Africa.
[d] "Unknown" applies to Afghanistan 2002–2004, Russian Federation 2002–2003 and Mozambique 2002–2003. In these years, a breakdown by line item was not available.

■ **FIGURE 3.3**
NTP budgets by source of funding, high-burden countries, 2002–2009



[a] Estimates assume budget 2002 equal to expenditure 2002 (Ethiopia), budget 2003 (Afghanistan, Bangladesh, Mozambique and Uganda) or expenditure 2003 (Russian Federation and Zimbabwe).
[b] Estimates assume budget 2003 equal to expenditure 2003 (Russian Federation and Zimbabwe).
[c] Estimates assume budget 2009 equal to budget 2008 for South Africa.
[d] "Unknown" applies to Afghanistan 2004, DR Congo 2002, Nigeria 2002, South Africa 2007–2009 and UR Tanzania 2007. In these years, a breakdown by funding source was not available or only partially available.

expanding the range of interventions to control TB, in line with the Stop TB Strategy.

The large budget increases described above have been accompanied by big improvements in available funding (FIGURE 3.3; FIGURE 3.4). Funding for NTP budgets in the 22 HBCs reached US$ 1.8 billion in 2009, up from US$ 0.8 billion in 2002. Governments of HBCs have provided most of the available funding since 2002; this funding amounts to US$ 1.4 billion in 2009 (57% of the total budget, and 85% of the available funding) (TABLE 3.1).[1] Financing from the Global Fund has become more important since 2004, reaching US$ 169 million (7% of the total budget and 10% of the available funding) in 2009. The Global Fund accounts for 65% of total grant funding for HBCs in 2009. Grants provided to HBCs from sources other than the Global Fund have not changed much since 2002, and in 2009 account for 4% of the total budget (and 5% of available funding).

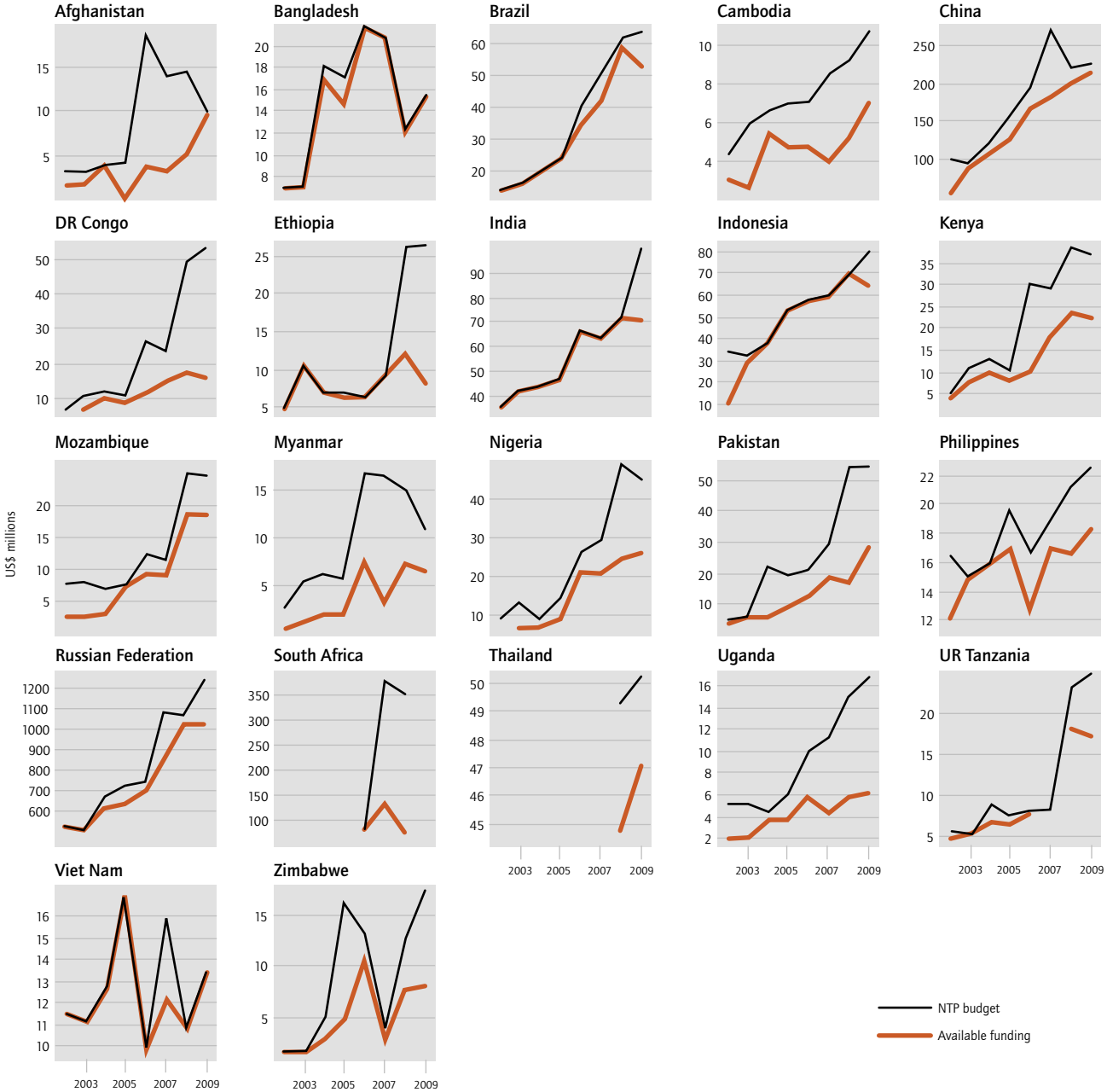
Despite these increases in funding, funding gaps that total US$ 457 million (18% of the total budget) have been reported for 2009; this could be as high as US$ 0.7 billion if the funding gap in South Africa could be accurately quantified (TABLE 3.1).[2] All HBCs except Viet Nam reported funding gaps in 2009. In India, Indonesia and Pakistan, these gaps may be reduced or closed by funding from grants from the Global Fund approved in round 8 or via the so-called "rolling continuation channel" of funding (ANNEX 1).

Most of the additional domestic funding since 2002 (government funding including loans) has come from three countries only: Brazil, China and the Russian Federation (an extra US$ 717 million in 2009 compared with 2002). These three countries plus Thailand will fund 77% or more of their NTP budgets from domestic sources in 2009 (TABLE 3.1). In other HBCs, increases in funding have come mainly from the Global Fund. In 2009, grants from the Global Fund will finance around one-third or more of the NTP budget in seven countries: Bangladesh, the Philippines, Cambodia, Afghanistan, Nigeria, Uganda and Viet Nam (in that order). In addition, grants from sources besides the Global Fund will finance one third or more of the NTP budget in Afghanistan, Mozambique, Myanmar, Kenya and Viet Nam (TABLE 3.1).

In absolute terms, the largest funding gaps are those reported by the Russian Federation, the Democratic Republic of the Congo, India, Pakistan, Nigeria and Ethiopia (in that order), which together account for 78% of reported funding gaps. The Russian Federation alone accounts for 50% of the total funding gaps reported by HBCs. Proportionally, the largest gaps are (in order) in the Democratic Republic of the Congo, Ethiopia, Uganda, Zimbabwe, Pakistan, Nigeria, Kenya, Myanmar and Cambodia; funding gaps in these countries represent more than one-third of the required budget (TABLE 3.1). Only three HBCs reported no funding gap

[1] Figures would probably be higher if complete information on funding from provincial governments in South Africa were available.
[2] The 11% of NTP budgets for which funding is unknown, which is accounted for by South Africa, is likely to be a mixture of funding from provincial governments and a funding gap (ANNEX 1).

FIGURE 3.4
NTP budgets and available funding, high-burden countries, 2002–2009



or a negligible funding gap: Afghanistan, Bangladesh and Viet Nam.

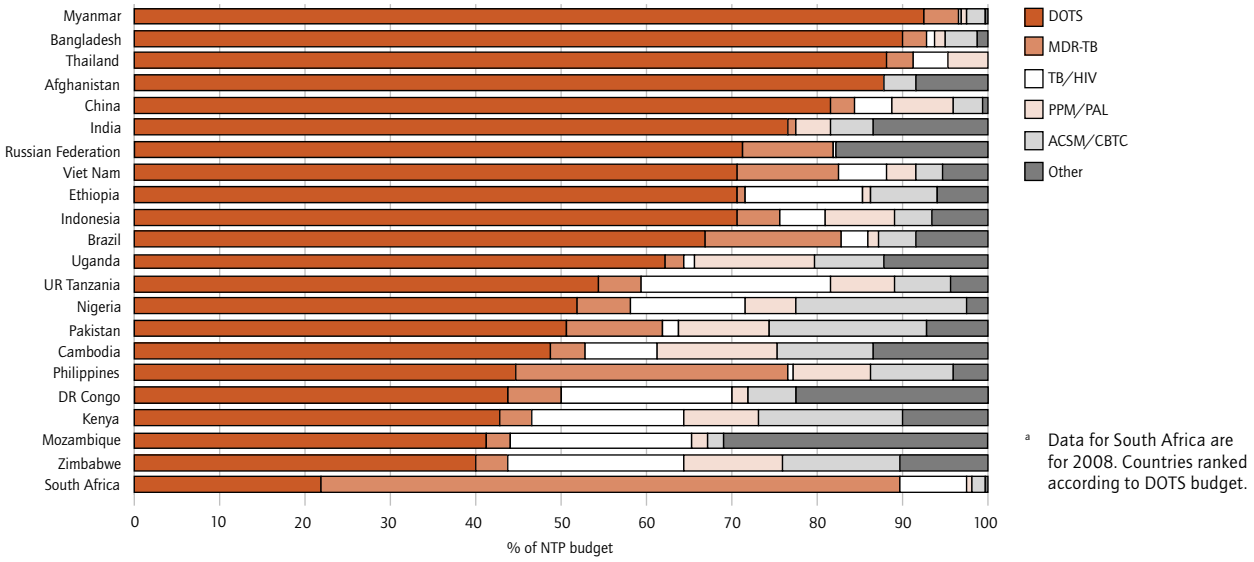
3.2.2 All countries

WHO began collecting financial data from all countries (in addition to the 22 HBCs) in 2003 and reported these data for the first time in 2004. Total NTP budgets in 2009, by WHO region and source of funding, are shown for the 103 countries for which data are available (22 HBCs and 81 other countries) in FIGURE 3.6.[1] Globally, these countries account for 93% of incident TB cases; at regional level, they account for almost all TB cases in the African, Eastern Mediterranean, South-East Asia and Western Pacific regions (89–99.6%, depending on the region), for 85% of the regional total in the Region of the Americas (up from 74% in 2008), and for 66% of the regional total in the European Region. NTP budgets amount to US$ 3.6 billion in 2009, up from US$ 2.6 billion in 2008 (for countries with 91% of global cases) and US$ 1.6 billion in 2007 (also for countries that accounted for 91% of TB cases globally). The funding gaps reported by these 103 countries total US$ 0.9 billion, of which US$ 0.5 billion is in the European Region. This is somewhat surprising given the relative wealth of the European Region. Overall, the reported funding gap is more than double the US$ 385 million reported for 2008.

Budgetary funding gaps as a proportion of the total bud-

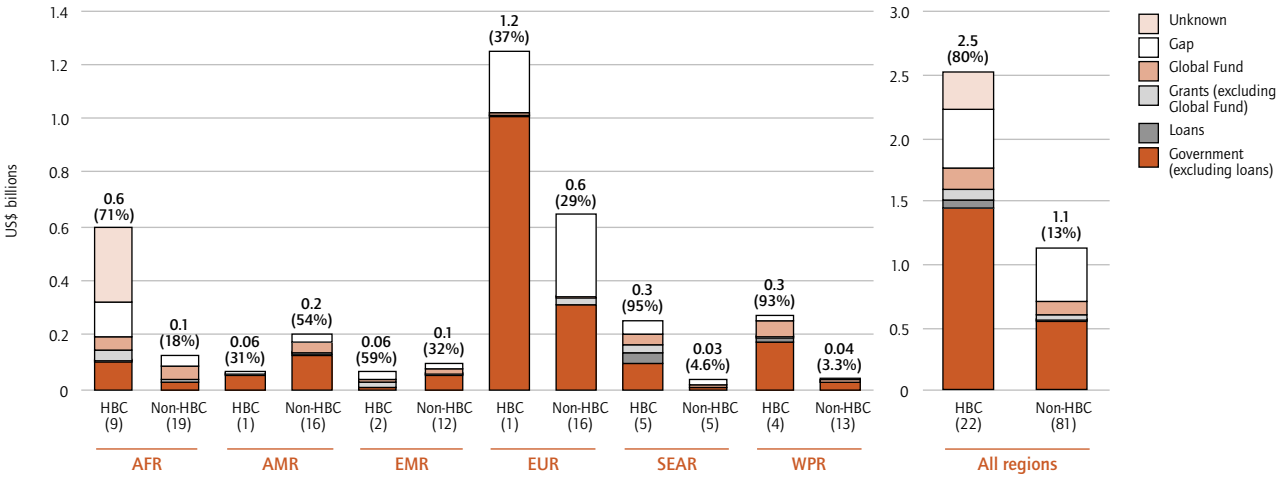
[1] The total of 103 countries is one more than the total of 102 countries mentioned in section 3.1, since South Africa is included in FIGURE 3.6 with the assumption that the budget for 2009 would be the same as the budget reported for 2008.

FIGURE 3.5
NTP budgets by line item, high-burden countries,[a] 2009



[a] Data for South Africa are for 2008. Countries ranked according to DOTS budget.

FIGURE 3.6
Regional distribution of NTP budgets by source of funding, 22 high-burden countries and 81 non high-burden countries, 2009.
Numbers in parentheses above bars show the percentage of all estimated incident cases of TB in the region that are accounted for by the countries included in the bar. Numbers in parentheses on the x-axis show the number of countries contributing to each bar.



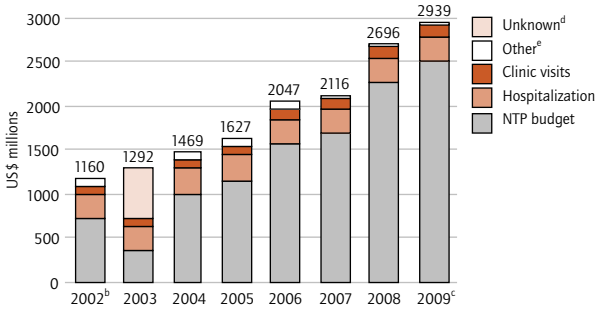
get were higher for non high-burden countries compared with HBCs in the African, European and South-East Asia regions. Funding gaps as a proportion of the total budget were similar for Brazil and non-HBCs in the Region of the Americas. Funding gaps were lower for non high-burden countries relative to HBCs in the Eastern Mediterranean and Western Pacific regions. Overall, NTP budgets per incident TB case were higher for HBCs compared with non-HBCs in the African Region and the European Region, and much lower for HBCs compared with non-HBCs in the Region of the Americas and the Eastern Mediterranean, South-East Asia and Western Pacific regions.

3.3 Total costs of TB control

3.3.1 High-burden countries

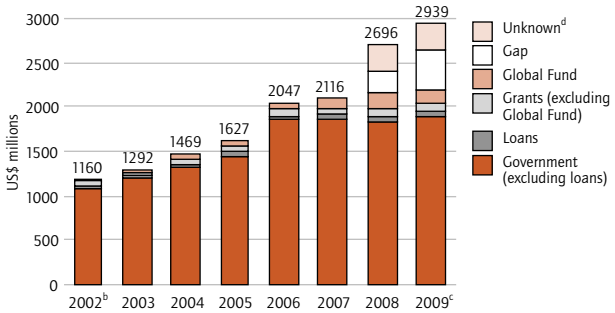
NTP budgets include only part of the resources needed to control TB. Specifically, they do not include the costs associated with using general health-service staff resources and infrastructure for TB control, both of which are used when TB patients are hospitalized or visit outpatient facilities during treatment. For the 22 HBCs combined, the total cost of TB control will reach almost US$ 2.9 billion in 2009 if funding gaps can be closed, almost three times higher than the US$ 1.2 billion actual expenditures estimated for 2002 (FIGURES 3.7–3.10; TABLE 3.1). The total of US$ 2.9 billion is mostly for DOTS (US$ 2 billion, or 69%). The other major components are MDR-TB (US$ 0.4 billion, or 14%; 88% of this total is accounted for by the Russian Federation and South Africa), TB/HIV (US$ 90 million, or 3%) and ACSM

FIGURE 3.7
Total TB control costs by line item, high-burden countries,[a] 2002–2009



[a] Total TB control costs for 2002–2007 are based on expenditure data, whereas those for 2008–2009 are based on budget data.
[b] Estimates assume costs 2002 equal to costs 2003 for Afghanistan, Bangladesh, Mozambique, Nigeria, Uganda and Zimbabwe.
[c] Estimates assume costs 2009 equal to costs 2008 for South Africa.
[d] "Unknown" applies to Russian Federation 2003.
[e] "Other" includes costs for fluorography in the Russian Federation that are not reflected in NTP budget or NTP expenditure data.

FIGURE 3.8
Total TB control costs by source of funding, high-burden countries,[a] 2002–2009



[a] Total TB control costs for 2002–2007 are based on expenditure data, whereas those for 2008–2009 are based on budget data.
[b] Estimates assume costs 2002 equal to costs 2003 for Afghanistan, Bangladesh, Mozambique, Nigeria, Uganda and Zimbabwe.
[c] Estimates assume costs 2009 equal to costs 2008 for South Africa.
[d] "Unknown" applies to South Africa 2008–2009.

(US$ 70 million, or 2%). The remaining 12% includes PPM, surveys of the prevalence of TB disease, community TB care and a variety of miscellaneous activities.

Total costs have increased year-on-year since 2002 across all HBCs, a pattern that is repeated in most individual countries (FIGURE 3.9). Exceptions are Bangladesh and Viet Nam; however, the apparently low expenditures in these countries in 2007 probably reflect only partial reporting of expenditures. The steady climb in the total resources available for TB control in Brazil, China and India since 2002 is impressive. Increases in projected costs during 2002–2009 arise because of the large increases in NTP budgets (described above) and, to a much lesser extent, because of the higher costs of clinic visits and hospitalization that are associated with treating more patients (FIGURE 3.7).

As in previous years, the Russian Federation and South Africa rank first and second in terms of total costs. Together, they account for US$ 1.9 billion (64%) of the total of US$ 2.9 billion (FIGURE 3.10; TABLE 3.1). China (US$ 225 million), India (US$ 138 million), Brazil (US$ 92 million) and Indonesia (US$ 85 million) rank third to sixth. These six countries account for 82% of the total cost of TB control in the 22 HBCs in 2009. In South Africa, there are two major reasons for the high cost of TB control estimated for 2009. One is the large costs associated with maintaining around 8000 TB beds in district hospitals and specialized TB hospitals at a unit price per bed-day of around US$ 100 and US$ 40, respectively. The second is a large budget for the diagnosis and treatment of MDR-TB (ANNEX 2; SECTION 3.2). The largest components of the budget for MDR-TB are for renovating and constructing infrastructure in line with a national policy of hospitalizing all patients with MDR-TB for at least six months; improving infection control in MDR-TB and XDR-TB units as well as in general district hospitals; and providing second-line anti-TB drugs for the enrolment of around 5000 patients on treatment. High costs in the Russian Federation in 2009 are associated with continued staffing and maintenance of an extensive network of TB hospitals and sanatoria; a large budget for second-line anti-TB drugs to treat MDR-TB patients (US$ 133 million, with an estimated total of about 4000 cases to be enrolled on treatment in 2009); and continued use of fluorography for mass population screening.

Funding for the general health-service staff and infrastructure used by TB patients during clinic visits and hospitalization is assumed to be provided by governments (ANNEX 2). This assumption, together with the implicit assumption that health systems have sufficient capacity to support the treatment of a growing numbers of patients in 2009,[1] means that the resources available for TB control are estimated to have increased from US$ 1.2 billion in 2002 to US$ 2.2 billion in 2009 (FIGURE 3.8). For all HBCs, the estimated gap between the funding already available and the total cost of TB control is between US$ 0.5 and US$ 0.7 billion in 2009.[2]

Of the US$ 2.2 billion available in the 22 HBCs in 2009, 88% is from HBC governments, 8% (US$169 million) is from the Global Fund and 4% (US$ 94 million) is from grants from sources other than the Global Fund. The distribution of funding sources is different when the Russian Federation and South Africa are excluded: the government contribution to available funding drops to 70%, the Global Fund contribution increases to 19%, and grants from sources besides the Global Fund account for 11%.

As in previous years, there is considerable variation in the distribution of funding sources among countries (FIGURE 3.11; TABLE 3.1). For example, Afghanistan is highly dependent on grant financing and four other countries (Ban-

[1] Nonetheless, the capacity of health systems to manage an increasing number of TB patients warrants further analysis, particularly in countries where the number of patients will need to increase substantially to achieve the MDG and related Stop TB Partnership targets for TB control.
[2] The range reflects uncertainty about the level of funding from provincial governments in South Africa.

FIGURE 3.9
Total TB control costs, high-burden countries, 2002–2009

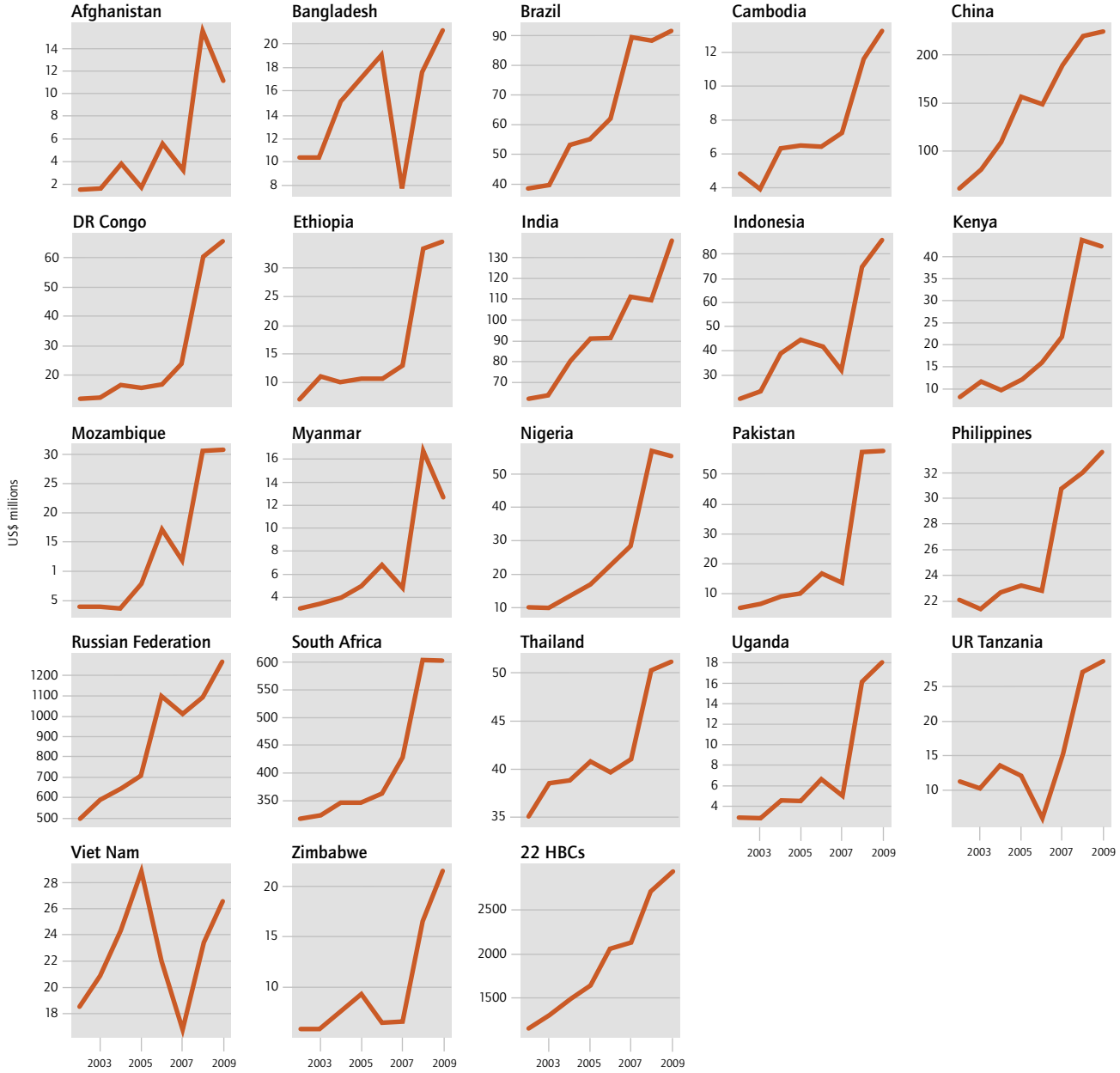


FIGURE 3.10
Total TB control costs by country, high-burden countries, 2002–2009

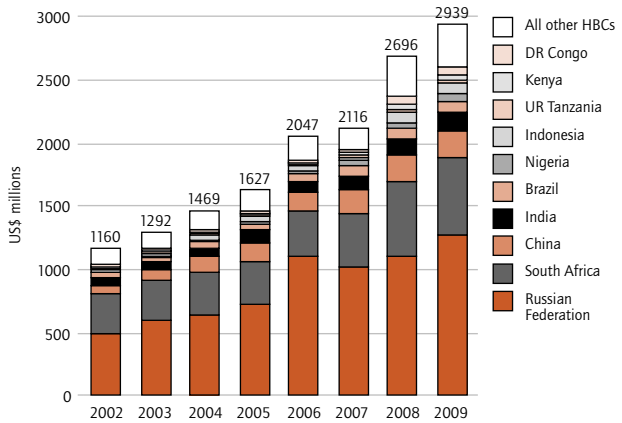
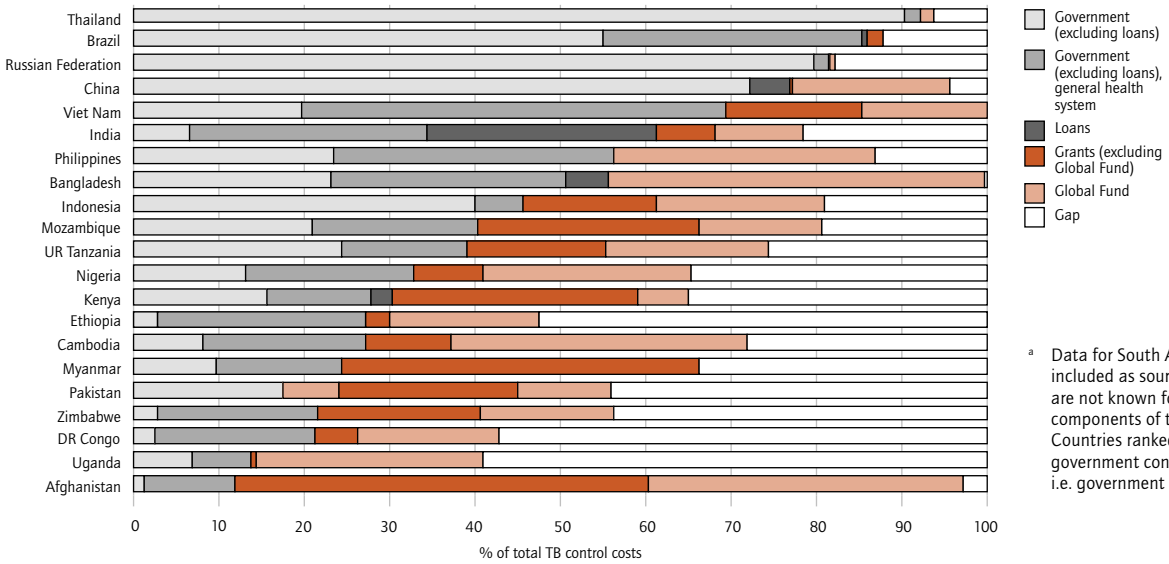


FIGURE 3.11
Total TB control costs by source of funding, 21 high-burden countries,[a] 2009

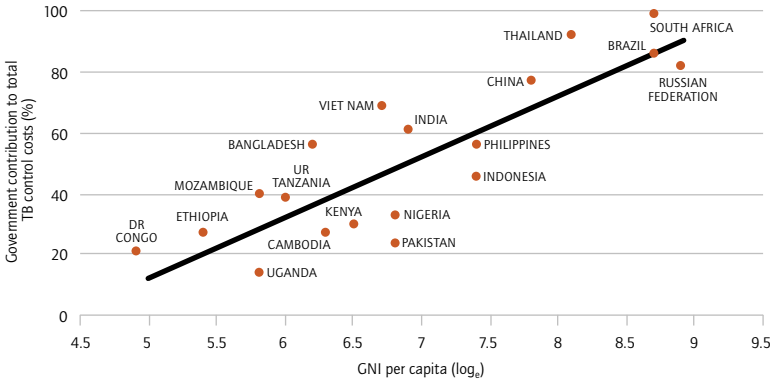


[a] Data for South Africa not included as sources of funding are not known for most components of the budget. Countries ranked according to government contribution, i.e. government plus loans.

gladesh, Cambodia, Mozambique and Myanmar) rely on grants to cover at least 40% of the total resources needed for TB control. In nine HBCs, grant funding accounts for more than 50% of the currently available funding in 2009 (Afghanistan, Cambodia, the Democratic Republic of the Congo, Kenya, Mozambique, Myanmar, Pakistan, Uganda, and Zimbabwe). In contrast, grant financing contributes less than 2% of the total funding required in 2009 in Brazil, the Russian Federation and Thailand.

The share of the total costs financed by HBC governments is closely related to average income levels (FIGURE 3.12), although there appears to be scope to increase the government contribution in several countries (for example, Indonesia, Pakistan and the Russian Federation).

FIGURE 3.12
Government contribution (including loans) to total TB control costs by gross national income (GNI) per capita, 19 high-burden countries,[a] 2009



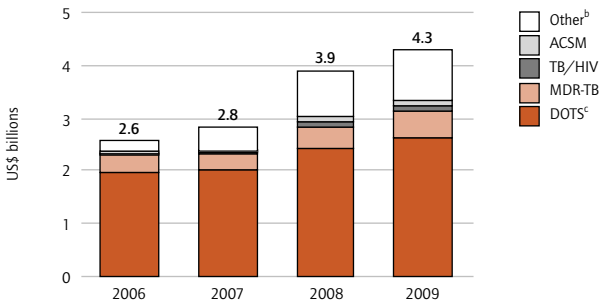
[a] Data on GNI per capita not available for Afghanistan, Myanmar and Zimbabwe.

3.3.2 All countries

Total costs for 2006–2009 can be estimated for 111 countries that collectively account for 93% of TB cases globally (FIGURE 3.13).[1] The total costs of TB control will increase from US$ 2.6 billion in 2006 to US$ 4.3 billion in 2009 (if funding gaps in 2009 can be closed). DOTS implementation accounts for the largest single share of these costs, but the share for MDR-TB and a range of other interventions is increasing. The share of total costs accounted for by collaborative TB/HIV activities and ACSM remains small.

For 89 countries outside the 22 HBCs for which data are available, trends in total costs by region and for all regions combined are shown in FIGURE 3.14. Costs are generally

FIGURE 3.13
Total TB control costs by line item, 22 high-burden countries and 89 other countries,[a] 2006–2009

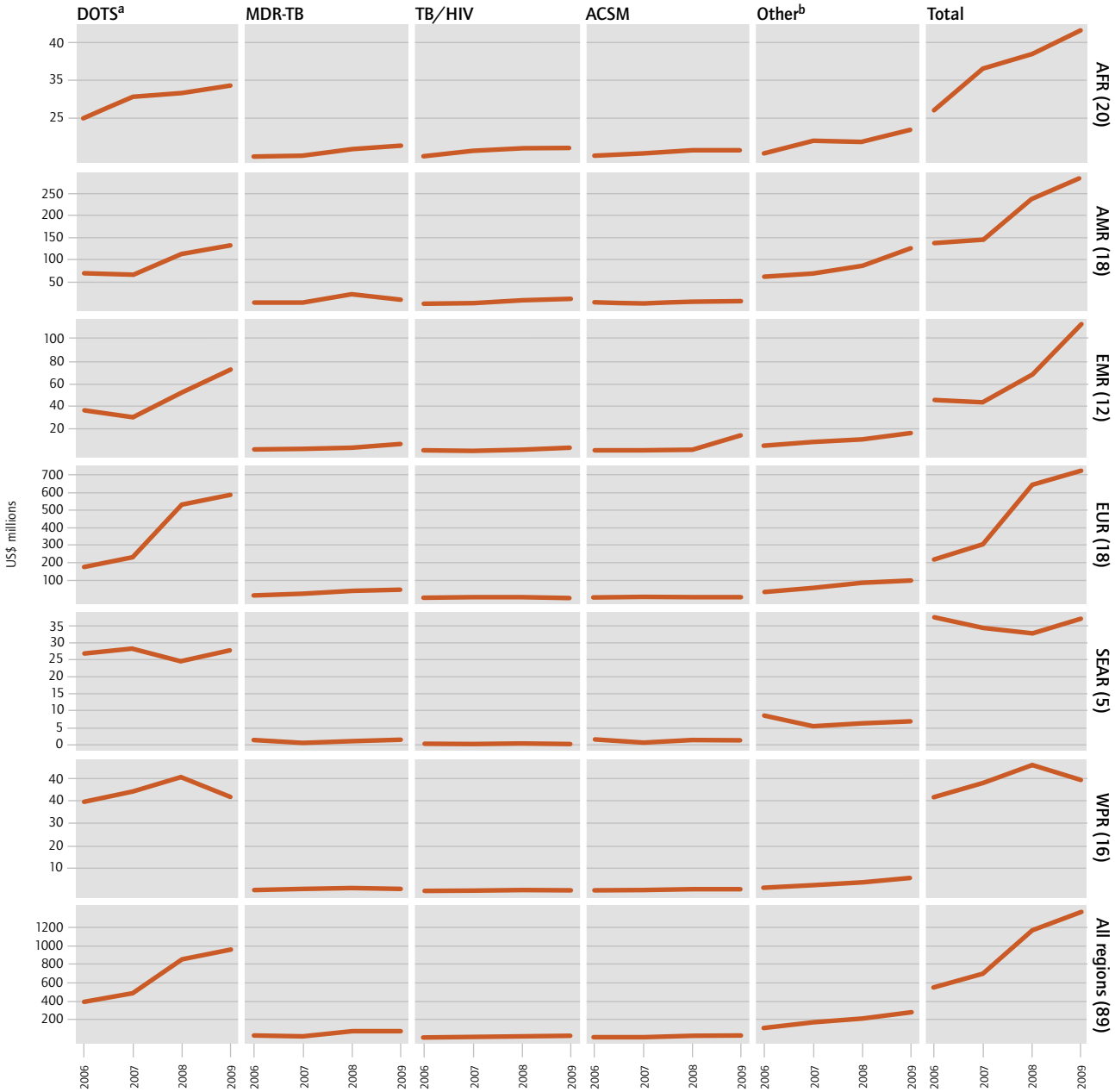


[a] These 111 countries account for 93% of the global total of 9.27 million incident cases of TB estimated in 2007.
[b] "Other" includes PPM, PAL, CBTC, operational research, surveys and other.
[c] DOTS includes the cost of clinic visits and hospitalization.

[1] These 111 countries reported data for at least two of the years 2006–2009. For countries that did not report data in all four years, costs were estimated using data for the two or three years for which data were reported.

FIGURE 3.14

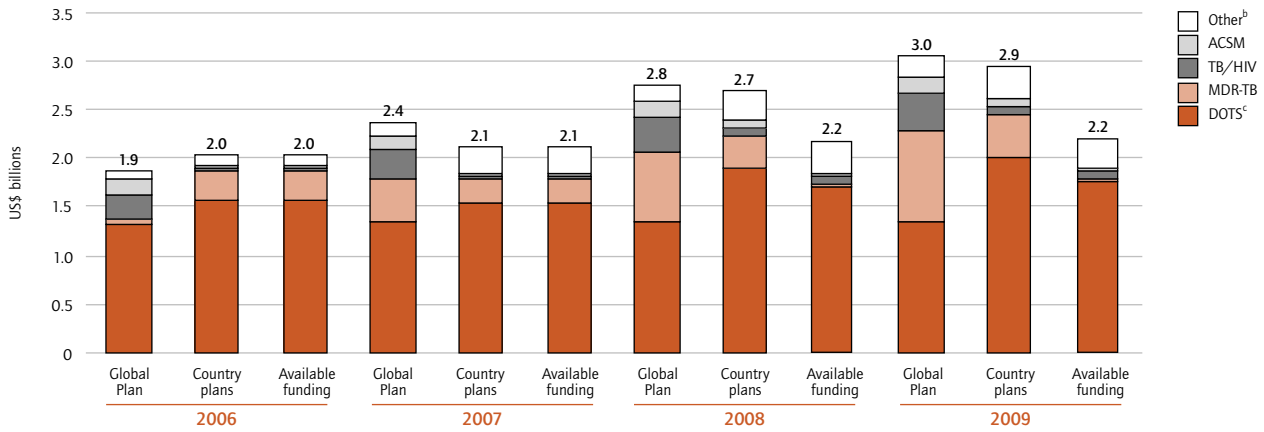
Total TB control costs by region, 89 non high-burden countries, 2006–2009. Numbers in parentheses show the number of countries included in the analysis in each region.



[a] DOTS includes the cost of clinic visits and hospitalization.
[b] "Other" includes PPM, PAL, CBTC, operational research, surveys and other.

FIGURE 3.15

Total TB control costs: the Global Plan compared with country plans[a] and available funding, high-burden countries, 2006–2009



[a] Costs of country plans are based on expenditures (2006–2007) and budgets (2008–2009).
[b] "Other" includes PPM, PAL, CBTC, operational research, surveys and other.
[c] DOTS includes the cost of clinic visits and hospitalization.

increasing (the exception being countries in the South-East Asia Region where the trend is relatively flat) and are mostly accounted for by DOTS implementation.

3.4 Comparisons with the Global Plan

The Global Plan sets out what needs to be done between 2006 and 2015 to achieve the 2015 targets for TB control that have been set within the context of the Millennium Development Goals (MDGs) and by the Stop TB Partnership (see also CHAPTER 1 and CHAPTER 2). To assess the extent to which planning and financing for TB control at country level are aligned with the Global Plan, the financial resources estimated to be required for TB control in the Global Plan can be compared with the financial data reported by countries.

3.4.1 High-burden countries

The cost of TB control and available funding reported by countries during the period 2006–2009 are compared with the funding requirements included in the Global Plan in FIGURE 3.15.[1] In 2006, actual costs (based on expenditure data) were slightly above those estimated to be required in the Global Plan, although there were shortfalls for collaborative TB/HIV activities and ACSM. From 2007 to 2009, the total funding requirements set out in country plans almost match those included in the Global Plan (for example, US$ 2.9 billion and US$ 3.0 billion respectively in 2009). However, available funding falls short of the amounts included in country plans and the Global Plan. The gap was US$ 0.3 billion in 2007 and US$ 0.8 billion in 2009.

For MDR-TB and collaborative TB/HIV activities, the funding estimated to be required in the Global Plan is much higher than the funding estimated to be required by countries. For MDR-TB, the shortfall is mainly accounted for by China and India. In contrast, the funding estimated to be required for DOTS by countries is higher than the funding estimated to be required in the Global Plan.

These aggregated comparisons conceal the fact that five HBCs have planned costs consistent with those detailed in the Global Plan in 2009: Brazil, Cambodia, the Democratic Republic of the Congo, Thailand and the United Republic of Tanzania. In addition, there are five countries in which the discrepancy is due to the mid-2007 revision of the MDR-TB component of the Global Plan to include much more ambitious targets.[2] With the exception of MDR-TB, country plans are consistent with the Global Plan in China, Indonesia, the Philippines, the Russian Federation and Viet Nam (ANNEX 1).

For collaborative TB/HIV activities, the shortfall is mainly in Cambodia, the Democratic Republic of the Congo, Ethiopia, Kenya, India, Mozambique, Myanmar, Nigeria, Uganda and Zimbabwe. In these countries, the shortfall is exaggerated because the funding requirements for several collaborative TB/HIV activities (including the most costly ones such as ART) are part of the budgets of national AIDS control programmes, rather than NTPs.[3] For ACSM, there are five countries with ACSM budgets comparable to or larger than those indicated in the Global Plan: Brazil, Cambodia, Kenya, Pakistan and the Philippines.

Country-by-country comparisons with the Global Plan are presented in ANNEX 1.

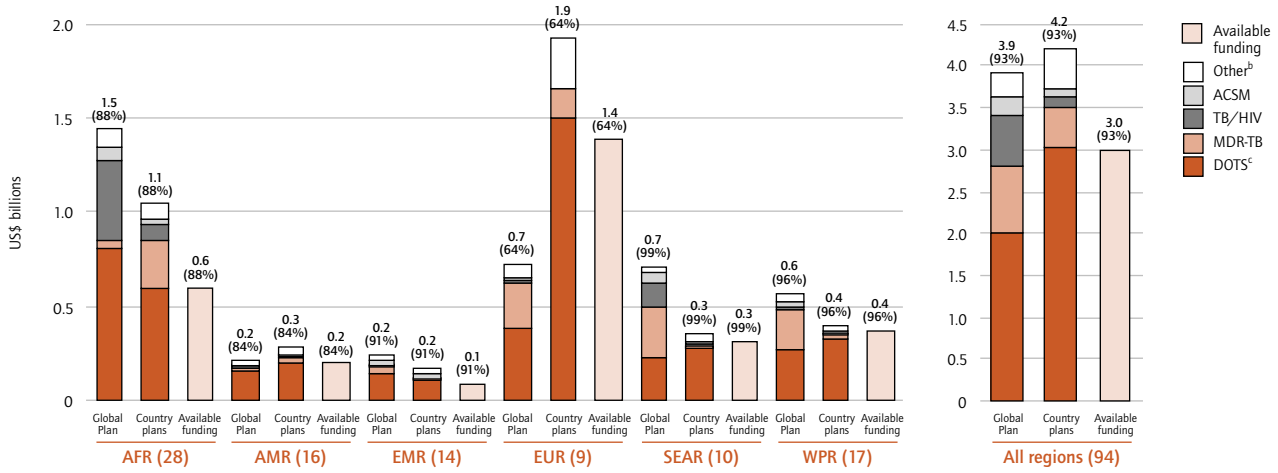
3.4.2 All countries

The financial data submitted to WHO allow total TB control costs for 2009 to be estimated for 94 of the 171 countries that were included in the Global Plan (22 HBCs and 72 other countries).[4] These 94 countries account for 93% of all incident cases of TB arising each year.[5]

[1] See ANNEX 2 for an explanation of how costs for individual countries were derived from the Global Plan.
[2] *The Global MDR-TB & XDR-TB response plan, 2007–2008*. Geneva, World Health Organization, 2007 (WHO/HTM/TB/2007.387).
[3] In most of the countries that reported data, the costs of HIV testing, co-trimoxazole preventive therapy and antiretroviral treatment were part of the budgets of national AIDS control programmes rather than the budgets of NTPs.
[4] Of the 103 countries included in FIGURE 3.6, nine were not considered in the Global Plan cost estimates.
[5] All of the 171 countries included in the Global Plan accounted for 98% of TB cases globally in 2004.

■ **FIGURE 3.16**

Total TB control costs in 22 high-burden countries and 72[a] other countries: the Global Plan compared with country plans and available funding, 2009. Numbers in parentheses above bars show the percentage of all estimated incident cases of TB in the region that are accounted for by the countries included in the bar. Numbers in parentheses on the x-axis show the number of countries contributing to each bar.



[a] Canada, Cyprus, Malta, the Netherlands, Portugal, Serbia, Slovakia, the former Yugoslav Republic of Macedonia and Switzerland are excluded because they were not included in the Global Plan.

[b] "Other" includes PPM, PAL, CBTC, operational research, surveys and other.

[c] DOTS includes the cost of clinic visits and hospitalization.

A regional comparison of costs planned by countries with the costs included in the Global Plan is shown for these 94 countries in FIGURE 3.16. Overall, country plans indicate planned costs of US$ 4.2 billion in 2009 (up from US$ 3.1 billion in 2008 and US$ 2.3 billion in 2007), compared with US$ 3.9 billion in the Global Plan, and available funding of US$ 3.0 billion. Of the available funding of US$ 3.0 billion, 87% is funding from governments (including loans), 9% is funding from Global Fund grants and 4% is funding from donors other than the Global Fund.

The total of US$ 4.2 billion required for full implementation of country plans in these countries in 2009 is mostly for DOTS (US$ 3.0 billion, or 72%). The other major components are MDR-TB (US$ 0.5 billion, or 12%; 76% of the total for MDR-TB is accounted for by the Russian Federation and South Africa), collaborative TB/HIV activities (US$ 120 million, or 3%) and ACSM (US$ 100 million, or 2%). The remaining 11% includes PPM, surveys of the prevalence of TB disease, community TB care and a variety of miscellaneous activities.

The apparent similarity between the Global Plan and country plans when data are aggregated for all countries is distorted by the comparatively high cost of country plans in the European Region. As FIGURE 3.16 makes clear, the funding estimated to be required for MDR-TB in country plans falls far short of Global Plan estimates in the South-East Asia and Western Pacific regions. This is consistent with the relatively small number of cases of MDR-TB that countries in these regions (notably China and India) expect to diagnose and treat in 2009 (as documented in CHAPTER 2). Country plans also indicate lower planned spending on collaborative TB/HIV activities compared with the Global Plan in the African Region, which has 79% of the estimated global total of HIV-positive TB cases. This is consistent with data on the current level of implementation of collaborative TB/HIV activities (CHAPTER 2), although the difference (as noted above) is exaggerated because the planned activities and associated funding of national AIDS control programmes are not included in the data reported by NTPs.[1] It is only in the Eastern Mediterranean Region and the Region of the Americas that country plans appear to be consistent with the Global Plan.

Excluding the European Region, the funding gaps reported by countries amount to US$ 0.6 billion in 2009 (US$2.3 billion required compared with US$ 1.7 billion available). Compared with the needs set out in the Global Plan, the gap is US$ 1.6 billion (US$ 3.2 billion required according to the Global Plan compared with available funding of US$ 1.6 billion). In the European Region, the funding available in 2009 exceeds the funding estimated to be required in the Global Plan. One explanation is the reductions anticipated in the Global Plan in the use of hospitalization during treatment, which are not happening in practice.

These differences between the funding requirements set out in country plans and the Global Plan suggest that country planning, budgeting and financing lag behind the Global Plan in three major areas: DOTS and collaborative TB/HIV activities in Africa, and diagnosis and treatment of MDR-TB in the European, South-East Asia and Western Pacific regions (and within these regions, in the Russian Federation, India and China in particular).

[1] This may also explain the higher costs of collaborative TB/HIV activities in the Global Plan compared with country plans in the South-East Asia Region. For example, the only TB/HIV-related costs included in the NTP budget in India are those for HIV testing of TB patients, which is a relatively inexpensive intervention. In India, it is not known to what extent other activities are budgeted for and funded by the national AIDS control programme.

WHO has developed a planning and budgeting tool that is designed to help countries to align their plans and budgets with the Stop TB Strategy and the targets set out in the Global Plan, as well as to produce more accurate country-specific estimates of the financial resources required to achieve these targets.[1] The development and use of this tool is described in BOX 3.1.

3.5 Budgets and costs per patient

Budgets and costs per patient in HBCs are shown in TABLE 3.2. The budget for first-line anti-TB drugs per patient is lowest in Cambodia (US$ 18) and highest in Brazil (US$ 121), Thailand (US$ 161) and the Russian Federation (US$ 308). In most countries, the budget is in the range US$ 20–40, with a median of US$ 33.

The budget per patient for DOTS treatment also varies. Only two countries (India and Myanmar) have budgets below US$ 100 per patient. A total of four countries have budgets in the range US$ 100–200 per patient, four are in the range US$ 200–300 and seven are in the range US$ 300–600.[2] The four countries with a budget per patient exceeding US$ 600 are Brazil, Mozambique, the Russian Federation and Thailand. Of these, all except Mozambique are middle-income countries where budgets are expected to be higher, although the budget of US$ 9292 per patient in the Russian Federation is exceptionally high compared with all other HBCs. As noted in SECTION 3.2, these high costs can be explained by extensive use of hospitalization during treatment.

In 2009, the total cost per patient treated in a DOTS programme is estimated at under US$ 100 in only one country: Myanmar. It is in the range US$ 100–300 in seven countries, and US$ 300–500 in nine countries (up from three in 2007 and 2008). Four countries have much higher costs: Brazil, Mozambique, the Russian Federation and Thailand. As already noted, three of these countries are middle-income countries with generally higher prices for the inputs needed for TB control, while the Russian Federation also has large budgets for MDR-TB treatment as well as maintenance of hospital infrastructure. The relatively high cost for Mozambique relative to other African countries is mainly due to comprehensive budgeting for collaborative TB/HIV activities.

Among the low-income countries, there is no obvious relationship between the cost per patient treated and GNI per capita. For example, in India the cost per patient treated is low relative to income levels, while in the Democratic Republic of the Congo and Mozambique this cost is relatively high compared with GNI per capita (data not shown). Overall, budgets and costs per patient are generally increasing, with a median increase of 350% per patient in the NTP budget per patient and a median increase in the total cost per patient of 240% (although the median increase for first-line drugs was only 20%).

[1] See http://www.who.int/tb/dots/planning_budgeting_tool/en/index.html

[2] Figures were not calculated for South Africa because the financial data available for 2009 were not complete. See also FIGURE 3.1.

BOX 3.1

Planning and budgeting for TB control: the WHO TB planning and budgeting tool

The WHO TB planning and budgeting tool is designed to help countries to develop comprehensive plans and budgets for TB control within the framework of the Stop TB Strategy and the Global Plan to Stop TB, and to use these as the basis for resource mobilization from national governments and donors. The tool was developed with support from USAID's TB Control Assistance Program, and can be downloaded (together with accompanying documentation) from the Stop TB Department's web site http://www.who.int/tb/dots/planning_budgeting_tool/en/.

Major advantages of using the tool include: (i) it allows plans and budgets to be set out comprehensively in one place in a standardized format; (ii) it offers a ready-made list of inputs and activities to consider when planning and budgeting for each component of the Stop TB Strategy; (iii) it includes epidemiological and demographic projections as well as information about the targets set out in the Global Plan; (iv) it provides a solid foundation for resource mobilization from national and local governments as well as donors such as the Global Fund; (v) it is easy to revise or update plans and budgets because it is set out in Excel; and (vi) it automatically produces summary analyses in the form of figures and tables. Overall, these benefits should help to improve the quality of planning and budgeting.

A draft version of the tool was developed in April–May 2006. Following extensive field-testing in countries in the African and South-East Asia regions and the Region of the Americas, a final version with was produced by January 2007. The tool was translated into English, French, Spanish and Russian.

Promotion and practical application of the tool started in 2007. Four planning and budgeting workshops were conducted: two in the African Region for a total of 34 countries; one in the South-East Asia region for nine countries: and one in the Region of the Americas for 11 countries. Two training workshops have also been conducted: one for seven countries in Latin America and one for three countries in the Western Pacific Region. During these workshops, feedback about the tool was very positive. Other examples of how the tool has been disseminated include presentations at workshops for the development of Global Fund proposals, presentations at international meetings and regional NTP manager meetings; a training workshops for technical partners and staff from WHO regional and country offices, and inclusion of the tool in an international course on management and budgeting organized annually by the International Union Against Tuberculosis and Lung Disease.

To date, 27 countries are known to have used the tool to budget their national strategic plans for TB control. The Democratic Republic of the Congo, Ethiopia, Kenya, Mozambique, Myanmar, Thailand and Zambia are examples of countries that have developed particularly comprehensive and detailed plans and budgets using the tool. Most of the countries that have attended one of the workshops have used the tool to budget at least some of the components of the Stop TB Strategy. Others have used it to develop the budget component of a Global Fund proposal. A recent example is Indonesia, whose proposal was rated Category 1 (recommended for funding with no or minor clarifications).

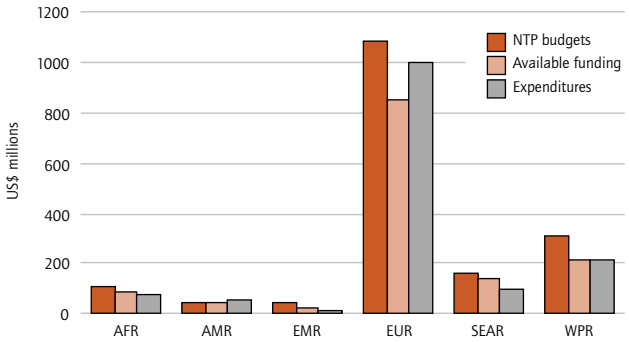
In future, the tool could provide the basis for National Strategy Applications (NSAs) to the Global Fund.

TABLE 3.2
Total TB control costs and NTP budgets per patient for DOTS treatment, high-burden countries, 2009

	2009 (US$)			CHANGES SINCE 2002, (FACTOR[a])		
	FIRST-LINE DRUGS BUDGET	NTP BUDGET (EXCLUDING MDR-TB)	TOTAL COST (EXCLUDING MDR-TB)	FIRST-LINE DRUGS BUDGET	NTP BUDGET (EXCLUDING MDR-TB)	TOTAL COST (EXCLUDING MDR-TB)
1 India	22	80	111	2.2	3.5	1.9
2 China	28	226	226	1.7	1.7	1.7
3 Indonesia	48	288	307	1.5	2.5	2.3
4 Nigeria	25	351	442	0.5	2.7	2.0
5 South Africa	–	–	–	–	–	–
6 Bangladesh	24	104	144	1.2	1.3	1.2
7 Ethiopia	24	166	220	0.9	3.8	3.4
8 Pakistan	58	205	221	1.0	4.5	2.4
9 Philippines	34	112	193	0.7	0.9	1.0
10 DR Congo	27	359	447	0.8	3.9	2.6
11 Russian Federation	308	9292	9491	4.7	2.0	2.5
12 Viet Nam	50	120	254	1.5	1.4	1.3
13 Kenya	21	331	378	0.6	6.4	3.9
14 Brazil	121	812	1234	2.7	4.9	2.6
15 UR Tanzania	28	407	480	0.7	5.0	2.6
16 Uganda	74	327	351	1.4	7.0	5.2
17 Zimbabwe	68	396	491	2.3	12	7.0
18 Thailand	161	810	827	–	–	–
19 Mozambique	28	679	847	1.3	9.8	6.2
20 Myanmar	33	73	87	1.9	3.5	1.6
21 Cambodia	18	264	329	0.4	2.0	1.7
22 Afghanistan	37	329	368	0.5	1.1	3.2
High-burden countries (median value)	**33**	**327**	**351**	**1.2**	**3.5**	**2.4**

– Indicates not available.
[a] Calculated as 2009 value divided by 2002 value.

FIGURE 3.17
NTP budgets, available funding and expenditures by region, 19 high-burden countries,[a] 2007



[a] AFR excludes South Africa and Uganda. SEAR excludes Thailand.

3.6 Expenditures compared with available funding and changes in the number of patients treated

Countries that have received large increases in funding face two important challenges: to spend the extra money, and to translate extra spending into improved rates of case detection and treatment success. To date, WHO has been able to conduct analyses for the HBCs only.

The ability to mobilize resources can be assessed by comparing available funding with budgets, and the ability to use financial resources can be assessed by comparing expenditures with available funding (TABLE 3.3; FIGURE 3.17; FIGURE 3.18). The latest year for which data are available for all three indicators is 2007. In 2007, Bangladesh, Ethiopia, India and Indonesia were the most successful of the HBCs in mobilizing funds for their budgets, while Afghanistan, Cambodia, Myanmar and Uganda were least successful (TABLE 3.3). Most HBCs reported spending a high proportion of their available funding, and in some cases the funds that were raised and spent exceeded the original budget (TABLE 3.3).[1] Three countries had expenditures that appeared to be particularly low relative to available funding: Bangladesh, Mozambique and Viet Nam. Review of the financial data reported by these

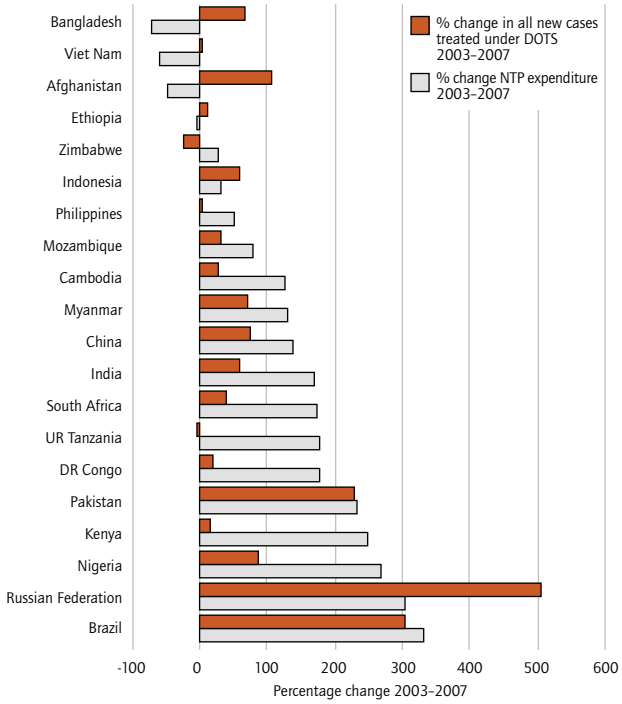
[1] This explains why the value of expenditures in 2007 as a percentage of the available funding prospectively reported in 2007 (final column of TABLE 3.3) exceeds 100.

TABLE 3.3
NTP budgets, available funding and expenditures (US$ millions), high-burden countries, 2007

	NTP BUDGET	AVAILABLE FUNDING[a]	EXPEN-DITURES[b]	AVAILABLE FUNDING AS % OF NTP BUDGET	EXPEN-DITURES AS % OF AVAILABLE FUNDING[c]
1 India	63	63	67	100	106
2 China	272	181	188	66	104
3 Indonesia	59	59	27	100	46
4 Nigeria	29	20	21	69	105
5 South Africa	378	–	–	–	–
6 Bangladesh	21	21	2.2	100	11
7 Ethiopia	8.9	8.9	8.2	100	92
8 Pakistan	29	18	10	62	55
9 Philippines	19	17	20	89	117
10 DR Congo	24	15	15	62	105
11 Russian Federation	1 078	846	991	78	117
12 Viet Nam	16	12	4.3	77	35
13 Kenya	29	18	18	63	97
14 Brazil	51	42	59	82	140
15 UR Tanzania	8.2	–	11	–	–
16 Uganda	11	4.2	–	38	–
17 Zimbabwe	3.9	2.6	2.2	68	83
18 Thailand	–	–	40	–	–
19 Mozambique	11	8.9	3.5	78	40
20 Myanmar	16	3.1	3.1	19	100
21 Cambodia	8.5	4.0	5.0	47	124
22 Afghanistan	14	3.2	2.2	22	71
High-burden countries	**2 151**	**1 347**	**1 498**	**70[d]**	**86[d]**

– Indicates not available.
[a] Based on budget data, reported prospectively in 2007.
[b] Based on actual expenditures, reported in 2008.
[c] Figures can be above 100% when additional funds were mobilized after reporting of data about budgets and sources of funding in 2007.
[d] Mean values.

FIGURE 3.18
Change in NTP expenditure and change in all types of patients treated under DOTS, 20 high-burden countries,[a,b,c] 2003–2007



[a] Countries ranked by percentage change in NTP expenditure.
[b] Expenditure data not available for Thailand and Uganda. Comparison for Kenya is between 2007 and 2004. For South Africa the comparison is between 2006 and 2005.
[c] Expenditure data for Afghanistan, Bangladesh and Viet Nam appear incomplete. See also FIGURE 3.9.

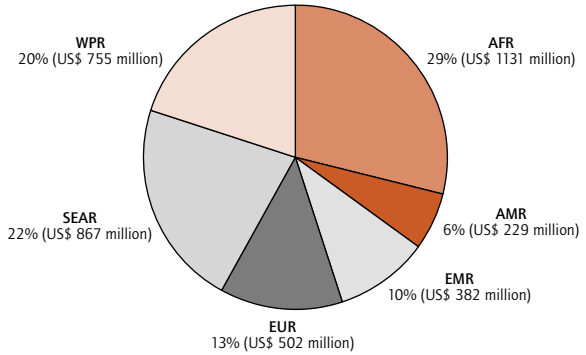
countries suggests that this reflects underreporting of expenditure data, at least in Bangladesh and Viet Nam (see also FIGURE 3.9).

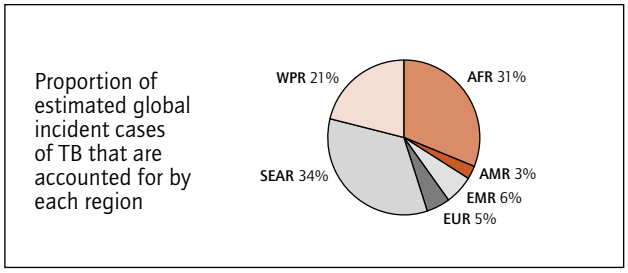
When country data for the HBCs are aggregated by region (FIGURE 3.17), the ability to mobilize resources was best in the South-East Asia Region and the Region of the Americas, and worst in the Eastern Mediterranean Region. The ability to spend available resources was best in the Western Pacific Region and the Region of the Americas. It appeared to be worst in the South-East Asia, but this finding is affected by apparent underreporting of expenditures in Bangladesh and a temporary cessation of funding from a Global Fund grant in Indonesia.

The ability to translate spending into an increased number of detected and treated patients can be assessed by comparing changes in expenditures 2003–2007 with changes in the number of TB patients treated in 2003–2007 (FIGURE 3.18; 2007 is the most recent year for which both case notification and expenditure data are available). Of the 20 HBCs for which data were available, all except one (the United Republic of Tanzania) of the 16 countries that increased spending between 2003 and 2007 also increased the number of new cases that were detected and treated in DOTS programmes (a similar relationship applied for new smear-positive cases specifically; data not shown). For the United Republic of Tanzania, the explanation may be that much of the increased expenditure was for collaborative TB/HIV activities, which (with the exception of intensified TB case-finding in people who are HIV-positive) are not expected to increase the number of cases detected and treated in DOTS programmes.

The relationship between increased expenditure and changes in the total number of patients treated was, however, variable. In Brazil, Indonesia, Pakistan and the Russian Federation, the increase in the number of patients treated under DOTS exceeded or approached the increase in expenditures. In Brazil and the Russian Federation, increasing the number of cases treated under DOTS should be easier than in other countries, since it requires mainly a substitution of DOTS for non-DOTS treatment rather than an increase in total case notifications. There was an almost one-to-one relationship between increased expenditures and increased notifications of new cases under DOTS in Pakistan. At the other end of the spectrum, four countries (Afghanistan, Bangladesh, Ethiopia and Viet Nam) reported lower expenditures in 2007 compared with 2003, although none of these countries reported a fall in the number of cases treated. While the data

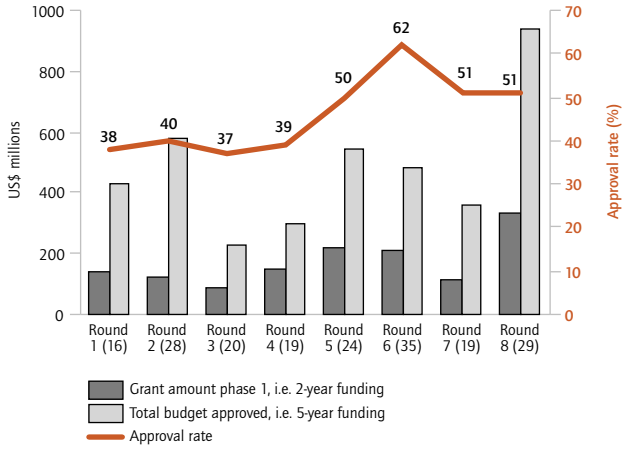
FIGURE 3.19
Global Fund commitments for TB control by region, as of end 2008[a]





[a] Refers to the total budgets approved in rounds 1–8.

FIGURE 3.20
Global Fund commitments and proposal approval rate by round. Numbers under bars show the number of TB proposals approved in each round.



are plausible for Ethiopia (given high investments in 2003), it seems likely that expenditures have been underreported in the other three countries.

3.7 Global Fund financing

3.7.1 High-burden countries

After eight rounds of proposals, the total value of approved proposals in the HBCs is US$ 2.3 billion; the amounts in the Phase 1 grant agreements (that is, for grants covering the first two years of the proposal) total US$ 632 million (data not shown). The Global Fund is the single most important source of external financing in HBCs (65% of total grant financing); seven countries (Afghanistan, Bangladesh, Cambodia, Nigeria, the Philippines, Uganda and Viet Nam) rely on grants from the Global Fund to finance more than 25% of their NTP budgets. Only Myanmar does not have a Global Fund grant.

By the end of 2008, US$ 719 million had been disbursed. Across all grants and countries, the actual disbursement rate is very similar to the expected rate,[1] although there is variation among countries. Disbursements were higher than expected in 16 out of 56 grants, similar to what is expected in six grants and less than expected in 34 grants (data not shown). Countries for which disbursements are particularly low in relation to the expected disbursement of funds include Bangladesh (round 5), India (round 3), Indonesia (round 5, probably linked to a temporary cessation of funding in 2007), Kenya (round 2) and Uganda (round 6).

3.7.2 All countries

In eight funding rounds between 2002 and 2008, the Global Fund approved proposals worth a total of US$ 3.9 billion for TB control in 102 countries, out of total commitments for HIV, TB and malaria of around US$ 15 billion.[2] The African Region has the single largest share of grants for TB control, at 29% (FIGURE 3.19), which is similar to its share of the global burden of TB (31%). The South-East Asia and Western Pacific regions have the second and third highest funding in absolute terms, but less than might be expected given their share of the global burden of TB (42% of total funding compared with 55% of estimated cases). The share of total funding approved for the Eastern Mediterranean Region, the European Region and the Region of the Americas (10%, 13% and 6% respectively) is much higher than these regions' share of the global burden of TB (6%, 5% and 3%).

The value of approved proposals for TB control was highest in absolute terms in round 8 and relatively high in rounds 2, 5 and 6 (FIGURE 3.20). The percentage of proposals that were approved was highest in round 6, at 62%.[3]

[1] The expected rate assumes that disbursements are spread evenly over the two- or five-year period of the grant agreement following the programme start date.
[2] The Global Fund has committed US$ 15.2 billion in rounds 1–8 for HIV, TB and malaria; grant agreements worth US$ 10.3 billion have been signed and US$ 7.2 billion has been disbursed. See www.theglobalfund.org/en/commitmentsdisbursements.
[3] Calculated as the number of proposals approved divided by the number of proposals reviewed by the Global Fund's Technical Review Panel.

An analysis of the components of TB control for which countries requested funding in rounds 6 to 8 is presented in BOX 3.2.

3.8 Funding gaps and the global financial crisis

The global financial crisis that developed in 2008 has been followed by either a halt to economic growth or an economic recession in most of the world's biggest economies, including the United States, Japan, Germany, the United Kingdom, Italy, Spain and the European Union as a whole. The International Monetary Fund has predicted that the global economy will grow by just 0.5% in 2009 (compared with 3.4% in 2008), its lowest rate for 60 years.[1] The consequences of economic slowdown and recession will be widespread, and the likely implications for global health are already being debated.[2,3] The consequences for financing of TB control specifically are unpredictable, but while funding in 2009 is slightly higher than in previous years, funding gaps are likely to become more difficult to fill. In the next 2–3 years, the WHO financial monitoring system set up in 2002 will allow changes in the total level of funding as well as sources of funding in the aftermath of the global financial crisis to be identified.

The 22 HBCs have reported a combined funding gap for TB control in the range of US$ 0.5–0.7 billion in 2009, while the funding gap reported for 111 countries (the 22 HBCs plus 89 other countries) amounts to US$ 0.9–1.1 billion in 2009. The main options for filling these funding gaps are (i) increasing the number and size of grants awarded for TB control by the Global Fund and other major donors and (ii) an increase in domestic funding.

There does appear to be potential to increase grants from the Global Fund. The US$ 3.9 billion committed thus far for TB control (SECTION 3.7) represents 25% of total commitments to date. If funds were split evenly among the three global health priorities supported by the Global Fund (AIDS, TB and malaria), grants for TB control would be US$ 5.0 billion, or US$1.1 billion more than their existing level. With commitments currently spread over 11 years, this would be equivalent to around US$ 460 million per year, instead of the current value of approximately US$ 350 million per year.

An increase in financing for TB control from the Global Fund to US$ 500 million per year would reduce but certainly not eliminate the funding gaps that have been reported. However, if funding gaps in four middle-income countries with greater domestic resources (Brazil, China, the Russian Federation and South Africa) are excluded, the gaps reported by HBCs fall to about US$ 200 million in 2009. In the

[1] *IMF Survey Magazine* [Online magazine] (available at http://www.imf.org/external/pubs/ft/survey/so/2009/res012809a.htm; accessed February 2009).

[2] *The Financial Crisis and Global Health. Report of a High-Level Consultation, World Health Organization, Geneva, 19 January 2009* [Information Note 2009/1]. Geneva, World Health Organization, 2009 (available athttp://www.who.int/mediacentre/events/meetings/2009_financial_crisis_report_en_.pdf; accessed February 2009).

[3] The global financial crisis: an acute threat to health. *Lancet*, 2009, 373:355–356.

BOX 3.2

Funding requested from the Global Fund in rounds 6 to 8

The Global Fund issued eight calls for proposals between 2002 and 2008. For rounds 6–8, it is possible to analyse the components of TB control for which countries sought funds according to the major components of the Stop TB Strategy.

In rounds 6–8, the Global Fund approved 85 TB proposals. Most of the funding that was approved was for DOTS (56%), which was defined to include programme management and supervision, laboratory strengthening, training, patient support, human resource development, first-line drugs and monitoring and evaluation. In round 8, there was a clear increase in the total funds approved for DOTS compared with previous rounds. This increase was mainly accounted for by increased funding for laboratory strengthening and an increase in the expected number of patients to be treated in DOTS programmes. Management of MDR-TB, including coordination activities, second-line drugs and laboratory strengthening specific to the diagnosis of drug resistance, was the second largest component (20%). The funds approved for MDR-TB increased steadily in absolute terms between round 6 and round 8, linked to an increase in the planned number of patients to be treated for MDR-TB. ACSM and community-based TB care accounted for 11% of requested funding in rounds 6 to 8.

The remaining funding that was approved in rounds 6 to 8 was accounted for by health system strengthening, including the Practical Approach to Lung Health (5%), activities to control TB in high-risk populations and infection control (4%), collaborative TB/HIV activities (3%) and activities to engage all care providers (1%). Although it is likely that some of the costs for public–private mix initiatives are included under other headings (such as first-line drugs and programme management), the amount appears surprisingly small given the need to ensure that all providers diagnose and treat TB patients according to the International Standards for Tuberculosis Care. A possible explanation for the small amount of funding requested for collaborative TB/HIV activities is that funds were requested mainly for coordination activities, while the funds for interventions such as CPT and ART are requested via HIV proposals. In future, the funding requested for infection control is expected to increase, linked to new policy guidance.

TABLE 3.4
Financial indicators,[a] high-burden countries, 2009

	NTP BUDGET PER CAPITA (US$)	TOTAL TB CONTROL COSTS PER CAPITA (US$)	FUNDING GAP PER CAPITA (US$)	GOVERNMENT EXPENDITURE ON HEALTH PER CAPITA (US$)[b]	TOTAL EXPENDITURE ON HEALTH PER CAPITA (US$)[b]	GOVERNMENT HEALTH SPENDING USED FOR TB CONTROL (%)[c]	TB GAP AS PERCENTAGE OF GENERAL GOVERNMENT HEALTH SPENDING[c]
1 India	0.08	0.1	0.02	6.8	36	1.8	0.4
2 China	0.2	0.2	0.01	31	81	0.5	0.02
3 Indonesia	0.3	0.4	0.1	12	26	3.2	0.6
4 Nigeria	0.3	0.4	0.1	8.4	27	4.6	1.6
5 South Africa	7.2	12.3	–	182	437	–	–
6 Bangladesh	0.1	0.1	0.001	3.4	12	4.0	0.02
7 Ethiopia	0.3	0.4	0.2	3.9	6.4	11	5.9
8 Pakistan	0.3	0.3	0.1	2.5	15	14	6.3
9 Philippines	0.2	0.4	0.05	14	37	2.9	0.4
10 DR Congo	0.8	1.0	0.6	1.7	5.0	64	37
11 Russian Federation	8.9	9.0	1.6	171	277	5.2	0.9
12 Viet Nam	0.1	0.3	0	9.6	38	3.3	0
13 Kenya	0.9	1.1	0.4	11	24	11	3.7
14 Brazil	0.3	0.5	0.1	164	371	0.3	0.04
15 UR Tanzania	0.6	0.7	0.2	9.5	17	7.9	2.0
16 Uganda	0.5	0.6	0.3	6.4	22	9.9	5.8
17 Zimbabwe	1.3	1.6	0.7	9.2	21	18	7.8
18 Thailand	0.8	0.8	0.05	63	98	1.3	0.1
19 Mozambique	1.1	1.4	0.3	9.2	15	16	3.2
20 Myanmar	0.2	0.3	0.1	0.4	4.0	62	21
21 Cambodia	0.7	0.9	0.3	6.9	29	14	3.9
22 Afghanistan	0.3	0.4	0.01	4.0	20	11	0.3
High-burden countries (mean value)	**1.2**	**1.5**	**0.2**	**33**	**73**	**13**	**4.8**

– Indicates not available.
[a] For definition of how financial indicators are calculated see ANNEX 2. Data for South Africa are for 2008.
[b] Latest data available are for 2005. Source: *National health accounts* [online database]. Geneva, World Health Organization, 2008.
[c] The indicators in these columns will be overestimates if government health expenditure has increased since 2005. Furthermore, there is uncertainty around the denominator used to calculate these indicators.

89 non-HBCs that reported data, funding gaps amount to US$ 120 million in 2009 (instead of US$ 423 million) when upper middle-income countries (defined as those with a GNI per capita of ≥US$ 3706) are excluded. Filling funding gaps via the Global Fund appears much more feasible in this context, but still depends on (i) the submission of high-quality and sufficiently ambitious proposals including well-justified budgets and (ii) the criteria used to determine which countries are eligible to apply for funding.

While funding gaps currently identified by low and lower-middle income countries could in theory be closed via applications to the Global Fund, closing gaps in upper-middle income countries as well as the additional gap that will open up if all countries plan in line with the Global Plan will require other sources of funding. The two other major options are external resource mobilization from donors other than the Global Fund and an increase in domestic financing.

Besides grant funding from the Global Fund, the (United States) President's Emergency Plan for AIDS Relief is the other major source of donor funding for health. The plan supports HIV prevention, treatment and care, of which collaborative TB/HIV activities is one part, in most of the African HBCs as well as Viet Nam. With billions of dollars per year available through this plan, it is important that collaborative TB/HIV activities and related aspects of TB control (for example, laboratory strengthening) are supported as much as possible. UNITAID[1] is also a source of donor funding for TB diagnostics and anti-TB drugs. At the end of 2008, UNITAID had committed support for first-line and second-line anti-TB drugs in 66 countries up to 2011. This support includes funding for first-line anti-TB drugs provided through the Global Drug Facility (GDF) for 876 000 patients during the period 2007–2009 and for a further 4530 patients for the first two years of grants approved in round 6 of the Global Fund; funding for second-line anti-TB drugs for the treatment of 4716 patients with MDR-TB during 2007–2011; and funding for paediatric anti-TB drugs provided through the GDF for 750 000 patients during 2007–2010.

Increasing domestic financing for TB control would mean a major shift from trends during the period 2002–2009, when almost all of the increase in domestic funding among the 22 HBCs was accounted for by Brazil, China and the Russian Federation. Two ways to assess the extent to which countries can mobilize more domestic funds are (i) to compare the percent-

[1] http://www.unitaid.eu/

age of funding being provided from domestic sources with a country's national income (measured as GNI per capita) to assess differences between countries with similar income levels (FIGURE 3.12) and (ii) to compare costs and funding gaps per capita with total government health expenditure per capita (TABLE 3.4).

Comparing countries with similar income levels and a similar TB burden suggests that there is scope for increasing domestic funding in several countries, including Indonesia (compared with the Philippines), Pakistan (compared with India) and Kenya (compared with Viet Nam). Comparing costs and funding gaps per capita with government health expenditure suggests that the countries with the most capacity to fund TB control from domestic resources are Brazil, China and Thailand, followed by India, the Philippines, Indonesia and the Russian Federation. The countries with the least capacity to increase funding from domestic sources include the African countries (except South Africa) as well as Cambodia and Myanmar. Furthermore, much of the gap between the expectations set out in the Global Plan and existing country plans is accounted for by MDR-TB treatment in China and India. While affected by the global financial crisis, these countries' economies are still expected to grow by 6.75% and 5% respectively in 2009.[1]

3.9 Summary

The financial data reported to WHO in 2008 are the most complete since financial monitoring began in 2002, with more than 100 countries that collectively account for 93% of the world's estimated TB cases providing the entire budget and funding data that were requested. Expenditure data continue to be more challenging to report, but 92 countries submitted a complete report in 2008.

The data show that funding for TB control has increased year-on-year since 2002. Among 94 countries that reported complete data, which account for 93% of TB cases globally and which were among the 171 countries considered in the Global Plan, available funding reached US$ 3.0 billion in 2009. Most of this funding (87%) will be provided by national governments, with the remainder provided by the Global Fund (9%) and other donors (4%). Among the 22 HBCs in which 80% of incident cases of TB occur, a total of US$ 2.2 billion is available in 2009, a small increase of US$ 27 million compared with 2008 but substantially above the US$ 1.2 billion that was spent on TB control in 2002. Most of the increased funding in HBCs since 2002 has come from domestic funding in Brazil, China and the Russian Federation, and external financing from the Global Fund. Of the US$ 2.2 billion available in the 22 HBCs in 2009, 88% is from HBC governments, 8% (US$ 169 million) is from the Global Fund and 4% (US$ 94 million) is from grants from sources other than the Global Fund. The distribution of funding sources is strikingly different when the Russian Federation and South Africa are excluded: the government contribution to available funding drops to 70%, the Global Fund contribution increases to 19% and grants from sources besides the Global Fund account for 11%.

Despite the increase in funding for TB control that has occurred over the past eight years, large funding gaps remain. Countries have identified funding gaps of US$ 1.2 billion in 2009. The gap is larger still, at US$ 1.6 billion, when available funding is compared with the funding requirements for 2009 that were estimated in the Global Plan. To close these funding gaps, additional resources will need to be mobilized from domestic sources as well as donors. This will be a major challenge in the context of a global financial crisis.

[1] IMF Survey Magazine [Online magazine] (available at http://www.imf.org/external/pubs/ft/survey/so/2009/res012809a.htm; accessed February 2009).

Conclusions

The main purpose of WHO's annual report on global TB control is to provide a comprehensive and up-to-date assessment of the TB epidemic and progress in controlling the disease at global, regional and country levels, in the context of global targets set for 2015.

The latest estimates of the global burden of TB are that there were 9.3 million incident cases of TB and 13.7 million prevalent cases of TB in 2007. There were also 1.3 million deaths from TB among HIV-negative people in 2007, and an additional 456 000 deaths among HIV-positive TB cases – equivalent to 23% of the total deaths attributed to HIV. The number of incident cases is increasing slowly in absolute terms due to population growth, with 86% of incident cases in Africa and Asia. Nonetheless, the number of incident cases per capita is falling slowly, both globally (with a rate of decline of less than 1% per year) and in all six WHO regions except the European Region (where rates are approximately stable). Incidence rates appear to have peaked globally in 2004, and if this is confirmed by further monitoring MDG Target 6.c – to halt and reverse incidence by 2015 – will have been achieved ten years ahead of the target date. Prevalence and mortality rates are also falling globally and in all six WHO regions. At least three of the six WHO regions – the Eastern Mediterranean and South-East Asia regions as well as the Region of the Americas – are on track to achieve the Stop TB Partnership's targets of halving prevalence and mortality rates by 2015 compared with their level in 1990. The Western Pacific Region is on track to halve the prevalence rate by 2015, but the mortality target may be narrowly missed. The African and European regions are far from achieving both targets, and for this reason it is unlikely that 1990 prevalence and death rates will be halved by 2015 for the world as a whole.

The Stop TB Strategy is WHO's recommended approach to reducing the burden of TB in line with global targets; the Stop TB Partnership's Global Plan to Stop TB has set out the scale at which the interventions included in the strategy need to be implemented in each year 2006 to 2015.

To date, DOTS is the component of the strategy that is most widely implemented and for which progress is closest to the milestones included in the Global Plan. In 2007, 5.5 million cases were notified by DOTS programmes, including 2.6 million new smear-positive cases. This is equivalent to a case detection rate of 63%, 7% short of the WHA target of detecting at least 70% of incident cases of smear-positive TB and 5% less than the Global Plan milestone of 68% for 2007. In 2006, 85% of the new smear-positive TB patients that were detected by DOTS programmes were successfully treated, exactly meeting the second WHA target. There has also been progress in scaling up collaborative TB/HIV activities, especially in the African Region. Globally, 1 million TB patients (16% of notified cases) knew their HIV status in 2007, including 37% of notified cases in the African Region. Of the 250 000 TB patients who were known to be HIV-positive in Africa, 0.2 million were enrolled on CPT and 0.1 million were started on ART. Just under 30 000 cases of MDR-TB were notified to WHO in 2007, mostly by European countries and South Africa, and the number of cases of MDR-TB diagnosed and treated according to international guidelines is expected to increase to 14 000 in 2009. Even so, the implementation of collaborative TB/HIV activities falls short of milestones set in the Global Plan, and the expansion of diagnosis and treatment of MDR-TB falls far short of Global Plan milestones, notably in the three countries where almost 60% of the world's 0.5 million estimated cases of MDR-TB occur: China, India and the Russian Federation.

The extent to which other components of the Stop TB Strategy are being implemented is less well understood, because to date progress is more difficult to quantify. However, the integration of diagnosis and treatment into primary health care in most countries, reported alignment of strategic planning for TB control with broader health sector planning frameworks, examples of how public-private mix initiatives can contribute to increased case detection in countries such as Pakistan and the Philippines, and increased attention to advocacy, communication and social mobilization are encouraging.

Despite reductions in the global burden of TB, an estimated 37% of cases of smear-positive TB are not being treated in DOTS programmes; more than 90% of incident cases of MDR-TB are not being diagnosed and treated according to international guidelines; the majority of HIV-positive TB cases do not know their HIV status; and the majority of HIV-positive TB patients who do know their HIV status are not yet accessing ART. To accelerate progress in global TB control, these numbers need to be reduced using the range of interventions and approaches included in the Stop TB Strategy, with the necessary financial backing. In 2009, US$ 3 billion is available for TB control, which is US$ 1.2 billion less than countries' own estimates of their funding requirements and US$ 1.6 billion short of the funding required according to the Global Plan. Most of the extra funding required according to the Global Plan is for MDR-TB diagnosis and treatment in the South-East Asia and Western Pacific regions (mostly in India and China), and for DOTS and collaborative TB/HIV activities in Africa. In the context of a global financial crisis, closing these funding gaps will be a major challenge.

ANNEX 1

Profiles of high-burden countries

Afghanistan

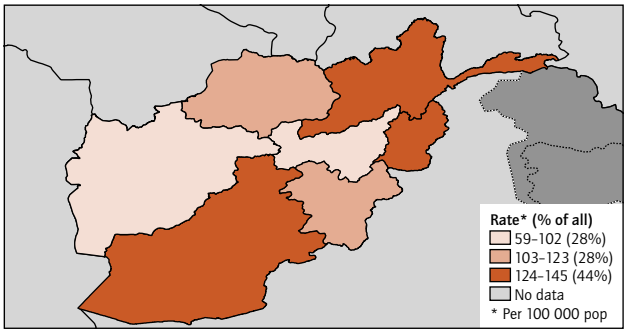
Despite a difficult situation on the ground, Afghanistan achieved a case detection rate of over 60% in 2007. The treatment success rate fell below 85% for the 2006 cohort after four years above the target. TB control services are an integral part of the package of services delivered through the primary health-care system at district and provincial levels. This package is implemented largely by NGOs; a network of partners has been developed at national and international levels to provide coordinated support to the NTP. The sustainability of activities is unclear, given the unstable security situation in many areas, particularly in the southern and south-eastern regions. The involvement of private practitioners has begun but needs to be expanded beyond pilot projects. Furthermore, several components of TB control have not yet been addressed, including the management of MDR-TB, the development of collaborative TB/HIV activities and the implementation of contact investigation.

SURVEILLANCE AND EPIDEMIOLOGY

Population (thousands)[a] 27 145

Estimates of epidemiological burden, 2007[b]	ALL	IN HIV+ PEOPLE
Incidence		
All forms of TB (thousands of new cases per year)	46	0
All forms of TB (new cases per 100 000 pop/year)	168	0
Rate of change in incidence rate (%), 2006–2007	**0**	–
New ss+ cases (thousands of new cases per year)	21	0
New ss+ cases (per 100 000 pop/year)	76	0
HIV+ incident TB cases (% of all TB cases)	0	–
Prevalence		
All forms of TB (thousands of cases)	65	0
All forms of TB (cases per 100 000 pop)	**238**	0
2015 target for prevalence (cases per 100 000 pop)	**218**	–
Mortality		
All forms of TB (thousands of deaths per year)	8.2	0
All forms of TB (deaths per 100 000 pop/year)	**30**	0
2015 target for mortality (deaths per 100 000 pop/year)	**25**	–
Multidrug-resistant TB (MDR-TB)		
MDR-TB among all new TB cases (%)	3.3	–
MDR-TB among previously treated TB cases (%)	36	–

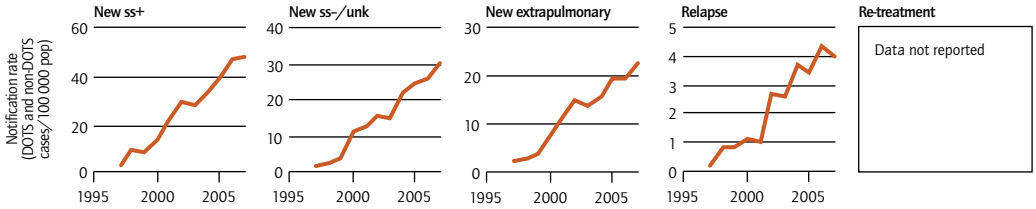
TB notification rate (new and relapse), 2007



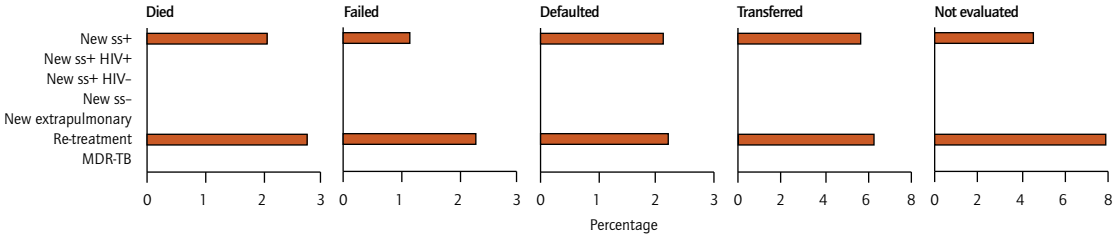
Total notifications, 2007

Notified new and relapse cases (thousands)	29
Notified new and relapse cases (per 100 000 pop/year)	106
Notified new ss+ cases (thousands)	13
Notified new ss+ cases (per 100 000 pop/year)	49
as % of new pulmonary cases	62
sex ratio (male/female)	0.5
DOTS case detection rate (% of estimated new ss+)	**64**
Notified new extrapulmonary cases (thousands)	6.2
as % of notified new cases	22
Notified new ss+ cases in children (<15 years) (thousands)	0.7
as % of notified new ss+ cases	5.0

Case notifications



Unfavourable treatment outcomes, 2006 cohorts



	2000	2001	2002	2003	2004	2005	2006	2007
DOTS coverage (%)	15	12	38	53	68	81	97	97
Notification rate (new & relapse cases/100 000 pop)	34	47	62	60	76	87	98	106
% notified new & relapse cases reported under DOTS	100	100	100	100	100	100	100	100
Notification rate (new ss+ cases/100 000 pop)	14	22	29	28	34	40	48	49
% notified new ss+ cases reported under DOTS	100	100	100	100	100	100	100	100
Case detection rate (all new cases, %)	20	28	35	34	43	50	55	61
Case detection rate (new ss+ cases, %)	18	29	39	37	45	52	63	64
Treatment success (new ss+ patients, %)	85	84	87	86	89	90	84	–
Re-treatment success (ss+ patients, %)	78	–	–	–	–	89	79	–

Note: notification, case detection and treatment success rates are for the whole country (i.e. DOTS and non-DOTS cases combined).

DOTS EXPANSION AND ENHANCEMENT

Overview of services for diagnosis of TB and treatment of patients

Description of basic management unit	Regional hospital, provincial hospital, district hospital, comprehensive health centre, basic health centre
Number of units (DOTS/total), 2007	991/991
Location of NTP services	
Rural	District hospital, comprehensive health centre, basic health centre
Urban	Regional hospital, provincial hospital, professional hospital
NTP services part of general primary health-care network?	Yes
Location where TB diagnosed	
Rural	District hospital, comprehensive health centre, basic health centre
Urban	Regional hospital, provincial hospital, professional hospital
Diagnosis free of charge?	Yes (all suspects)
Treatment supervised?	All patients in all units
Intensive phase	Health-care worker, community member, family member
Continuation phase	Health-care worker, community member, family member
Category I regimen	2(HR)ZE/6(HE)
Treatment free of charge?	All patients in all units
External review missions	last: 2007
	next: 2009

Political commitment

National strategic plan?	Yes (2009–2013)
Mechanism for national interagency coordination?	Yes (established 2003)
National Stop TB Partnership?	Yes (established 2008)

Financial indicators, 2009

(see final page for detailed presentation)	%
Government contribution to NTP budget (incl loans)	1.7
Government contribution to total cost TB control (incl loans)	12
Government health spending used for TB control	11
NTP budget funded	97

Per capita health financial indicators, 2009

	US$
NTP budget per capita	0.3
Total costs for TB control per capita	0.4
Funding gap per capita	0.01
Government health expenditure per capita (2005)	4.0
Total health expenditure per capita (2005)	20

Quality-assured bacteriology

National reference laboratory?	Yes

All TB laboratories performing EQA of smear microscopy or DST under the supervision of the National Reference Laboratory

	Smear				Culture		DST			
	Number	per 100 000	EQA	% adeq perf	Number	per 5 000 000	Number	per 10 000 000	EQA	% adeq perf
2007	500	1.8	360	86%	1	0.2	–	–	–	–
2008	545	1.9	545	71%	1	0.2	–	–	–	–

Note: for routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extra-pulmonary and ss–/HIV+ TB, as well as DST of re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population. EQA column shows number of laboratories for which EQA was done. Adeq perf; adequate performance for microscopy based on results of EQA.

System for managing drug supplies and laboratory equipment

	Central level			Peripheral level		
	2005	2006	2007	2005	2006	2007
Stock-outs of laboratory supplies?	–	No	No	–	No	No
Stock-outs of first-line anti-TB drugs?	No	No	Yes	No	No	No

Monitoring and evaluation system, and impact measurement

NTP publishes annual report?	Yes (since 2005)
% of BMUs reporting to next level in 2007	
Case-finding	100%
Treatment outcomes	100%

Burden and impact assessment		last	next
In-depth analysis of routine surveillance data	No	–	–
Prevalence of disease survey	No	–	–
Prevalence of infection survey	No	–	–
Drug resistance survey	Yes, national	–	2010
Mortality survey	No	–	–
Analysis of vital registration data	No	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES

Multidrug-resistant TB (MDR-TB)

	2005	2006	2007
	Number (% of estimated ss+ MDR-TB)		
Estimated incidence of ss+ MDR cases	1 266	1 318	1 371
Diagnosed and notified	– (–%)	– (–%)	– (–%)
Registered for treatment	– (–%)	– (–%)	– (–%)
GLC	0	0	0
non-GLC	–	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES (*continued*)

Detection and treatment of HIV in TB patients, 2007

TB patients for whom the HIV test result was known	–
as % of all notified TB patients	0
TB patients with positive HIV test	0
as % of all estimated HIV+ TB cases	–
HIV+ TB patients started or continued on CPT	–
as % of HIV+ TB patients notified	–
HIV+ TB patients started or continued on ART	–
as % of HIV+ TB patients notified	–

Screening for TB in HIV-positive patients, 2007

HIV+ patients in HIV care or ART register	0
Screened for TB	–
as % of HIV+ patients in HIV care or ART register	–
Started on TB treatment	–
as % of HIV+ patients in HIV care or ART register	–
Started on IPT	–
as % of HIV+ patients without TB in HIV care or ART register	–

High-risk groups, 2007

Number of close contacts of ss+ TB patients screened	–
Number of TB cases identified among contacts	–
% of contacts with TB	–
Contacts started on IPT	–
% of contacts without TB on IPT	–

HIV testing for TB patients

Data not reported

CPT and ART for HIV-positive TB patients

Data not reported

CONTRIBUTING TO HEALTH SYSTEM STRENGTHENING

Lack of basic infrastructure, scarce human resources and security problems are formidable challenges to strengthening health systems that also affect TB control. The NTP is addressing these challenges jointly with other stakeholders by aligning its planning and implementation processes with other planning processes, including the national plan for human resources for health and the general health-sector development plan. The NTP, which is implemented mostly through contracted NGOs as part of an integrated package of primary health care, is also developing approaches to use the private sector to implement public health interventions.

Practical Approach to Lung Health (PAL), 2007

Number of health-care facilities providing PAL services	0	As % of total number of health-care facilities	0

ENGAGING ALL CARE PROVIDERS

Public-public and public-private approaches (PPM), 2007

Number of providers collaborating with the NTP[c]

	Number collaborating (total number of providers)	% total notified TB Diagnosed	Treated
Public sector	3 (–)	0.8	0.8
Private sector	2 (–)	2.7	2.7

International Standards for Tuberculosis Care (ISTC)

ISTC endorsed by professional organizations?	No
ISTC included in medical curriculum?	–

EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

Advocacy, communication and social mobilization (ACSM)

The NTP has integrated ACSM into the National Strategic Plan for TB Control. In 2007–2008, primary and secondary research was used to conduct a national situation analysis and the first National ACSM Strategy 2009–2013 was developed. Funding for ACSM activities, outlined in the national ACSM strategy, was secured through round 8 of the Global Fund. Developing national implementation capacity and social mobilization capacity in remote areas in a complex security situation are the major challenges to ACSM faced by the NTP.

Community participation in TB care and Patients' Charter

The NTP has involved Afghan communities in TB control through NGOs, community organizations and public sector community health workers who are involved in case detection, treatment support, counselling, follow-up and management of suspect TB cases in hard-to-access rural areas of the country. The NTP has also involved religious leaders in its awareness campaigns. Affected communities and TB patients participate in decision-making forums such as the country coordination mechanism and the Board of the national Stop TB Partnership. No data on use of the Patients' Charter were reported.

ENABLING AND PROMOTING RESEARCH

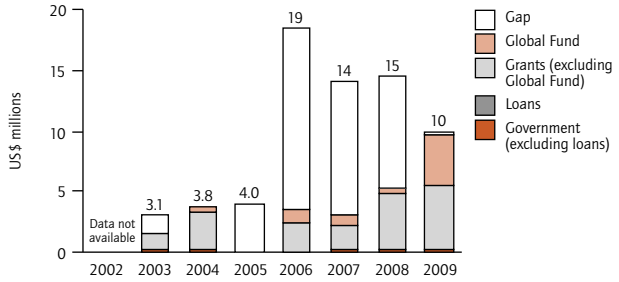
Programme-based operational research, 2007

Operational research budget (% of NTP budget)	14%

FINANCING

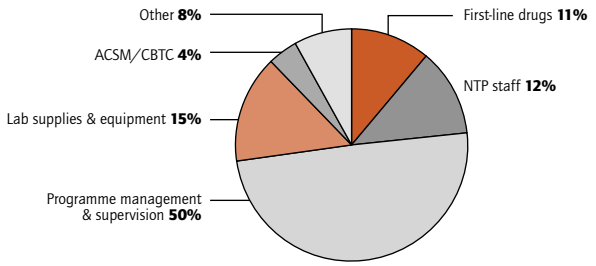
a. NTP budget by source of funding

Decreased budget requirement in 2009 is in line with revised strategic plan 2009–2013; greatly increased funding from Global Fund and other donors in 2009



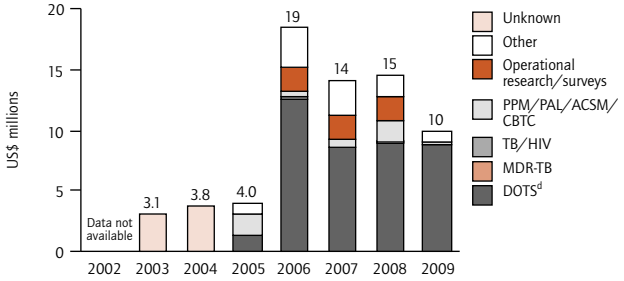
b. NTP budget line items in 2009

DOTS implementation accounts for 88% of the budget, with considerable investment in programme management and supervision



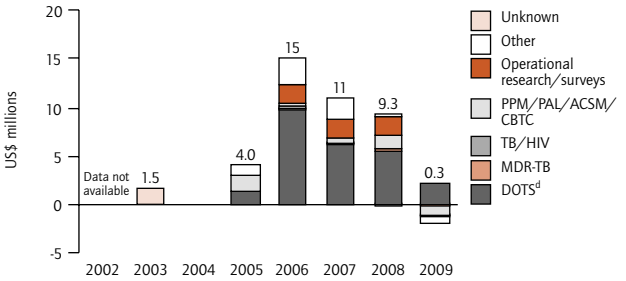
c. NTP budget by line item

Budget for operational research and community TB care reduced in 2009 following revision of strategic plan



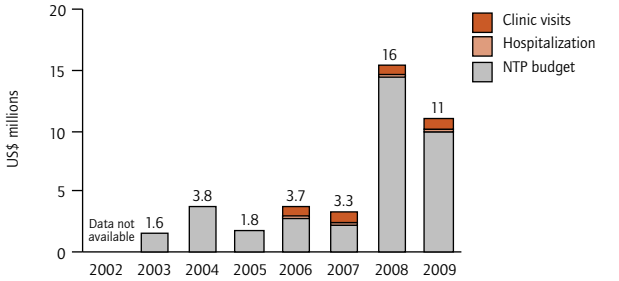
d. NTP funding gap by line item

Funding gaps within DOTS mainly for routine programme management, first-line drugs and laboratory supplies and equipment



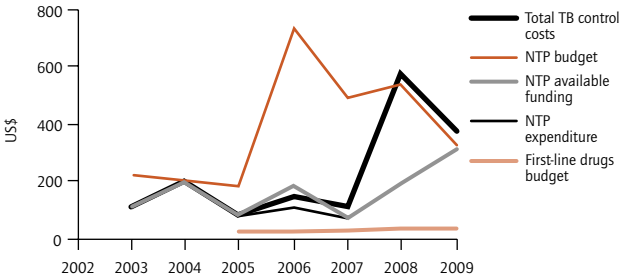
e. Total TB control costs by line item[1]

Hospitalization costs are for 200 TB beds; outpatient costs based on 71 visits per new ss+ TB patient during treatment and 68 visits per new ss– and extrapulmonary patients



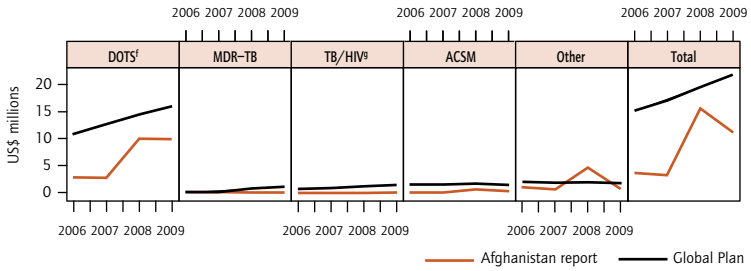
f. Per patient costs, budgets and expenditures[2]

Considerable fluctuation in all indicators but available funding per patient has risen since 2007



g. Global Plan compared with country reports[e]

Global Plan estimates of funding requirements are higher than country expenditures and projected funding requirements, mainly due to a higher forecast of patients to be treated in the Global Plan



h. NTP budget and funding gap by Stop TB Strategy component (US$ millions)

	2009 BUDGET	GAP
DOTS expansion and enhancement	8.8	2.2
TB/HIV, MDR-TB and other challenges	0	-0.1
Health system strengthening	0	0
Engage all care providers	0	-0.1
People with TB, and communities	0.4	-0.8
Research and surveys	0	-0.1
Other	0.8	-0.8

SOURCES, METHODS AND ABBREVIATIONS

[a–g] Please see footnotes page 169.

[1] Total TB control costs for 2003–2004 are based on available funding, whereas those for 2005–2007 are based on expenditure, and those for 2008–2009 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

[2] NTP available funding for 2005–2007 is based on the amount of funding actually received, using retrospective data; available funding for 2003–2004 and 2008–2009 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.

– indicates not available or not applicable; pop, population; ss+, sputum smear-positive; ss–, sputum smear-negative pulmonary; unk, pulmonary – sputum smear not done or result unknown.

Bangladesh

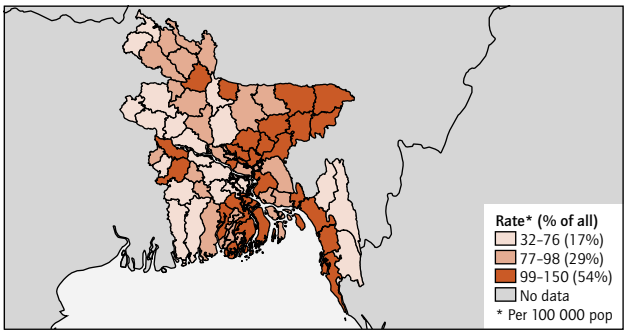
Bangladesh increased the case detection rate of new smear-positive cases to 66% in 2007 and has maintained a treatment success rate exceeding 90% since 2004. The provision of EQA has expanded to almost all peripheral-level laboratories. Support from the GDF has secured an uninterrupted supply of drugs. Community-based DOTS through village doctors (Damien Foundation) and community health volunteers (BRAC) ensures supervised drug intake. Programmatic guidelines for MDR-TB and TB/HIV were developed in 2008. The Damien Foundation expanded its MDR-TB treatment project and supported the development of a regional reference laboratory, and the NTP will soon begin enrolling patients in an MDR-TB treatment programme. Major challenges include limited capacity for diagnosis of smear-negative and extrapulmonary TB, and MDR-TB. Weak coordination among health-care providers is a major challenge for TB control in large urban areas.

SURVEILLANCE AND EPIDEMIOLOGY

Population (thousands)[a] 158 665

Estimates of epidemiological burden, 2007[b]	ALL	IN HIV+ PEOPLE
Incidence		
All forms of TB (thousands of new cases per year)	353	1.0
All forms of TB (new cases per 100 000 pop/year)	223	0.6
Rate of change in incidence rate (%), 2006–2007	**–1.0**	**0.1**
New ss+ cases (thousands of new cases per year)	159	0.3
New ss+ cases (per 100 000 pop/year)	100	0.2
HIV+ incident TB cases (% of all TB cases)	0.3	–
Prevalence		
All forms of TB (thousands of cases)	614	0.5
All forms of TB (cases per 100 000 pop)	**387**	0.3
2015 target for prevalence (cases per 100 000 pop)	**319**	–
Mortality		
All forms of TB (thousands of deaths per year)	71	0.4
All forms of TB (deaths per 100 000 pop/year)	**45**	0.3
2015 target for mortality (deaths per 100 000 pop/year)	**39**	–
Multidrug-resistant TB (MDR-TB)		
MDR-TB among all new TB cases (%)	3.5	–
MDR-TB among previously treated TB cases (%)	20	–

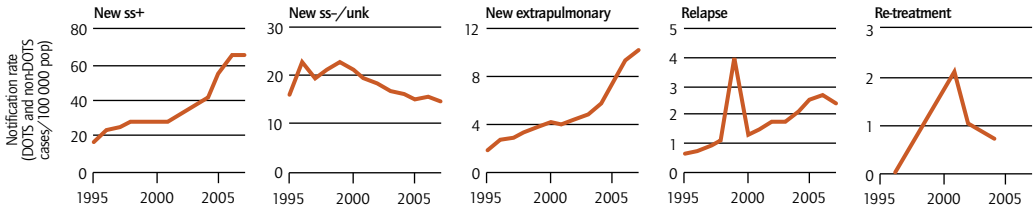
TB notification rate (new and relapse), 2007



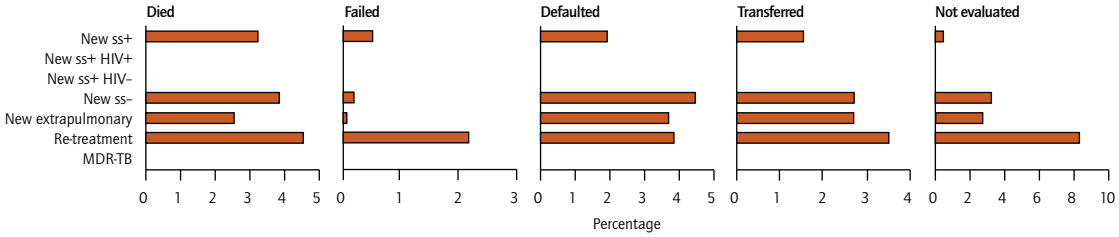
Total notifications, 2007

Notified new and relapse cases (thousands)	147
Notified new and relapse cases (per 100 000 pop/year)	93
Notified new ss+ cases (thousands)	104
Notified new ss+ cases (per 100 000 pop/year)	66
as % of new pulmonary cases	82
sex ratio (male/female)	2.0
DOTS case detection rate (% of estimated new ss+)	**66**
Notified new extrapulmonary cases (thousands)	16
as % of notified new cases	11
Notified new ss+ cases in children (<15 years) (thousands)	1.4
as % of notified new ss+ cases	1.3

Case notifications



Unfavourable treatment outcomes, 2006 cohorts



	2000	2001	2002	2003	2004	2005	2006	2007
DOTS coverage (%)	92	95	95	99	99	99	100	100
Notification rate (new & relapse cases/100 000 pop)	54	54	57	60	65	80	93	93
% notified new & relapse cases reported under DOTS	79	84	88	100	100	100	100	100
Notification rate (new ss+ cases/100 000 pop)	28	29	32	36	42	55	65	66
% notified new ss+ cases reported under DOTS	93	95	98	100	100	100	100	100
Case detection rate (all new cases, %)	22	22	23	25	28	34	40	41
Case detection rate (new ss+ cases, %)	26	27	31	35	40	54	65	66
Treatment success (new ss+ patients, %)	81	83	84	85	90	91	92	–
Re-treatment success (ss+ patients, %)	72	–	69	127	81	80	77	–

Note: notification, case detection and treatment success rates are for the whole country (i.e. DOTS and non-DOTS cases combined).

DOTS EXPANSION AND ENHANCEMENT

Overview of services for diagnosis of TB and treatment of patients

Description of basic management unit	Chest disease clinic, district Hospital
Number of units (DOTS/total), 2007	753/753
Location of NTP services	
Rural Upazilla Health Complex	
Urban Chest disease clinic, district hospital	
NTP services part of general primary health-care network?	Yes
Location where TB diagnosed	
Rural Upazilla Health Complex	
Urban Chest disease clinic, district hospital	
Diagnosis free of charge?	Yes (all suspects)
Treatment supervised?	All patients in all units
Intensive phase	Health-care worker, community member
Continuation phase	Health-care worker, community member
Category I regimen	2(HRZE)/4(HR)3
Treatment free of charge	All patients in all units
External review missions	last: 2007
	next: 2010

Political commitment

National strategic plan?	Yes (2006–2010)
Mechanism for national interagency coordination?	Yes (established –)
National Stop TB Partnership?	No (planned –)

Financial indicators, 2009

(see final page for detailed presentation)	%
Government contribution to NTP budget (incl loans)	39
Government contribution to total cost TB control (incl loans)	56
Government health spending used for TB control	4.2
NTP budget funded	99

Per capita health financial indicators, 2009

	US$
NTP budget per capita	0.1
Total costs for TB control per capita	0.1
Funding gap per capita	0.0006
Government health expenditure per capita (2005)	3.4
Total health expenditure per capita (2005)	12

Quality-assured bacteriology

National reference laboratory?	Yes

All TB laboratories performing EQA of smear microscopy or DST under the supervision of the National Reference Laboratory

	Smear				Culture		DST			
	Number	per 100 000	EQA	% adeq perf	Number	per 5 000 000	Number	per 10 000 000	EQA	% adeq perf
2007	753	0.5	753	88%	4	0.1	2	0.1	0	–
2008	753	0.5	753	–	4	0.1	2	0.1	0	–

Note: for routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extra-pulmonary and ss–/HIV+ TB, as well as DST of re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population. EQA column shows number of laboratories for which EQA was done. Adeq perf; adequate performance for microscopy based on results of EQA.

System for managing drug supplies and laboratory equipment

	Central level			Peripheral level		
	2005	2006	2007	2005	2006	2007
Stock-outs of laboratory supplies?	–	No	–	–	No	–
Stock-outs of first-line anti-TB drugs?	No	No	No	No	No	No

Monitoring and evaluation system, and impact measurement

NTP publishes annual report?	Yes (since –)
% of BMUs reporting to next level in 2007	
Case-finding	100%
Treatment outcomes	100%

Burden and impact assessment		last	next
In-depth analysis of routine surveillance data	No	–	–
Prevalence of disease survey	Yes, national	2007	–
Prevalence of infection survey	No	–	–
Drug resistance survey	–	–	2009
Mortality survey	No	–	–
Analysis of vital registration data	No	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES

Multidrug-resistant TB (MDR-TB)

	2005	2006	2007
	Number (% of estimated ss+ MDR-TB)		
Estimated incidence of ss+ MDR cases	7 583	7 640	7 694
Diagnosed and notified	– (–%)	– (–%)	– (–%)
Registered for treatment	– (–%)	– (–%)	– (–%)
GLC	0	0	0
non-GLC	–	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES (*continued*)

Detection and treatment of HIV in TB patients, 2007

TB patients for whom the HIV test result was known	–
as % of all notified TB patients	–
TB patients with positive HIV test	–
as % of all estimated HIV+ TB cases	–
HIV+ TB patients started or continued on CPT	–
as % of HIV+ TB patients notified	–
HIV+ TB patients started or continued on ART	–
as % of HIV+ TB patients notified	–

Screening for TB in HIV-positive patients, 2007

HIV+ patients in HIV care or ART register	–
Screened for TB	–
as % of HIV+ patients in HIV care or ART register	–
Started on TB treatment	–
as % of HIV+ patients in HIV care or ART register	–
Started on IPT	–
as % of HIV+ patients without TB in HIV care or ART register	–

High-risk groups, 2007

Number of close contacts of ss+ TB patients screened	–
Number of TB cases identified among contacts	–
% of contacts with TB	–
Contacts started on IPT	–
% of contacts without TB on IPT	–

HIV testing for TB patients

Data not reported

CPT and ART for HIV-positive TB patients

Data not reported

CONTRIBUTING TO HEALTH SYSTEM STRENGTHENING

The health-care system in the public sector is constrained by a lack of human resources, which affects access to TB services in rural areas. NGOs work in close collaboration with the government to provide essential primary health-care services, including integrated services to control TB, in many areas. TB control is well aligned with the national health plan, the SWAP and the Medium-term Expenditure Framework for health. The NTP is a leader in engaging informal health-care providers to provide public health services, including the use of "village doctors" to find TB cases and support anti-TB treatment.

Practical Approach to Lung Health (PAL), 2007

Number of health-care facilities providing PAL services	–	As % of total number of health-care facilities	–

ENGAGING ALL CARE PROVIDERS

Public-public and public-private approaches (PPM), 2007

Number of providers collaborating with the NTP[c]

	Number collaborating (total number of providers)	% total notified TB Diagnosed	Treated
Public sector	101 (–)	–	–
Private sector	2 455 (–)	–	–

International Standards for Tuberculosis Care (ISTC)

ISTC endorsed by professional organizations?	No
ISTC included in medical curriculum?	No

EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

Advocacy, communication and social mobilization (ACSM)

An ACSM consultant participated in the 2007 National Programme Review to assess progress and helped to draft recommendations for future ACSM activities. A KAP survey is planned for 2009, and the national ACSM strategy is being finalized.

Community participation in TB care and Patients' Charter

Community-based services are widely available in the country, primarily through two important NGOs that provide services in accordance with NTP policy. DOT in rural areas is provided through female community health volunteers (as part of a primary health-care package), village doctors, cured patients and community opinion-leaders. Activities to raise awareness among communities, identify suspected TB cases and trace defaulters are widely implemented. In urban areas, DOT is usually available at a health facility. No data on use of the Patients' Charter were reported.

ENABLING AND PROMOTING RESEARCH

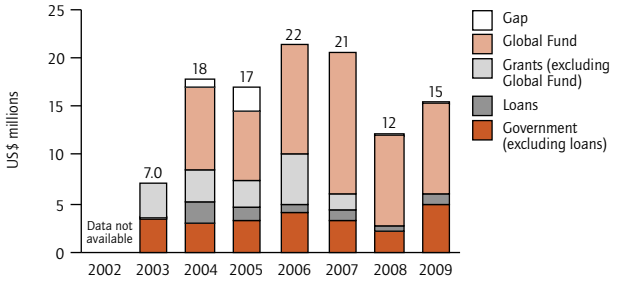
Programme-based operational research, 2007

Operational research budget (% of NTP budget)	0.7%

FINANCING

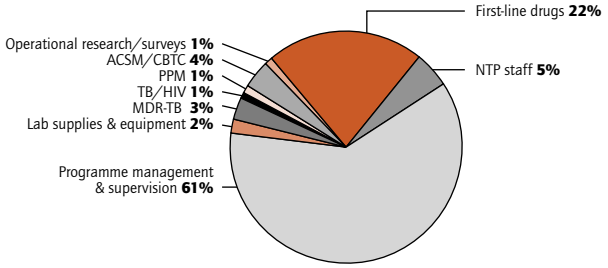
a. NTP budget by source of funding

Decreased budget in 2008 and 2009



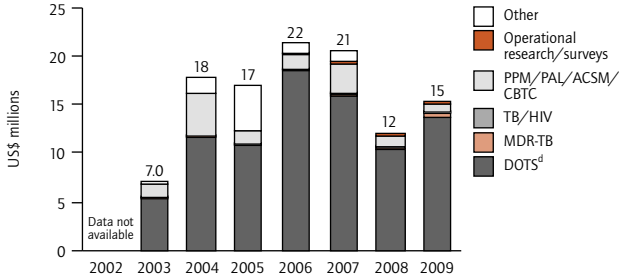
b. NTP budget line items in 2009

90% of budget is for DOTS, with a substantial share for programme management and supervision



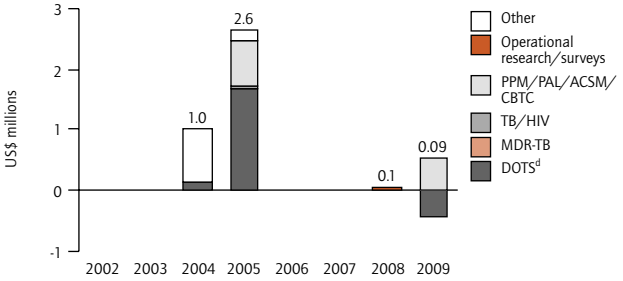
c. NTP budget by line item

Within DOTS, large decrease in budget for NTP staff in 2008



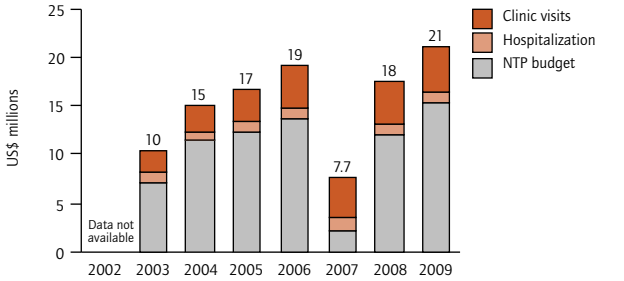
d. NTP funding gap by line item

Surplus within DOTS in 2009 mainly for laboratory supplies and equipment; funding gap within MDR-TB is for second-line drugs



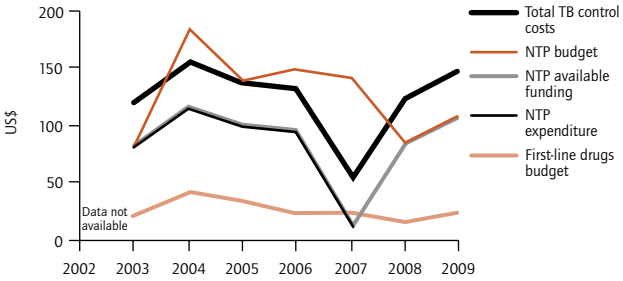
e. Total TB control costs by line item[1]

Hospitalization costs are for 696 dedicated TB beds; costs for clinic visits based on 27 visits per patient during treatment; NTP budget accounts for the largest share of TB control costs



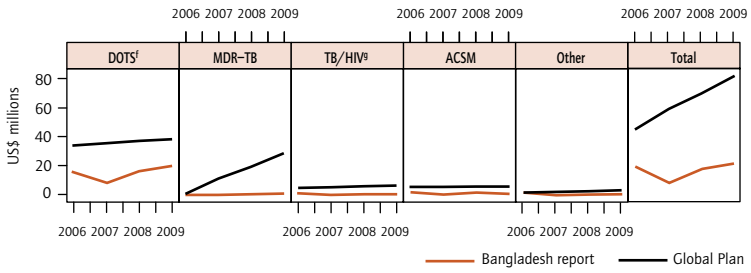
f. Per patient costs, budgets and expenditures[2]

Decreased total costs in 2007; expenditure data appear incomplete in 2007



g. Global Plan compared with country reports[e]

Country report not in line with Global Plan; targets for MDR-TB patients to be treated in Global MDR/XDR-TB Response Plan much higher than scaling-up planned by NTP



h. NTP budget and funding gap by Stop TB Strategy component (US$ millions)

	2009 BUDGET	GAP
DOTS expansion and enhancement	14	–0.4
TB/HIV, MDR-TB and other challenges	0.5	0
Health system strengthening	0	0
Engage all care providers	0.2	0
People with TB, and communities	0.5	0.5
Research and surveys	0.2	0
Other	0	0

SOURCES, METHODS AND ABBREVIATIONS

[a–g] Please see footnotes page 169.

[1] Total TB control costs for 2003–2007 are based on expenditure, whereas those for 2008–2009 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

[2] NTP available funding for 2004–2007 is based on the amount of funding actually received, using retrospective data; available funding for 2003 and 2008–2009 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.

– indicates not available or not applicable; pop, population; ss+, sputum smear-positive; ss–, sputum smear-negative pulmonary; unk, pulmonary – sputum smear not done or result unknown.

Brazil

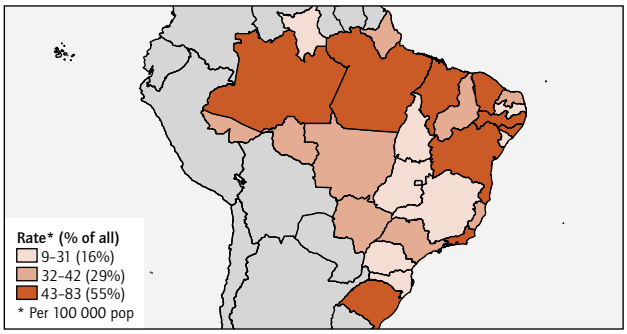
Government commitment to promoting social services has increased the visibility of TB as a public health problem, and funding for TB control has increased substantially in recent years. DOTS expansion has progressed and TB control activities have prioritized 315 of a total of 5565 municipalities accounting for 70% of the country's TB cases. TB services are integrated into the primary health-care system. The process of decentralizing TB control management to state and municipality levels is continuing. Collaborative TB/HIV activities have been implemented and scaled up. About 14% of the 72% of TB patients tested for HIV infection are found to be HIV-positive. Special initiatives to control TB in vulnerable groups such as indigenous populations and prisoners have been implemented in collaboration with relevant governmental organizations and NGOs. Despite the progress made in controlling TB, rates of case detection and treatment success are still below the global targets.

SURVEILLANCE AND EPIDEMIOLOGY

Population (thousands)[a] 191 791

Estimates of epidemiological burden, 2007[b]	ALL	IN HIV+ PEOPLE
Incidence		
All forms of TB (thousands of new cases per year)	92	13
All forms of TB (new cases per 100 000 pop/year)	48	6.8
Rate of change in incidence rate (%), 2006–2007	**–3.2**	**–2.8**
New ss+ cases (thousands of new cases per year)	49	5.9
New ss+ cases (per 100 000 pop/year)	26	3.1
HIV+ incident TB cases (% of all TB cases)	14	–
Prevalence		
All forms of TB (thousands of cases)	114	6.5
All forms of TB (cases per 100 000 pop)	**60**	3.4
2015 target for prevalence (cases per 100 000 pop)	**62**	–
Mortality		
All forms of TB (thousands of deaths per year)	8.4	2.5
All forms of TB (deaths per 100 000 pop/year)	**4.4**	1.3
2015 target for mortality (deaths per 100 000 pop/year)	**3.6**	–
Multidrug-resistant TB (MDR-TB)		
MDR-TB among all new TB cases (%)	0.9	–
MDR-TB among previously treated TB cases (%)	5.4	–

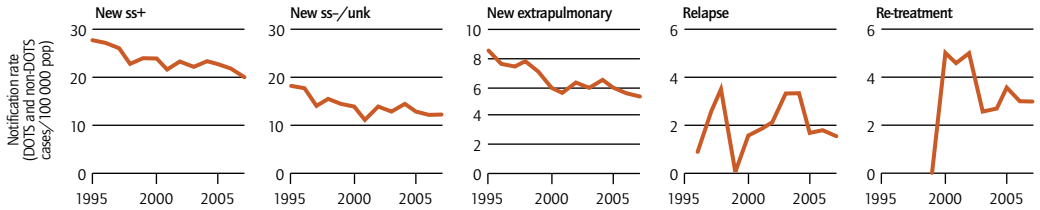
TB notification rate (new and relapse), 2007



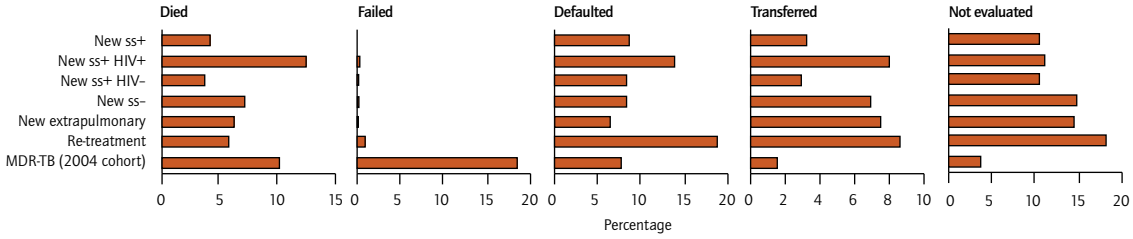
Total notifications, 2007

Notified new and relapse cases (thousands)	75
Notified new and relapse cases (per 100 000 pop/year)	39
Notified new ss+ cases (thousands)	38
Notified new ss+ cases (per 100 000 pop/year)	20
as % of new pulmonary cases	63
sex ratio (male/female)	2.1
DOTS case detection rate (% of estimated new ss+)	**69**
Notified new extrapulmonary cases (thousands)	10
as % of notified new cases	14
Notified new ss+ cases in children (<15 years) (thousands)	0.7
as % of notified new ss+ cases	1.9

Case notifications



Unfavourable treatment outcomes, 2006 cohorts



	2000	2001	2002	2003	2004	2005	2006	2007
DOTS coverage (%)	7.0	32	25	34	52	68	86	75
Notification rate (new & relapse cases/100 000 pop)	45	42	45	44	47	43	41	39
% notified new & relapse cases reported under DOTS	6.8	11	11	21	51	63	79	89
Notification rate (new ss+ cases/100 000 pop)	24	22	23	22	23	23	22	20
% notified new ss+ cases reported under DOTS	9.6	11	12	23	53	62	79	89
Case detection rate (all new cases, %)	72	65	77	74	83	81	79	78
Case detection rate (new ss+ cases, %)	73	70	76	75	82	82	82	78
Treatment success (new ss+ patients, %)	71	55	80	77	76	76	73	–
Re-treatment success (ss+ patients, %)	40	23	60	64	49	48	47	–

Note: notification, case detection and treatment success rates are for the whole country (i.e. DOTS and non-DOTS cases combined).

DOTS EXPANSION AND ENHANCEMENT

Overview of services for diagnosis of TB and treatment of patients

Description of basic management unit	Primary health-care units and hospitals
Number of units (DOTS/total), 2007	7411/9818
Location of NTP services	
Rural Primary health-care unit	
Urban Primary health-care units and hospitals	
NTP services part of general primary health-care network?	Yes
Location where TB diagnosed	
Rural Primary health-care unit	
Urban Primary health-care units and hospitals	
Diagnosis free of charge?	Yes (all suspects)
Treatment supervised?	Some patients in some units
Intensive phase	Health-care worker, community member, family member
Continuation phase	Health-care worker, community member, family member
Category I regimen	2(HR)ZE/4(HR)
Treatment free of charge	All patients in all units
External review missions	last: 2006
	next: 2009

Political commitment

National strategic plan?	Yes (2007–2015)
Mechanism for national interagency coordination?	Yes (established 2004)
National Stop TB Partnership?	Yes (established 2004)

Financial indicators, 2009

(see final page for detailed presentation)	%
Government contribution to NTP budget (incl loans)	80
Government contribution to total cost TB control (incl loans)	86
Government health spending used for TB control	0.3
NTP budget funded	82

Per capita health financial indicators, 2009

	US$
NTP budget per capita	0.3
Total costs for TB control per capita	0.5
Funding gap per capita	0.1
Government health expenditure per capita (2005)	164
Total health expenditure per capita (2005)	371

Quality-assured bacteriology

National reference laboratory?	Yes

All TB laboratories performing EQA of smear microscopy or DST under the supervision of the National Reference Laboratory

	Smear				Culture		DST			
	Number	per 100 000	EQA	% adeq perf	Number	per 5 000 000	Number	per 10 000 000	EQA	% adeq perf
2007	4 044	2.1	1 819	75%	193	5.0	38	2.0	17	82%
2008	4 044	2.1	2 022	–	232	0.6	38	2.0	27	–

Note: for routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extra-pulmonary and ss–/HIV+ TB, as well as DST of re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population. EQA column shows number of laboratories for which EQA was done. Adeq perf; adequate performance for microscopy based on results of EQA.

System for managing drug supplies and laboratory equipment

	Central level			Peripheral level		
	2005	2006	2007	2005	2006	2007
Stock-outs of laboratory supplies?	–	Yes	No	–	All units	No
Stock-outs of first-line anti-TB drugs?	–	No	No	No	No	No

Monitoring and evaluation system, and impact measurement

NTP publishes annual report?	No
% of BMUs reporting to next level in 2007	
Case-finding	100%
Treatment outcomes	100%

Burden and impact assessment		last	next
In-depth analysis of routine surveillance data	Yes	2008	2009
Prevalence of disease survey	No	–	–
Prevalence of infection survey	No	–	–
Drug resistance survey	Yes, sub-national	1996	Ongoing
Mortality survey	Yes	2006	2007
Analysis of vital registration data	Yes	2007	2008

MDR-TB, TB/HIV AND OTHER CHALLENGES

Multidrug-resistant TB (MDR-TB)

	2005	2006	2007
	Number (% of estimated ss+ MDR-TB)		
Estimated incidence of ss+ MDR cases	1 098	1 077	1 056
Diagnosed and notified	373 (34%)	399 (37%)	832 (79%)
Registered for treatment	347 (32%)	309 (29%)	321 (30%)
GLC	0	0	0
non-GLC	347	309	321

MDR-TB, TB/HIV AND OTHER CHALLENGES (*continued*)

Detection and treatment of HIV in TB patients, 2007

TB patients for whom the HIV test result was known	57 593
as % of all notified TB patients	72
TB patients with positive HIV test	8 141
as % of all estimated HIV+ TB cases	63
HIV+ TB patients started or continued on CPT	0
as % of HIV+ TB patients notified	0
HIV+ TB patients started or continued on ART	8 141
as % of HIV+ TB patients notified	100

Screening for TB in HIV-positive patients, 2007

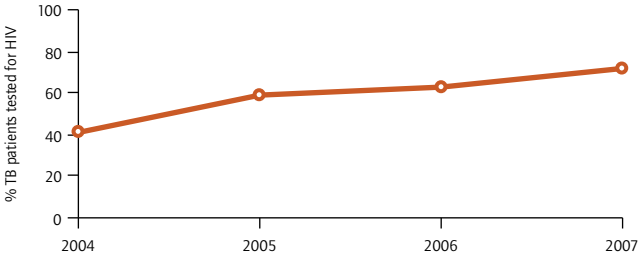
HIV+ patients in HIV care or ART register	–
Screened for TB	–
as % of HIV+ patients in HIV care or ART register	–
Started on TB treatment	–
as % of HIV+ patients in HIV care or ART register	–
Started on IPT	–
as % of HIV+ patients without TB in HIV care or ART register	–

High-risk groups, 2007

Number of close contacts of ss+ TB patients screened	–
Number of TB cases identified among contacts	–
% of contacts with TB	–
Contacts started on IPT	–
% of contacts without TB on IPT	–

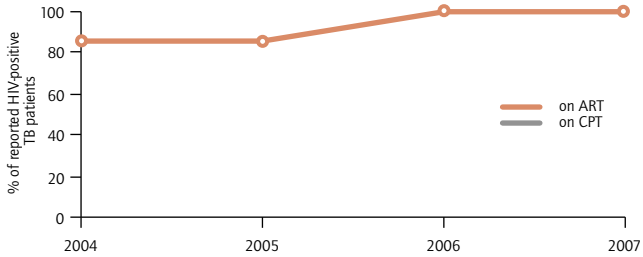
HIV testing for TB patients

The proportion of TB patients screened for HIV continues to increase



CPT and ART for HIV-positive TB patients

In 2006 and 2007, 100% of HIV-positive TB patients received ART. Data on provision of CPT are not recorded by the NTP



CONTRIBUTING TO HEALTH SYSTEM STRENGTHENING

The health-care system is relatively strong and there is an extensive and decentralized primary health-care infrastructure into which TB control is integrated. TB control is aligned with the general national health plan.

Practical Approach to Lung Health (PAL), 2007

Number of health-care facilities providing PAL services	–	As % of total number of health-care facilities	–

ENGAGING ALL CARE PROVIDERS

Public-public and public-private approaches (PPM), 2007

Number of providers collaborating with the NTP[c]

	Number collaborating (total number of providers)	% total notified TB Diagnosed	Treated
Public sector	– (–)	–	–
Private sector	– (–)	–	–

International Standards for Tuberculosis Care (ISTC)

ISTC endorsed by professional organizations?	Yes
By which organizations:	–
ISTC included in medical curriculum?	Yes

EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

Advocacy, communication and social mobilization (ACSM)

The NTP has a national ACSM strategy and is engaged in a wide range of ACSM activities. The Brazilian health system requires that municipalities and states have a health council comprising health professionals, managers and service users. There are six TB and 27 AIDS forums involved in increasing engagement with civil society. Activities with policy-makers and organizations working with drug users, the homeless and prison populations have been carried out to better engage these groups in TB control. In 2008, three national television and radio campaigns were broadcast to raise awareness about TB. A KAP survey was conducted in 2008.

Community participation in TB care and Patients' Charter

The NTP is engaging civil society and empowering communities by training staff in health councils on awareness about TB. These health councils, which operate at federal, state and municipal levels of government, are comprised of health professionals, managers and service users. The NTP is also engaging communities by strengthening the national Stop TB Partnership, encouraging TB NGOs to create state forums and financing a range of NGO projects.

ENABLING AND PROMOTING RESEARCH

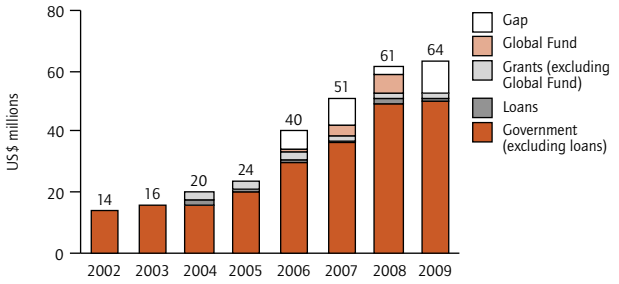
Programme-based operational research, 2007

Operational research budget (% of NTP budget)	5.7%

FINANCING

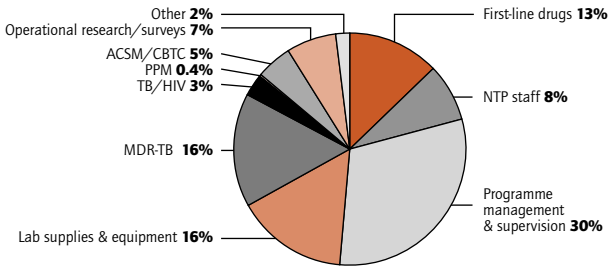
a. NTP budget by source of funding

NTP budget and government funding have more than tripled since 2002, demonstrating increased political commitment



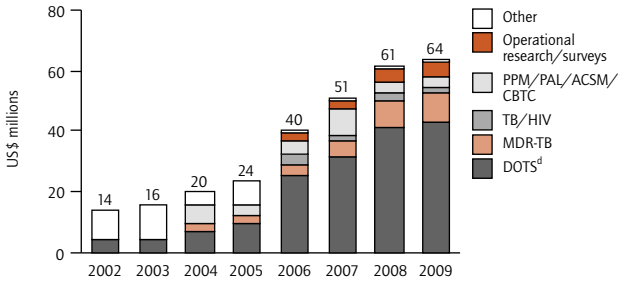
b. NTP budget line items in 2009

Most of the budget is for DOTS (67%) and MDR-TB (16%)



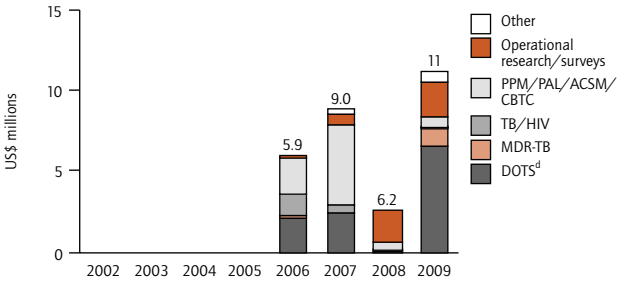
c. NTP budget by line item

Increased budget for routine programme management activities and MDR-TB



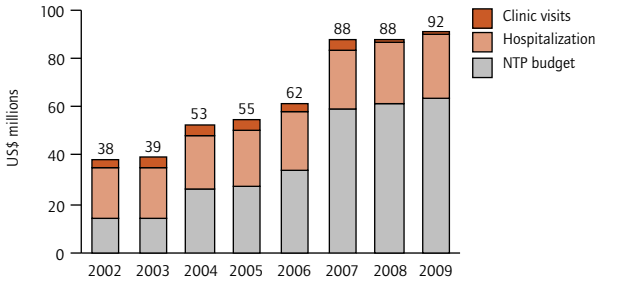
d. NTP funding gap by line item

Funding gap within DOTS mainly for routine programme management activities



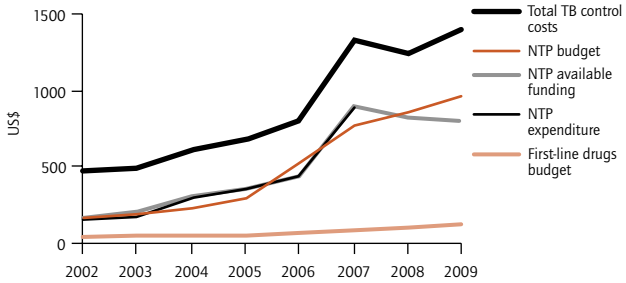
e. Total TB control costs by line item[1]

Hospitalization costs are for 2500 dedicated TB beds; costs for clinic visits based on 12 visits per patient in 2008 and 2009



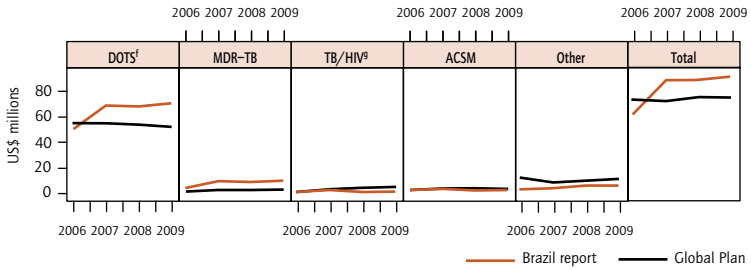
f. Per patient costs, budgets and expenditures[2]

Increasing cost per patient since 2002 as newer elements of TB control are introduced; increased expenditures in 2007



g. Global Plan compared with country reports[e]

Implemented (2006-2007) and planned (2008-2009) activities are consistent with or ahead of the Global Plan, except for PPM/PAL (in other)



h. NTP budget and funding gap by Stop TB Strategy component (US$ millions)

	2009 BUDGET	GAP
DOTS expansion and enhancement	43	6.7
TB/HIV, MDR-TB and other challenges	12	1.1
Health system strengthening	0.3	0.3
Engage all care providers	0.3	0.3
People with TB, and communities	3.0	0.1
Research and surveys	4.6	2.0
Other	0.9	0.8

SOURCES, METHODS AND ABBREVIATIONS

[a–g] Please see footnotes page 169.

[1] Total TB control costs for 2002–2007 are based on expenditure, whereas those for 2008–2009 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

[2] NTP available funding for 2004–2007 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003 and 2008–2009 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.

– indicates not available or not applicable; pop, population; ss+, sputum smear-positive; ss–, sputum smear-negative pulmonary; unk, pulmonary – sputum smear not done or result unknown.

Cambodia

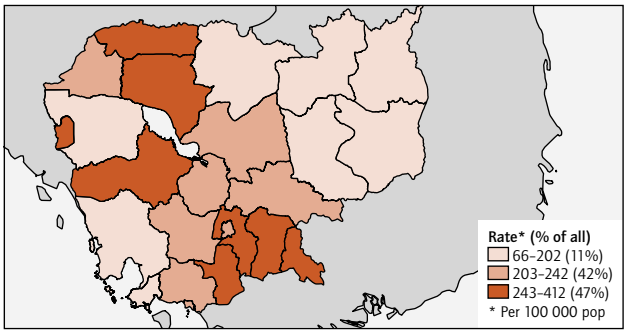
The NTP has sustained high treatment success rates of over 90% for more than a decade. Although the case detection rate is assessed to be less than 70%, the results of a recent national population census suggest that this target may have been achieved. In 2007, the NTP published a national strategic plan for the TB laboratory network and guidelines for diagnosis and treatment of TB in children. The third national seroprevalence survey showed a further decline in HIV prevalence among TB patients from 11.8% in 2003 to 7.8% in 2007. Collaborative TB/HIV activities and community-based DOTS have been further expanded. An MDR-TB project initiated by an NGO in partnership with the NTP has demonstrated the feasibility of expanding implementation to public sector facilities outside the capital. However, human resource capacity, and laboratory capacity to perform smear microscopy, culture, DST and new diagnostic technologies, remain major challenges.

SURVEILLANCE AND EPIDEMIOLOGY

Population (thousands)[a] 14 444

Estimates of epidemiological burden, 2007[b]	ALL	IN HIV+ PEOPLE
Incidence		
All forms of TB (thousands of new cases per year)	72	5.6
All forms of TB (new cases per 100 000 pop/year)	495	38
Rate of change in incidence rate (%), 2006–2007	**–1.0**	**–9.6**
New ss+ cases (thousands of new cases per year)	32	1.9
New ss+ cases (per 100 000 pop/year)	219	13
HIV+ incident TB cases (% of all TB cases)	7.8	–
Prevalence		
All forms of TB (thousands of cases)	96	2.8
All forms of TB (cases per 100 000 pop)	**664**	19
2015 target for prevalence (cases per 100 000 pop)	**464**	–
Mortality		
All forms of TB (thousands of deaths per year)	13	1.8
All forms of TB (deaths per 100 000 pop/year)	**89**	13
2015 target for mortality (deaths per 100 000 pop/year)	**60**	–
Multidrug-resistant TB (MDR-TB)		
MDR-TB among all new TB cases (%)	0	–
MDR-TB among previously treated TB cases (%)	3.1	–

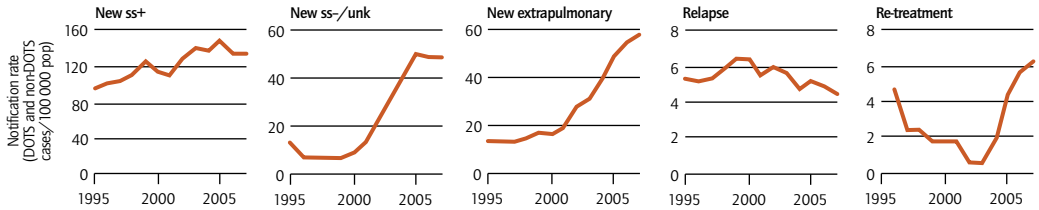
TB notification rate (new and relapse), 2007



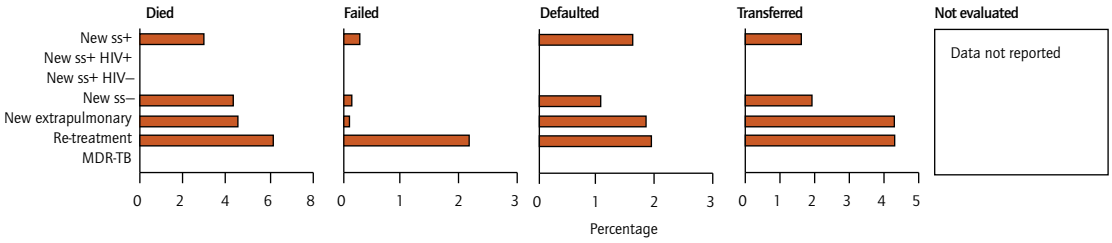
Total notifications, 2007

Notified new and relapse cases (thousands)	36
Notified new and relapse cases (per 100 000 pop/year)	246
Notified new ss+ cases (thousands)	19
Notified new ss+ cases (per 100 000 pop/year)	134
as % of new pulmonary cases	73
sex ratio (male/female)	1.1
DOTS case detection rate (% of estimated new ss+)	**61**
Notified new extrapulmonary cases (thousands)	8.4
as % of notified new cases	24
Notified new ss+ cases in children (<15 years) (thousands)	0.1
as % of notified new ss+ cases	0.6

Case notifications



Unfavourable treatment outcomes, 2006 cohorts



	2000	2001	2002	2003	2004	2005	2006	2007
DOTS coverage (%)	99	100	100	100	100	100	100	100
Notification rate (new & relapse cases/100 000 pop)	148	147	186	209	225	255	244	246
% notified new & relapse cases reported under DOTS	100	100	100	100	100	100	100	100
Notification rate (new ss+ cases/100 000 pop)	116	110	130	140	138	150	136	134
% notified new ss+ cases reported under DOTS	100	100	100	100	100	100	100	100
Case detection rate (all new cases, %)	27	27	35	40	43	49	48	49
Case detection rate (new ss+ cases, %)	50	48	57	62	62	68	62	61
Treatment success (new ss+ patients, %)	91	92	92	93	91	93	93	–
Re-treatment success (ss+ patients, %)	90	92	89	87	86	76	85	–

Note: notification, case detection and treatment success rates are for the whole country (i.e. DOTS and non-DOTS cases combined).

DOTS EXPANSION AND ENHANCEMENT

Overview of services for diagnosis of TB and treatment of patients

Description of basic management unit	Referral hospital
Number of units (DOTS/total), 2007	77/77
Location of NTP services	
Rural Health centre	
Urban Referral hospital	
NTP services part of general primary health-care network?	Yes
Location where TB diagnosed	
Rural Former district hospital	
Urban Referral hospital	
Diagnosis free of charge?	Yes (all suspects)
Treatment supervised?	All patients in all units
Intensive phase	Health-care worker, community member, family member
Continuation phase	Health-care worker, community member, family member
Category I regimen	2(HR)ZE/4(HR)
Treatment free of charge	All patients in all units
External review missions	last: 2006
	next: –

Political commitment

National strategic plan?	Yes (2006–2010)
Mechanism for national interagency coordination?	Yes (established 2001)
National Stop TB Partnership?	No (planned –)

Financial indicators, 2009

(see final page for detailed presentation)	%
Government contribution to NTP budget (incl loans)	10
Government contribution to total cost TB control (incl loans)	27
Government health spending used for TB control	14
NTP budget funded	65

Per capita health financial indicators, 2009

	US$
NTP budget per capita	0.7
Total costs for TB control per capita	0.9
Funding gap per capita	0.3
Government health expenditure per capita (2005)	6.9
Total health expenditure per capita (2005)	29

Quality-assured bacteriology

National reference laboratory?	Yes

All TB laboratories performing EQA of smear microscopy or DST under the supervision of the National Reference Laboratory

	Smear				Culture		DST			
	Number	per 100 000	EQA	% adeq perf	Number	per 5 000 000	Number	per 10 000 000	EQA	% adeq perf
2007	201	1.4	186	70	3	1.0	1	0.7	1.0	100%
2008	205	1.4	205	–	5	1.7	1	0.7	1.0	–

Note: for routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extra-pulmonary and ss–/HIV+ TB, as well as DST of re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population. EQA column shows number of laboratories for which EQA was done. Adeq perf; adequate performance for microscopy based on results of EQA.

System for managing drug supplies and laboratory equipment

	Central level			Peripheral level		
	2005	2006	2007	2005	2006	2007
Stock-outs of laboratory supplies?	–	No	No	–	No	No
Stock-outs of first-line anti-TB drugs?	No	No	No	No	No	No

Monitoring and evaluation system, and impact measurement

NTP publishes annual report?	Yes (since 1995)
% of BMUs reporting to next level in 2007	
Case-finding	100%
Treatment outcomes	100%

Burden and impact assessment		last	next
In-depth analysis of routine surveillance data	No	–	–
Prevalence of disease survey	Yes, national	2002	2010
Prevalence of infection survey	Yes, national	2002	2010
Drug resistance survey	Yes, national	2001	Ongoing
Mortality survey	No	–	–
Analysis of vital registration data	No	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES

Multidrug-resistant TB (MDR-TB)

	2005	2006	2007
	Number (% of estimated ss+ MDR-TB)		
Estimated incidence of ss+ MDR cases	92	93	94
Diagnosed and notified	– (–%)	– (–%)	16 (17%)
Registered for treatment	– (–%)	– (–%)	11 (12%)
GLC	0	0	11
non-GLC	–	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES (*continued*)

Detection and treatment of HIV in TB patients, 2007

TB patients for whom the HIV test result was known	14 245
as % of all notified TB patients	39
TB patients with positive HIV test	2 922
as % of all estimated HIV+ TB cases	53
HIV+ TB patients started or continued on CPT	1 101
as % of HIV+ TB patients notified	38
HIV+ TB patients started or continued on ART	610
as % of HIV+ TB patients notified	21

Screening for TB in HIV-positive patients, 2007

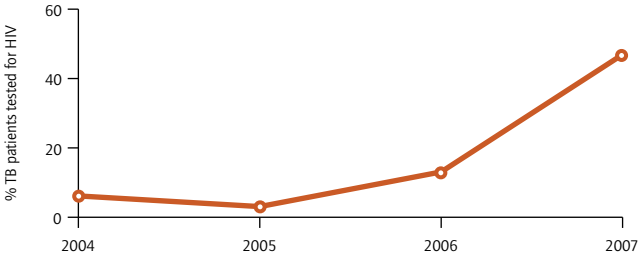
HIV+ patients in HIV care or ART register	11 641
Screened for TB	5 318
as % of HIV+ patients in HIV care or ART register	46
Started on TB treatment	1 801
as % of HIV+ patients in HIV care or ART register	15
Started on IPT	77
as % of HIV+ patients without TB in HIV care or ART register	0.8

High-risk groups, 2007

Number of close contacts of ss+ TB patients screened	–
Number of TB cases identified among contacts	–
% of contacts with TB	–
Contacts started on IPT	–
% of contacts without TB on IPT	–

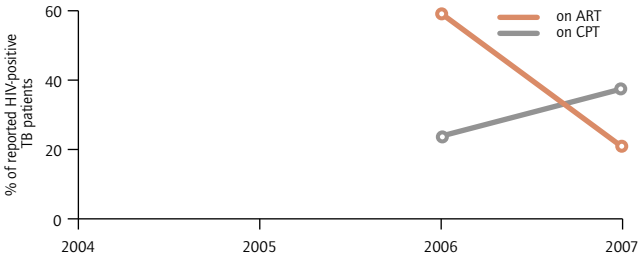
HIV testing for TB patients

Between 2006 and 2007 the proportion of TB patients screened for HIV almost quadrupled



CPT and ART for HIV-positive TB patients

The proportion of HIV-positive TB patients receiving ART fell substantially in 2007 compared with 2006



CONTRIBUTING TO HEALTH SYSTEM STRENGTHENING

Control of TB is fully integrated into the primary health-care system, within which it has contributed to strengthening laboratory capacity. TB control is well aligned with the national health plan, the SWAP and with the Medium-term Expenditure Framework for health. The NTP is a leader in engaging private pharmacies to deliver public health interventions.

Practical Approach to Lung Health (PAL), 2007

Number of health-care facilities providing PAL services	0	As % of total number of health-care facilities	0

ENGAGING ALL CARE PROVIDERS

Public-public and public-private approaches (PPM), 2007

Number of providers collaborating with the NTP[c]

	Number collaborating (total number of providers)	% total notified TB Diagnosed	Treated
Public sector	– (–)	–	–
Private sector	1 358 (–)	–	2.3

International Standards for Tuberculosis Care (ISTC)

ISTC endorsed by professional organizations?	No
ISTC included in medical curriculum?	No

EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

Advocacy, communication and social mobilization (ACSM)

The NTP participated in an ACSM workshop and drafted a 12-month action plan for implementation of ACSM activities and a national strategic plan. Materials for World TB Day included a 10-minute video of senior ministry officials, health care staff and TB patients explaining what they were doing to stop TB. A communication strategy to raise awareness about TB among indigenous communities in north-east Cambodia was also developed. IEC materials produced by the NTP are widely used, including by NGOs.

Community participation in TB care and Patients' Charter

Approximately 50% of public health centres in the country are implementing activities to involve communities in TB control; the target is to increase this to >80% by 2010. In areas where the initiative has been implemented, treatment supporters ("DOT watchers") are often involved in other support groups or NGOs and are supervised regularly by health centre staff. The Patients' Charter is not yet being used in health facilities.

ENABLING AND PROMOTING RESEARCH

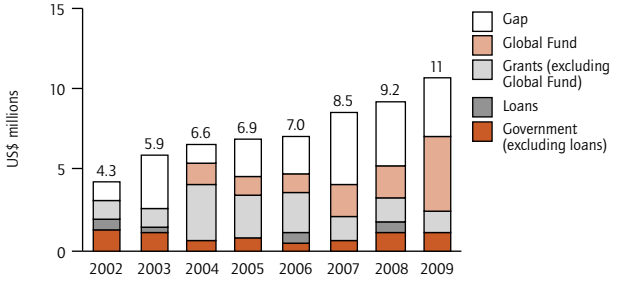
Programme-based operational research, 2007

Operational research budget (% of NTP budget)	3.5%

FINANCING

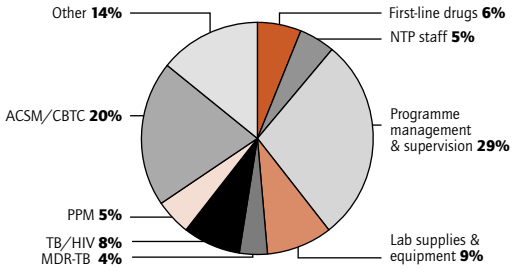
a. NTP budget by source of funding

Continued increase in budget with increased funding in 2009; Global Fund is now the main source of financing



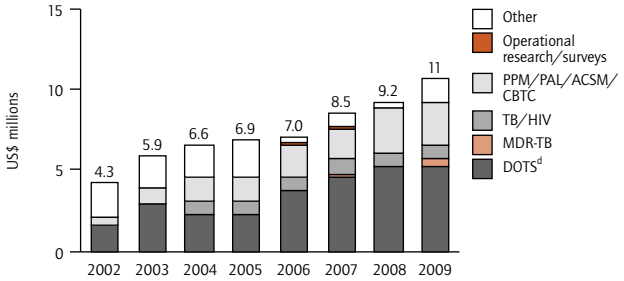
b. NTP budget line items in 2009

DOTS accounts for almost half (49%) of the NTP budget; large share of the budget is for ACSM, especially compared with other HBCs



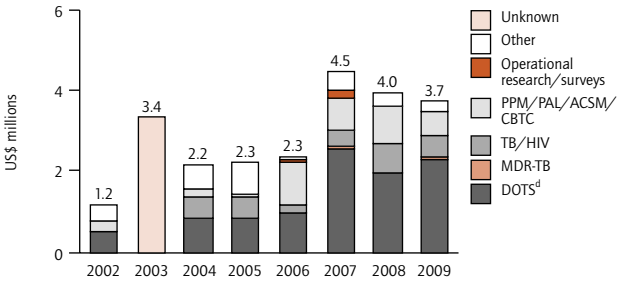
c. NTP budget by line item

Large increase in budgets for DOTS and ACSM since 2004



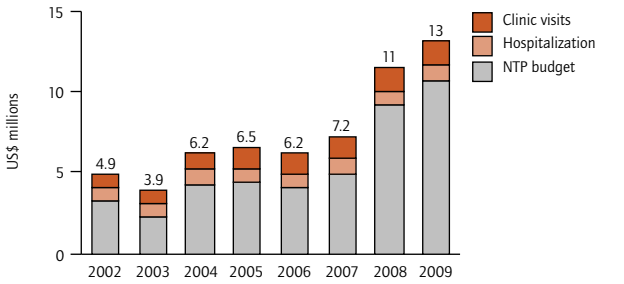
d. NTP funding gap by line item

Funding gaps have persisted and within DOTS are mainly for programme management and supervision



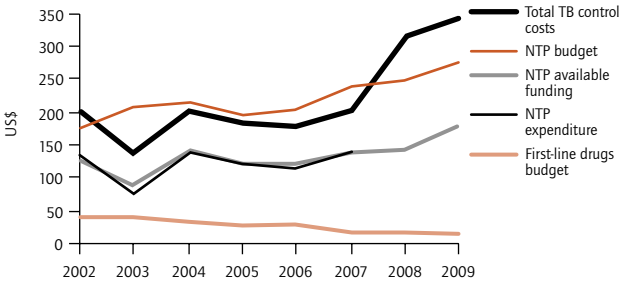
e. Total TB control costs by line item[1]

Cost of clinic visits based on 64 visits per patient during treatment for new TB patients; hospitalization costs are for 1200 TB beds



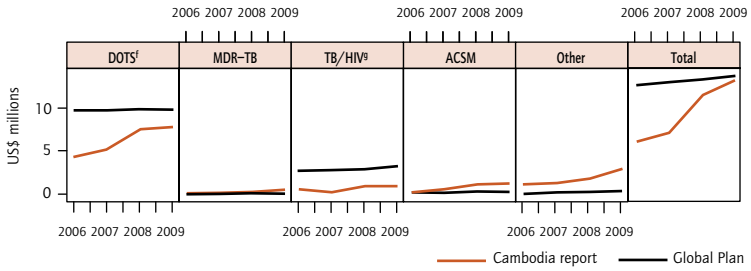
f. Per patient costs, budgets and expenditures[2]

Increased cost, expenditure and available funding per patient but declining first-line drugs budget per patient; expenditures close to available funding



g. Global Plan compared with country reports[e]

Global Plan funding requirements higher for DOTS and TB/HIV due to higher projections of patients to be treated (ss–/extrapulmonary under DOTS and HIV+ TB patients on ART, respectively); country plan ahead of Global Plan for other categories



h. NTP budget and funding gap by Stop TB Strategy component (US$ millions)

	2009 BUDGET	GAP
DOTS expansion and enhancement	5.2	2.3
TB/HIV, MDR-TB and other challenges	1.3	0.6
Health system strengthening	0	0
Engage all care providers	0.5	0.2
People with TB, and communities	2.2	0.5
Research and surveys	0	0
Other	1.5	0.2

SOURCES, METHODS AND ABBREVIATIONS

[a–g] Please see footnotes page 169.

[1] Total TB control costs for 2002–2007 are based on expenditure, whereas those for 2008–2009 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

[2] NTP available funding for 2004–2007 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003 and 2008–2009 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.

– indicates not available or not applicable; pop, population; ss+, sputum smear-positive; ss–, sputum smear-negative pulmonary; unk, pulmonary – sputum smear not done or result unknown.

China

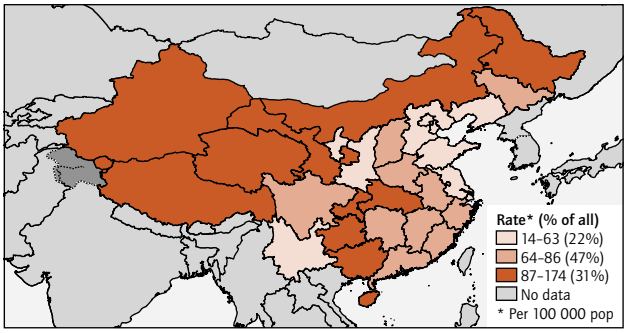
China is maintaining high case detection and treatment success rates. Efforts to improve access to TB care are being accelerated in order to achieve faster reductions in prevalence and mortality. Capacity building to improve the quality of data and analysis will contribute to an improved understanding of TB epidemiology in the country and a better understanding of the situation of hard-to-reach populations such as migrants, ethnic minorities and the elderly. There is a need to plan for rapid scale-up of programmatic management of MDR-TB, including sustainable financing for human resources, quality-assured laboratories and second-line drugs. Collaboration and coordination between the public health sector and the general and specialized hospitals are a challenge given the financing arrangements for public health services in hospitals.

SURVEILLANCE AND EPIDEMIOLOGY

Population (thousands)[a] 1 328 630

Estimates of epidemiological burden, 2007[b]	ALL	IN HIV+ PEOPLE
Incidence		
All forms of TB (thousands of new cases per year)	1 306	25
All forms of TB (new cases per 100 000 pop/year)	98	1.9
Rate of change in incidence rate (%), 2006–2007	**–1.0**	**–0.4**
New ss+ cases (thousands of new cases per year)	585	8.6
New ss+ cases (per 100 000 pop/year)	**44**	0.7
HIV+ incident TB cases (% of all TB cases)	1.9	–
Prevalence		
All forms of TB (thousands of cases)	2 582	12
All forms of TB (cases per 100 000 pop)	**194**	0.9
2015 target for prevalence (cases per 100 000 pop)	**164**	–
Mortality		
All forms of TB (thousands of deaths per year)	201	6.8
All forms of TB (deaths per 100 000 pop/year)	**15**	0.5
2015 target for mortality (deaths per 100 000 pop/year)	**12**	–
Multidrug-resistant TB (MDR-TB)		
MDR-TB among all new TB cases (%)	5.0	–
MDR-TB among previously treated TB cases (%)	26	–

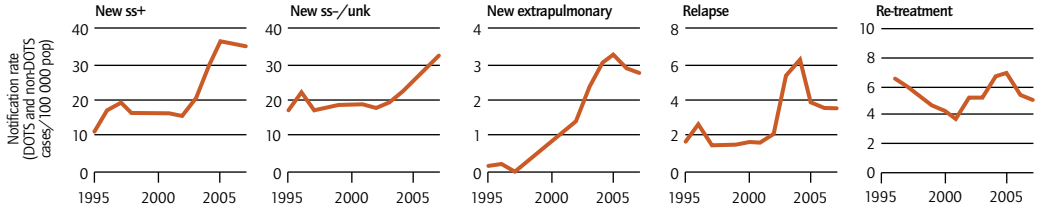
TB notification rate (new and relapse), 2007



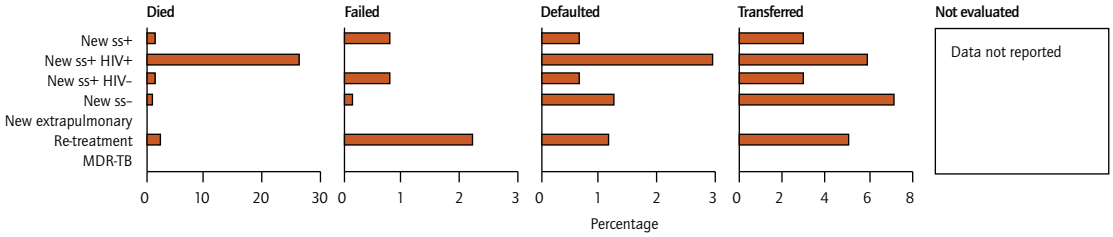
Total notifications, 2007

Notified new and relapse cases (thousands)	980
Notified new and relapse cases (per 100 000 pop/year)	74
Notified new ss+ cases (thousands)	466
Notified new ss+ cases (per 100 000 pop/year)	35
as % of new pulmonary cases	52
sex ratio (male/female)	2.4
DOTS case detection rate (% of estimated new ss+)	**80**
Notified new extrapulmonary cases (thousands)	37
as % of notified new cases	3.9
Notified new ss+ cases in children (<15 years) (thousands)	2.1
as % of notified new ss+ cases	0.5

Case notifications



Unfavourable treatment outcomes, 2006 cohorts



	2000	2001	2002	2003	2004	2005	2006	2007
DOTS coverage (%)	68	68	78	91	96	100	100	100
Notification rate (new & relapse cases/100 000 pop)	36	37	36	47	61	68	71	74
% notified new & relapse cases reported under DOTS	78	78	83	90	97	100	100	100
Notification rate (new ss+ cases/100 000 pop)	16	16	15	21	29	36	35	35
% notified new ss+ cases reported under DOTS	90	90	92	96	98	100	100	100
Case detection rate (all new cases, %)	32	33	33	41	54	64	68	71
Case detection rate (new ss+ cases, %)	34	34	33	45	65	80	80	80
Treatment success (new ss+ patients, %)	93	95	92	93	94	94	94	–
Re-treatment success (ss+ patients, %)	89	92	88	89	89	90	89	–

Note: notification, case detection and treatment success rates are for the whole country (i.e. DOTS and non-DOTS cases combined).

DOTS EXPANSION AND ENHANCEMENT

Overview of services for diagnosis of TB and treatment of patients

Description of basic management unit	District TB dispensary
Number of units (DOTS/total), 2007	2681/2681
Location of NTP services	
Rural Village health clinic	
Urban Community health service station	
NTP services part of general primary health-care network?	Yes
Location where TB diagnosed	
Rural County TB dispensary	
Urban District TB dispensary	
Diagnosis free of charge?	Yes (all suspects)
Treatment supervised?	All patients in all units
Intensive phase	Health-care worker, community member, family member
Continuation phase	Health-care worker, community member, family member
Category I regimen	2HRZE3/4HR3
Treatment free of charge	All patients in all units
External review missions	last: 2008 next: 2009

Political commitment

National strategic plan?	Yes (2001–2010)
Mechanism for national interagency coordination?	Yes (established 2002)
National Stop TB Partnership?	Yes (established 2002)

Financial indicators, 2009

(see final page for detailed presentation)	%
Government contribution to NTP budget (incl loans)	77
Government contribution to total cost TB control (incl loans)	77
Government health spending used for TB control	0.5
NTP budget funded	96

Per capita health financial indicators, 2009

	US$
NTP budget per capita	0.2
Total costs for TB control per capita	0.2
Funding gap per capita	0.01
Government health expenditure per capita (2005)	31
Total health expenditure per capita (2005)	81

Quality-assured bacteriology

National reference laboratory?	Yes

All TB laboratories performing EQA of smear microscopy or DST under the supervision of the National Reference Laboratory

	Smear				Culture		DST			
	Number	per 100 000	EQA	% adeq perf	Number	per 5 000 000	Number	per 10 000 000	EQA	% adeq perf
2007	3 294	0.2	3 294	98%	327	1.2	187	1.4	13	100%
2008	3 294	0.2	3 294	–	507	1.9	187	1.4	33	–

Note: for routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extra-pulmonary and ss–/HIV+ TB, as well as DST of re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population. EQA column shows number of laboratories for which EQA was done. Adeq perf; adequate performance for microscopy based on results of EQA.

System for managing drug supplies and laboratory equipment

	Central level			Peripheral level		
	2005	2006	2007	2005	2006	2007
Stock-outs of laboratory supplies?	–	Yes	No	–	Some units	No
Stock-outs of first-line anti-TB drugs?	No	No	No	Yes	No	No

Monitoring and evaluation system, and impact measurement

NTP publishes annual report?	Yes (since 2004)
% of BMUs reporting to next level in 2007	
Case-finding	100%
Treatment outcomes	100%

Burden and impact assessment		last	next
In-depth analysis of routine surveillance data	Yes	2006	2008
Prevalence of disease survey	Yes, national	2000	2010
Prevalence of infection survey	Yes, national	2000	2010
Drug resistance survey	Yes, sub-national	1997–2005	Ongoing
Mortality survey	Yes	2000	2010
Analysis of vital registration data	No	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES

Multidrug-resistant TB (MDR-TB)

	2005	2006	2007
	Number (% of estimated ss+ MDR-TB)		
Estimated incidence of ss+ MDR cases	76 783	76 471	76 154
Diagnosed and notified	– (–%)	– (–%)	– (–%)
Registered for treatment	– (–%)	– (–%)	– (–%)
GLC	0	0	0
non-GLC	–	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES (*continued*)

Detection and treatment of HIV in TB patients, 2007

TB patients for whom the HIV test result was known	34 557
as % of all notified TB patients	3.3
TB patients with positive HIV test	1 187
as % of all estimated HIV+ TB cases	4.8
HIV+ TB patients started or continued on CPT	679
as % of HIV+ TB patients notified	57
HIV+ TB patients started or continued on ART	519
as % of HIV+ TB patients notified	44

Screening for TB in HIV-positive patients, 2007

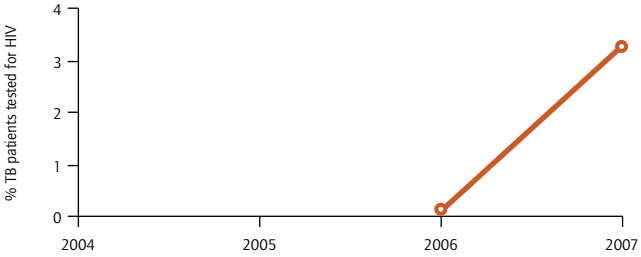
HIV+ patients in HIV care or ART register	39 866
Screened for TB	16 931
as % of HIV+ patients in HIV care or ART register	42
Started on TB treatment	899
as % of HIV+ patients in HIV care or ART register	2.3
Started on IPT	0
as % of HIV+ patients without TB in HIV care or ART register	0

High-risk groups, 2007

Number of close contacts of ss+ TB patients screened	828 931
Number of TB cases identified among contacts	43 577
% of contacts with TB	5
Contacts started on IPT	–
% of contacts without TB on IPT	–

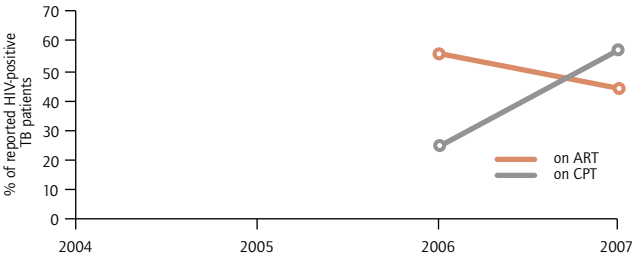
HIV testing for TB patients

In 2007, 3% of TB patients were screened for HIV



CPT and ART for HIV-positive TB patients

In 2007 the proportion of HIV-positive TB patients receiving ART decreased while the proportion of those receiving CPT doubled



CONTRIBUTING TO HEALTH SYSTEM STRENGTHENING

A major challenge to strengthening health systems is the lack of coordination between disease-specific control programmes and the hospital sector, where the focus on public health is weak and where most revenue is generated through user charges. The NTP has started to bridge this gap by improving referral and notification linkages between general hospitals and TB dispensaries, building on the existing web-based electronic notification system for communicable diseases.

Practical Approach to Lung Health (PAL), 2007

Number of health-care facilities providing PAL services	–	As % of total number of health-care facilities	–

ENGAGING ALL CARE PROVIDERS

Public-public and public-private approaches (PPM), 2007

Number of providers collaborating with the NTP[c]

	Number collaborating (total number of providers)	% total notified TB Diagnosed	Treated
Public sector	47 696 (47 696)	–	–
Private sector	– (–)	–	–

International Standards for Tuberculosis Care (ISTC)

ISTC endorsed by professional organizations?	No
ISTC included in medical curriculum?	No

EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

Advocacy, communication and social mobilization (ACSM)

A national ACSM strategy that includes impact indicators has been developed. A major component of this strategy is a year-round national Stop TB campaign that is supported by an ambassador who is a well-known folk singer. The campaign coordinates a variety of activities including a TB knowledge contest organized through a prominent Chinese web portal; close collaboration with the mass media including TB-specific programming and public service announcements on television; campaigns to increase awareness about TB in schools and local communities; and public events on World TB Day featuring the vice minister and other senior officials of the Ministry of Health, the TB ambassador and NTP programme managers. Courses for training provincial health promotion staff about IEC materials, developing communication strategies, and monitoring and evaluation have also been held.

Community participation in TB care and Patients' Charter

Activities to raise community awareness are being implemented. Treatment support by community, township and village health workers is due to be introduced with funding from the Global Fund round 8 grant. No data on use of the Patients' Charter were reported.

ENABLING AND PROMOTING RESEARCH

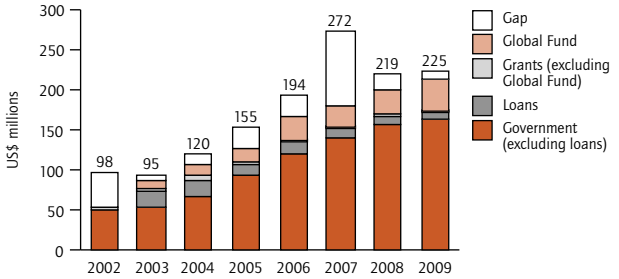
Programme-based operational research, 2007

Operational research budget (% of NTP budget)	0.4%

FINANCING

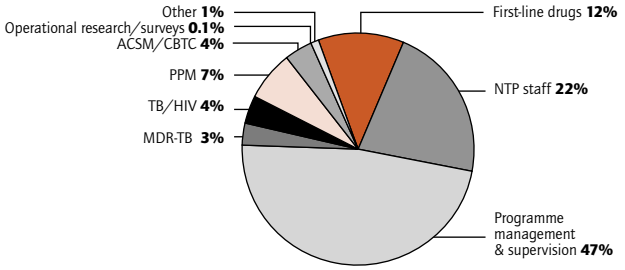
a. NTP budget by source of funding

NTP budget more than doubled since 2002 with minimal funding gap in 2009; now benefiting from Global Fund round 1 Rolling Continuation Channel



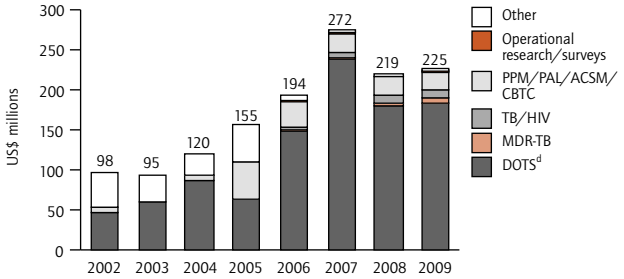
b. NTP budget line items in 2009

82% of budget is for DOTS; budget for MDR-TB relatively small



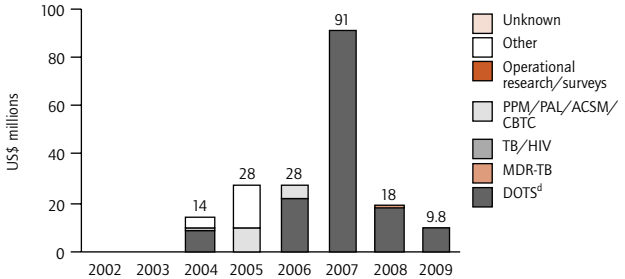
c. NTP budget by line item

Budget for MDR-TB diagnosis and treatment has more than tripled since 2007 but remains small; apart from DOTS, largest budget is for PPM



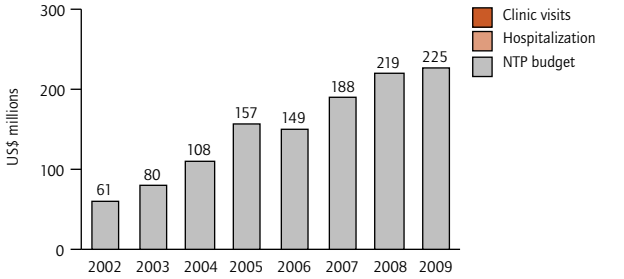
d. NTP funding gap by line item

Funding gaps within DOTS are for routine programme management and supervision



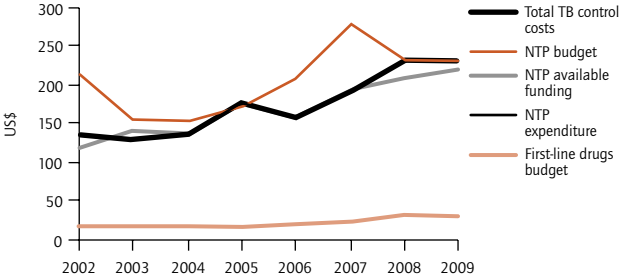
e. Total TB control costs by line item[1]

All costs for TB control are included in the NTP budget



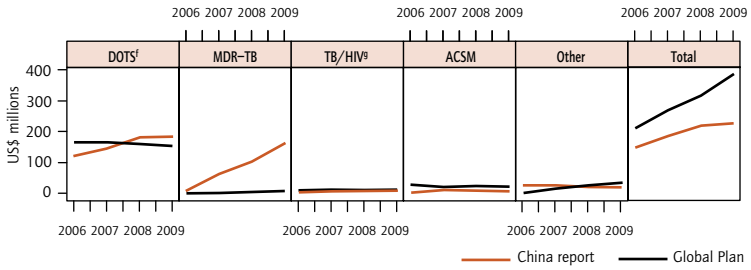
f. Per patient costs, budgets and expenditures[2,3]

Increased cost, budget and expenditure per patient since 2006 as more elements of the Stop TB Strategy are implemented; budgets, available funding and expenditures very similar



g. Global Plan compared with country reports[e]

Higher projections of patients to be treated mean country estimates of funding requirements for DOTS higher than Global Plan estimates; in contrast, plans and associated funding requirements for enrolment of patients on MDR-TB treatment are far below Global Plan targets



h. NTP budget and funding gap by Stop TB Strategy component (US$ millions)

	2009 BUDGET	GAP
DOTS expansion and enhancement	184	9.8
TB/HIV, MDR-TB and other challenges	16	0
Health system strengthening	0	0
Engage all care providers	16	0
People with TB, and communities	7.9	0
Research and surveys	0.3	0
Other	1.2	0

SOURCES, METHODS AND ABBREVIATIONS

[a–g] Please see footnotes page 169.

[1] Total TB control costs for 2002–2007 are based on expenditure, whereas those for 2008–2009 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

[2] NTP available funding for 2004–2007 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003 and 2008–2009 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.

[3] Estimates of expenditure are based on received funding.

– indicates not available or not applicable; pop, population; ss+, sputum smear-positive; ss–, sputum smear-negative pulmonary; unk, pulmonary – sputum smear not done or result unknown.

Democratic Republic of the Congo

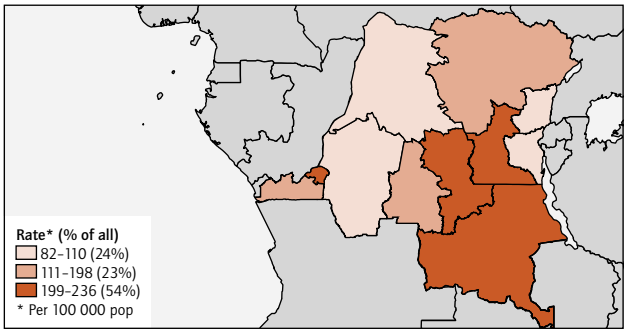
The case notification rate increased in 2007 following intensive efforts to implement the Stop TB Strategy. Treatment success rates are above target at 86%. Major efforts are required to expand collaborative TB/HIV activities and diagnosis and treatment of MDR-TB. The diagnostic capacity of the NRL has improved and the construction of a larger NRL will be completed in 2008. Recurrent shortages of drugs and supplies, including HIV test kits, need to be addressed. The health system faces considerable obstacles with regard to basic infrastructure, human resources and security problems. TB control is well aligned with the national health plan, the SWAP, and with the Medium-term Expenditure Framework for health. Despite increased funding in recent years, large funding gaps remain.

SURVEILLANCE AND EPIDEMIOLOGY

Population (thousands)[a] 62 636

Estimates of epidemiological burden, 2007[b]	ALL	IN HIV+ PEOPLE
Incidence		
All forms of TB (thousands of new cases per year)	245	14
All forms of TB (new cases per 100 000 pop/year)	392	23
Rate of change in incidence rate (%), 2006–2007	**–2.6**	**–2.1**
New ss+ cases (thousands of new cases per year)	109	5.1
New ss+ cases (per 100 000 pop/year)	174	8.1
HIV+ incident TB cases (% of all TB cases)	5.9	–
Prevalence		
All forms of TB (thousands of cases)	417	7.2
All forms of TB (cases per 100 000 pop)	**666**	12
2015 target for prevalence (cases per 100 000 pop)	**138**	–
Mortality		
All forms of TB (thousands of deaths per year)	51	6.0
All forms of TB (deaths per 100 000 pop/year)	**82**	9.6
2015 target for mortality (deaths per 100 000 pop/year)	**18**	–
Multidrug-resistant TB (MDR-TB)		
MDR-TB among all new TB cases (%)	2.3	–
MDR-TB among previously treated TB cases (%)	10	–

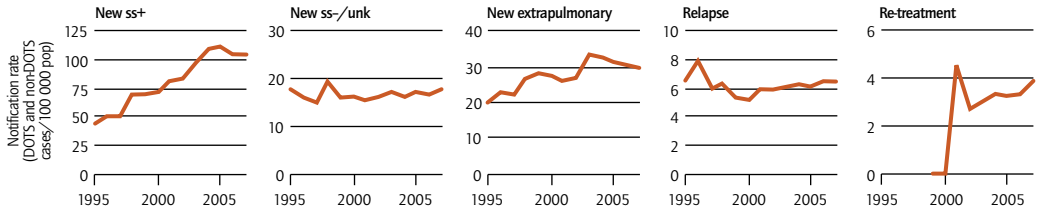
TB notification rate (new and relapse), 2007



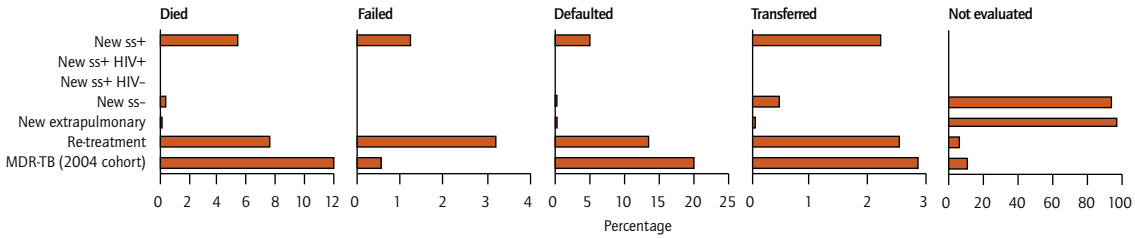
Total notifications, 2007

Notified new and relapse cases (thousands)	100
Notified new and relapse cases (per 100 000 pop/year)	159
Notified new ss+ cases (thousands)	66
Notified new ss+ cases (per 100 000 pop/year)	106
as % of new pulmonary cases	86
sex ratio (male/female)	1.1
DOTS case detection rate (% of estimated new ss+)	**61**
Notified new extrapulmonary cases (thousands)	19
as % of notified new cases	20
Notified new ss+ cases in children (<15 years) (thousands)	3.2
as % of notified new ss+ cases	4.8

Case notifications



Unfavourable treatment outcomes, 2006 cohorts



	2000	2001	2002	2003	2004	2005	2006	2007
DOTS coverage (%)	70	70	70	75	75	100	100	100
Notification rate (new & relapse cases/100 000 pop)	120	128	132	153	164	165	158	159
% notified new & relapse cases reported under DOTS	100	100	100	100	100	100	100	100
Notification rate (new ss+ cases/100 000 pop)	71	81	83	97	109	111	105	106
% notified new ss+ cases reported under DOTS	100	100	100	100	100	100	100	100
Case detection rate (all new cases, %)	33	33	32	36	38	39	38	39
Case detection rate (new ss+ cases, %)	47	49	47	53	59	60	59	61
Treatment success (new ss+ patients, %)	78	77	78	83	85	85	86	–
Re-treatment success (ss+ patients, %)	–	–	67	72	71	74	67	–

Note: notification, case detection and treatment success rates are for the whole country (i.e. DOTS and non-DOTS cases combined).

DOTS EXPANSION AND ENHANCEMENT

Overview of services for diagnosis of TB and treatment of patients

Description of basic management unit	Health centre or hospital
Number of units (DOTS/total), 2007	1205/1205
Location of NTP services	
Rural	Health centre, referral health centre, hospital
Urban	Health centre, referral health centre
NTP services part of general primary health-care network?	Yes
Location where TB diagnosed	
Rural	Health centre or hospital
Urban	Health centre or hospital
Diagnosis free of charge?	Yes (if TB is confirmed)
Treatment supervised?	All patients in all units
Intensive phase	Health-care worker, community member, family member
Continuation phase	Health-care worker, community member, family member
Category I regimen	2(HRZE)/4(HR)
Treatment free of charge	All patients in all units
External review missions	last: –
	next: –

Political commitment

National strategic plan?	Yes (2006–2015)
Mechanism for national interagency coordination?	Yes (established 2005)
National Stop TB Partnership?	No (planned –)

Financial indicators, 2009

(see final page for detailed presentation)	%
Government contribution to NTP budget (incl loans)	3.1
Government contribution to total cost TB control (incl loans)	21
Government health spending used for TB control	64
NTP budget funded	30

Per capita health financial indicators, 2009

	US$
NTP budget per capita	0.8
Total costs for TB control per capita	1.0
Funding gap per capita	0.6
Government health expenditure per capita (2005)	1.7
Total health expenditure per capita (2005)	5.0

Quality-assured bacteriology

National reference laboratory?	Yes

All TB laboratories performing EQA of smear microscopy or DST under the supervision of the National Reference Laboratory

	Smear				Culture		DST			
	Number	per 100 000	EQA	% adeq perf	Number	per 5 000 000	Number	per 10 000 000	EQA	% adeq perf
2007	1 205	1.9	1 023	60%	1	0.1	1	0.2	1.0	0%
2008	1 545	2.4	1 545	–	1	0.1	1	0.2	1.0	–

Note: for routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extra-pulmonary and ss–/HIV+ TB, as well as DST of re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population. EQA column shows number of laboratories for which EQA was done. Adeq perf; adequate performance for microscopy based on results of EQA.

System for managing drug supplies and laboratory equipment

	Central level			Peripheral level		
	2005	2006	2007	2005	2006	2007
Stock-outs of laboratory supplies?	–	No	No	–	Some units	No
Stock-outs of first-line anti-TB drugs?	No	No	Yes	Yes	Some units	Some units

Monitoring and evaluation system, and impact measurement

NTP publishes annual report?	No
% of BMUs reporting to next level in 2007	
Case-finding	100%
Treatment outcomes	100%

Burden and impact assessment		last	next
In-depth analysis of routine surveillance data	Yes	2005	2010
Prevalence of disease survey	No	–	–
Prevalence of infection survey	No	–	–
Drug resistance survey	Yes, sub-national	1999	–
Mortality survey	No	–	–
Analysis of vital registration data	No	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES

Multidrug-resistant TB (MDR-TB)

	2005	2006	2007
	Number (% of estimated ss+ MDR-TB)		
Estimated incidence of ss+ MDR cases	4 087	4 112	4 137
Diagnosed and notified	178 (4.4%)	118 (2.9%)	82 (2.0%)
Registered for treatment	178 (4.4%)	118 (2.9%)	79 (1.9%)
GLC	0	0	0
non-GLC	178	118	79

MDR-TB, TB/HIV AND OTHER CHALLENGES (*continued*)

Detection and treatment of HIV in TB patients, 2007

TB patients for whom the HIV test result was known	14 484
as % of all notified TB patients	14
TB patients with positive HIV test	2 129
as % of all estimated HIV+ TB cases	15
HIV+ TB patients started or continued on CPT	2 015
as % of HIV+ TB patients notified	95
HIV+ TB patients started or continued on ART	419
as % of HIV+ TB patients notified	20

Screening for TB in HIV-positive patients, 2007

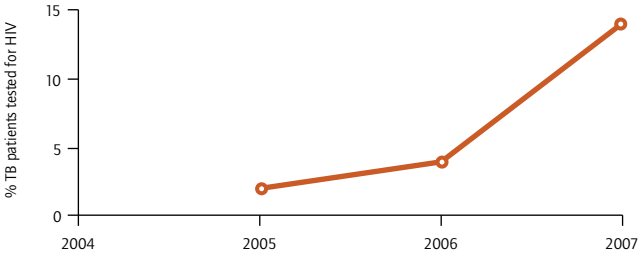
HIV+ patients in HIV care or ART register	277 202
Screened for TB	–
as % of HIV+ patients in HIV care or ART register	–
Started on TB treatment	–
as % of HIV+ patients in HIV care or ART register	–
Started on IPT	–
as % of HIV+ patients without TB in HIV care or ART register	–

High-risk groups, 2007

Number of close contacts of ss+ TB patients screened	–
Number of TB cases identified among contacts	–
% of contacts with TB	–
Contacts started on IPT	–
% of contacts without TB on IPT	–

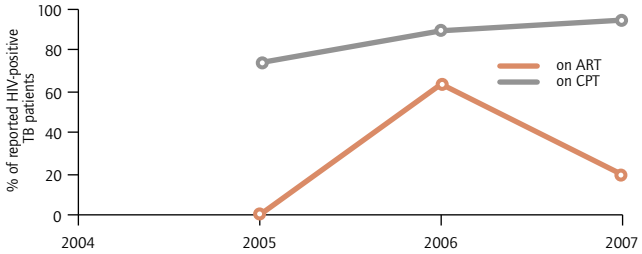
HIV testing for TB patients

The proportion of TB patients screened for HIV has increased steadily over the past three years but remains low



CPT and ART for HIV-positive TB patients

The proportion of patients receiving ART has declined by two thirds from 2006 to 2007 while the provision of CPT has steadily increased



CONTRIBUTING TO HEALTH SYSTEM STRENGTHENING

Limited basic infrastructure, shortage of human resources and security problems in several areas are challenges affecting health systems in general and TB control in particular. The NTP is addressing these challenges jointly with other stakeholders by aligning its NTP plan with the national health plan, the SWAP and the Medium-term Expenditure Framework for health.

Practical Approach to Lung Health (PAL), 2007

Number of health-care facilities providing PAL services	0	As % of total number of health-care facilities	0

ENGAGING ALL CARE PROVIDERS

Public-public and public-private approaches (PPM), 2007

Number of providers collaborating with the NTP[c]

	Number collaborating (total number of providers)	% total notified TB Diagnosed	Treated
Public sector	– (–)	–	–
Private sector	551 (–)	–	–

International Standards for Tuberculosis Care (ISTC)

ISTC endorsed by professional organizations?	No
ISTC included in medical curriculum?	Yes

EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

Advocacy, communication and social mobilization (ACSM)

A KAP survey is planned for 2009.

Community participation in TB care and Patients' Charter

Communities have been involved in TB control in five areas, through inclusion of family or community members as treatment supporters. However, no administrative area has full coverage of community-based services. One large patient organization is involved in TB treatment in 33 health centres in the capital and is committed to expanding a wide range of activities. TB indicators in the area have been steadily increasing since community-based services were launched in 1999.

ENABLING AND PROMOTING RESEARCH

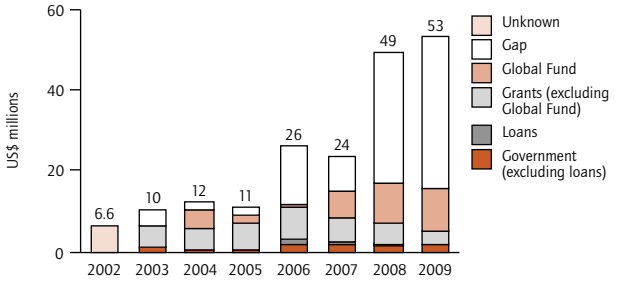
Programme-based operational research, 2007

Operational research budget (% of NTP budget)	1.7%

FINANCING

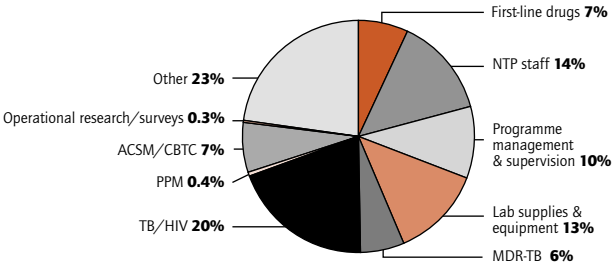
a. NTP budget by source of funding

Large increase in budget since 2008 after major revision of strategic plan and budget; funding has grown but large funding gap remains



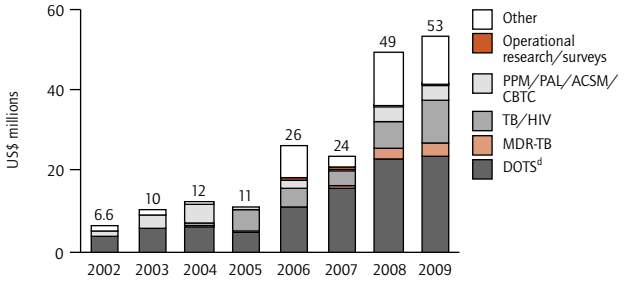
b. NTP budget line items in 2009

Largest share of budget is for DOTS (44%), Other (23%) and collaborative TB/HIV activities (20%)



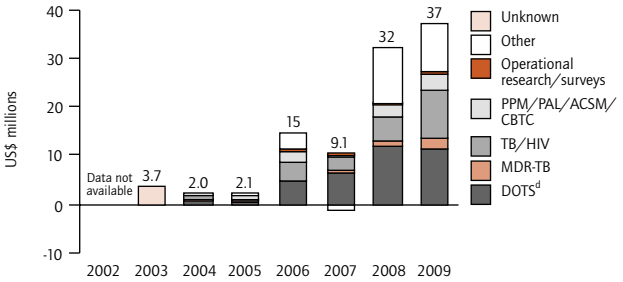
c. NTP budget by line item

Within DOTS, increased budget is for NTP staff and laboratory supplies and equipment; also noticeable increase in budget for TB/HIV and ACSM



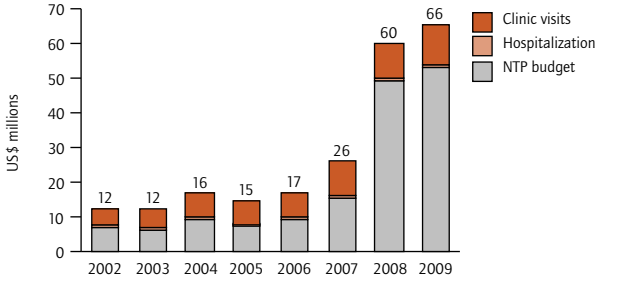
d. NTP funding gap by line item

Funding gaps for all major budget categories; within DOTS in 2008 and 2009 gaps are mainly for dedicated NTP staff and laboratory supplies and equipment



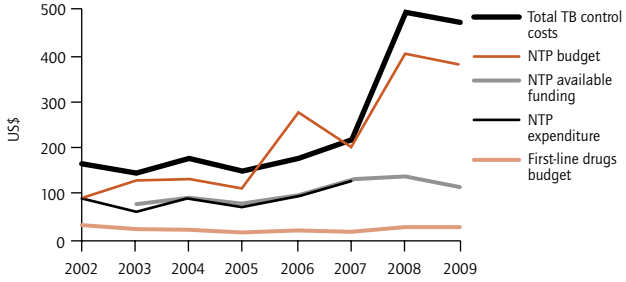
e. Total TB control costs by line item[1]

Cost of clinic visits based on 76 visits for new patients during treatment; minimal reliance on hospitalization



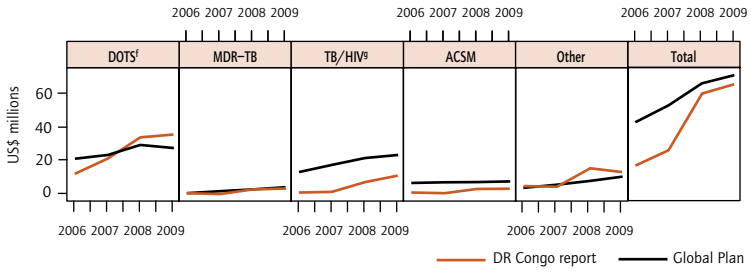
f. Per patient costs, budgets and expenditures[2]

Increasing cost per patient since 2005 as newer elements of TB control introduced; expenditure similar to available funding suggesting good absorption capacity



g. Global Plan compared with country reports[e]

Country plan in line with the Global Plan in 2008 and 2009 except for TB/HIV; full implementation requires funding gaps to be closed



h. NTP budget and funding gap by Stop TB Strategy component (US$ millions)

	2009 BUDGET	GAP
DOTS expansion and enhancement	23	11
TB/HIV, MDR-TB and other challenges	14	12
Health system strengthening	0.2	0.2
Engage all care providers	0.2	0.2
People with TB, and communities	3.5	2.9
Research and surveys	0.2	0.2
Other	12	10

SOURCES, METHODS AND ABBREVIATIONS

[a–g] Please see footnotes page 169.

[1] Total TB control costs for 2002–2007 are based on expenditure, whereas those for 2008–2009 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

[2] NTP available funding for 2004–2007 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003 and 2008–2009 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.

– indicates not available or not applicable; pop, population; ss+, sputum smear-positive; ss–, sputum smear-negative pulmonary; unk, pulmonary – sputum smear not done or result unknown.

Ethiopia

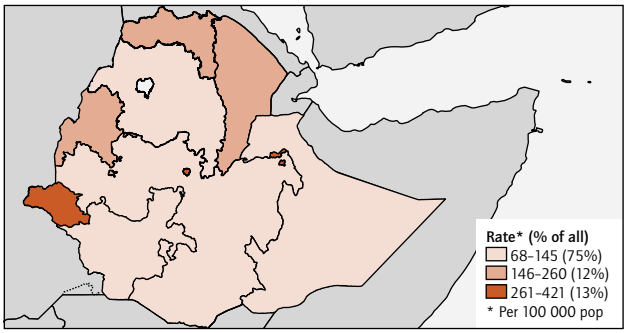
In 2007, the Ministry of Health expanded the network of general health-care facilities and engaged health extension workers and private health clinics in a concerted effort to increase the case detection rate. Increases in the NTP budget for laboratory strengthening activities and intensified case-finding among HIV patients are expected to contribute to an improved case detection rate. Five regional laboratories are being rebuilt and equipped to conduct culture, DST and line-probe assays, in collaboration with GLI/FIND/WHO. Although constrained by staff shortages, the NTP benefits from the global focus on the health worker crisis and the associated development of strategies to "treat, train, and retain" health workers. Piloting of MDR-TB treatment is under way, and a national survey of the prevalence of TB disease is planned for 2009–2010.

SURVEILLANCE AND EPIDEMIOLOGY

Population (thousands)[a] 83 099

Estimates of epidemiological burden, 2007[b]	ALL	IN HIV+ PEOPLE
Incidence		
All forms of TB (thousands of new cases per year)	314	61
All forms of TB (new cases per 100 000 pop/year)	378	74
Rate of change in incidence rate (%), 2006–2007	**–2.6**	**–3.0**
New ss+ cases (thousands of new cases per year)	135	21
New ss+ cases (per 100 000 pop/year)	163	26
HIV+ incident TB cases (% of all TB cases)	19	–
Prevalence		
All forms of TB (thousands of cases)	481	31
All forms of TB (cases per 100 000 pop)	**579**	37
2015 target for prevalence (cases per 100 000 pop)	**156**	–
Mortality		
All forms of TB (thousands of deaths per year)	76	23
All forms of TB (deaths per 100 000 pop/year)	**92**	28
2015 target for mortality (deaths per 100 000 pop/year)	**20**	–
Multidrug-resistant TB (MDR-TB)		
MDR-TB among all new TB cases (%)	1.6	–
MDR-TB among previously treated TB cases (%)	12	–

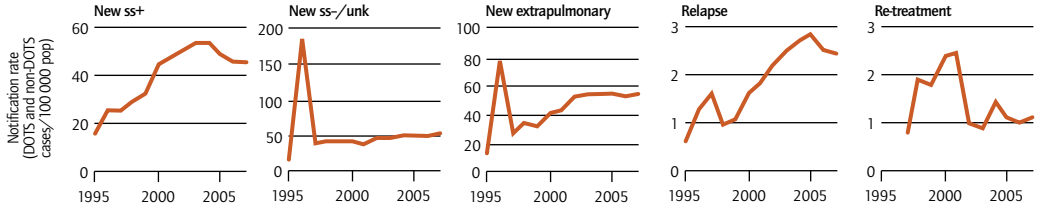
TB notification rate (new and relapse), 2007



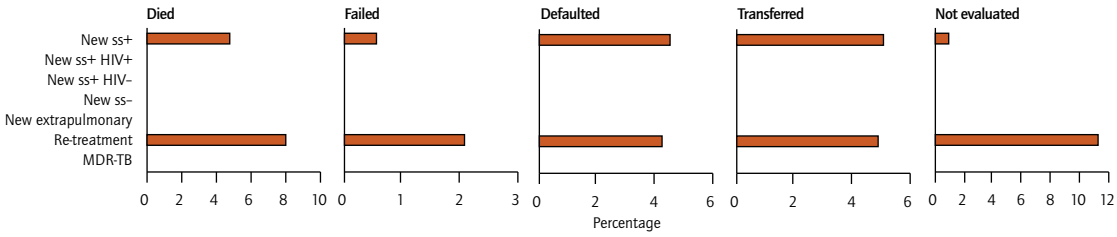
Total notifications, 2007

Notified new and relapse cases (thousands)	129
Notified new and relapse cases (per 100 000 pop/year)	155
Notified new ss+ cases (thousands)	38
Notified new ss+ cases (per 100 000 pop/year)	46
as % of new pulmonary cases	47
sex ratio (male/female)	1.2
DOTS case detection rate (% of estimated new ss+)	**28**
Notified new extrapulmonary cases (thousands)	45
as % of notified new cases	36
Notified new ss+ cases in children (<15 years) (thousands)	2.3
as % of notified new ss+ cases	6.0

Case notifications



Unfavourable treatment outcomes, 2006 cohorts



	2000	2001	2002	2003	2004	2005	2006	2007
DOTS coverage (%)	85	70	95	95	70	90	100	95
Notification rate (new & relapse cases/100 000 pop)	131	133	151	157	160	157	151	155
% notified new & relapse cases reported under DOTS	100	100	100	100	100	100	100	100
Notification rate (new ss+ cases/100 000 pop)	44	46	50	53	54	49	45	46
% notified new ss+ cases reported under DOTS	100	100	100	100	100	100	100	100
Case detection rate (all new cases, %)	39	36	39	39	39	39	38	40
Case detection rate (new ss+ cases, %)	31	30	30	31	31	28	27	28
Treatment success (new ss+ patients, %)	80	76	76	70	79	78	84	–
Re-treatment success (ss+ patients, %)	71	64	60	60	54	56	69	–

Note: notification, case detection and treatment success rates are for the whole country (i.e. DOTS and non-DOTS cases combined).

DOTS EXPANSION AND ENHANCEMENT

Overview of services for diagnosis of TB and treatment of patients

Description of basic management unit	Health centre or hospital
Number of units (DOTS/total), 2007	580/611
Location of NTP services	
Rural Health centre	
Urban Health centre or hospital	
NTP services part of general primary health-care network?	Yes
Location where TB diagnosed	
Rural Health center	
Urban Health centre or hospital	
Diagnosis free of charge?	Yes (all suspects)
Treatment supervised?	All patients in all units
Intensive phase	Health-care worker, community member
Continuation phase	Health-care worker, community member
Category I regimen	2(HRZE)/6(HE)
Treatment free of charge	All patients in all units
External review missions	last: 2002
	next: –

Political commitment

National strategic plan?	Yes (2007–2010)
Mechanism for national interagency coordination?	Yes (established 2007)
National Stop TB Partnership?	No (planned 2009)

Financial indicators, 2009

(see final page for detailed presentation)	%
Government contribution to NTP budget (incl loans)	4.0
Government contribution to total cost TB control (incl loans)	27
Government health spending used for TB control	11
NTP budget funded	31

Per capita health financial indicators, 2009

	US$
NTP budget per capita	0.3
Total costs for TB control per capita	0.4
Funding gap per capita	0.2
Government health expenditure per capita (2005)	3.9
Total health expenditure per capita (2005)	6.4

Quality-assured bacteriology

National reference laboratory?	Yes

All TB laboratories performing EQA of smear microscopy or DST under the supervision of the National Reference Laboratory

	Smear				Culture		DST			
	Number	per 100 000	EQA	% adeq perf	Number	per 5 000 000	Number	per 10 000 000	EQA	% adeq perf
2007	833	1.0	–	–	1	0.1	1	0.1	0	–
2008	1 000	1.2	512	–	6	0.4	6	0.7	6.0	–

Note: for routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extra-pulmonary and ss–/HIV+ TB, as well as DST of re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population. EQA column shows number of laboratories for which EQA was done. Adeq perf; adequate performance for microscopy based on results of EQA.

System for managing drug supplies and laboratory equipment

	Central level			Peripheral level		
	2005	2006	2007	2005	2006	2007
Stock-outs of laboratory supplies?	–	No	No	–	No	Some units
Stock-outs of first-line anti-TB drugs?	No	No	Yes	No	No	Some units

Monitoring and evaluation system, and impact measurement

NTP publishes annual report?	Yes (since 2004)
% of BMUs reporting to next level in 2007	
Case-finding	–
Treatment outcomes	–

Burden and impact assessment		last	next
In-depth analysis of routine surveillance data	No	–	–
Prevalence of disease survey	Yes, national	–	2009
Prevalence of infection survey	No	–	–
Drug resistance survey	Yes, national	2005	–
Mortality survey	No	–	–
Analysis of vital registration data	No	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES

Multidrug-resistant TB (MDR-TB)

	2005	2006	2007
	Number (% of estimated ss+ MDR-TB)		
Estimated incidence of ss+ MDR cases	3 088	3 088	3 086
Diagnosed and notified	– (–%)	– (–%)	145 (4.7%)
Registered for treatment	– (–%)	– (–%)	– (–%)
GLC	0	0	0
non-GLC	–	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES (CONTINUED)

Detection and treatment of HIV in TB patients, 2007

TB patients for whom the HIV test result was known	20 723
as % of all notified TB patients	16
TB patients with positive HIV test	6 342
as % of all estimated HIV+ TB cases	10
HIV+ TB patients started or continued on CPT	4 529
as % of HIV+ TB patients notified	71
HIV+ TB patients started or continued on ART	2 658
as % of HIV+ TB patients notified	42

Screening for TB in HIV-positive patients, 2007

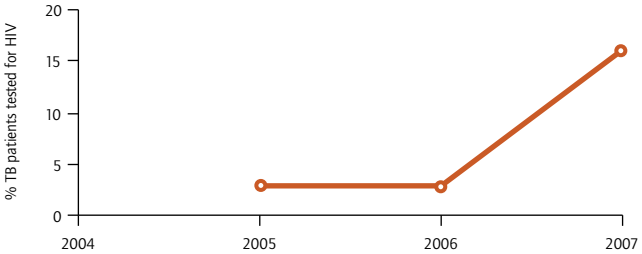
HIV+ patients in HIV care or ART register	58 000
Screened for TB	7 879
as % of HIV+ patients in HIV care or ART register	14
Started on TB treatment	2,000
as % of HIV+ patients in HIV care or ART register	3.4
Started on IPT	2 381
as % of HIV+ patients without TB in HIV care or ART register	4.3

High-risk groups, 2007

Number of close contacts of ss+ TB patients screened	–
Number of TB cases identified among contacts	–
% of contacts with TB	–
Contacts started on IPT	–
% of contacts without TB on IPT	–

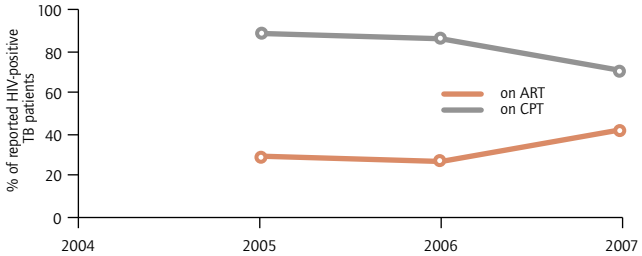
HIV testing for TB patients

In 2007 there was a six-fold increase in the proportion of TB patients screened for HIV compared with 2006



CPT and ART for HIV-positive TB patients

The provision of ART to HIV-positive TB patients almost doubled in 2007 compared with 2006, while the provision of CPT has fallen



CONTRIBUTING TO HEALTH SYSTEM STRENGTHENING

The public health-care system, into which TB control is fully integrated, is constrained by a lack of human resources and difficulties in providing outreach services, particularly in rural areas. Expansion of the network of general health-care facilities will improve access to health care and ultimately help to achieve targets for TB control. TB control is aligned with this expansion of health care through the national health plan and the SWAP.

Practical Approach to Lung Health (PAL), 2007

Number of health-care facilities providing PAL services	0	As % of total number of health-care facilities	0

ENGAGING ALL CARE PROVIDERS

Public-public and public-private approaches (PPM), 2007

Number of providers collaborating with the NTP[c]

	Number collaborating (total number of providers)	% total notified TB Diagnosed	Treated
Public sector	96 (96)	–	–
Private sector	108 (–)	1.8	1.8

International Standards for Tuberculosis Care (ISTC)

ISTC endorsed by professional organizations?	No
ISTC included in medical curriculum?	No

EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

Advocacy, communication and social mobilization (ACSM)

ACSM has been integrated into the National Strategic Plan 2008–2010. A KAP survey is planned for 2009, and an ACSM Task Force has been established.

Community participation in TB care and Patients' Charter

The successful Health Extension Programme employs almost 30 000 health service extension workers, the majority of whom are women who are trained and supervised and who receive salaries. This programme is the backbone of every intervention carried out at the community level and is designed to provide preventive services, including the detection and referral of TB suspects, in all rural villages. No data on use of the Patients' Charter were reported.

ENABLING AND PROMOTING RESEARCH

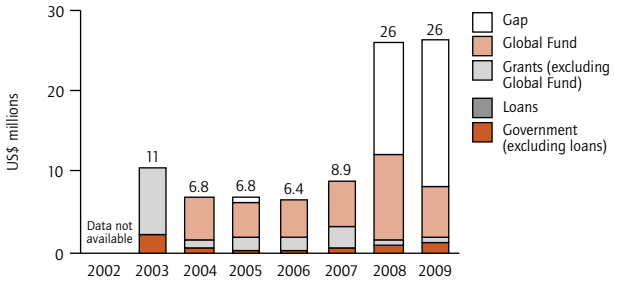
Programme-based operational research, 2007

Operational research budget (% of NTP budget)	0%

FINANCING

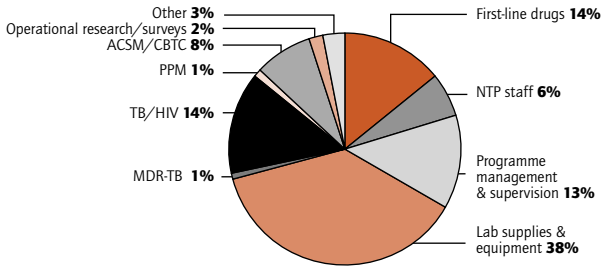
a. NTP budget by source of funding

Large increase in budget in 2008 and 2009 but large funding gaps; Global Fund is the main source of financing



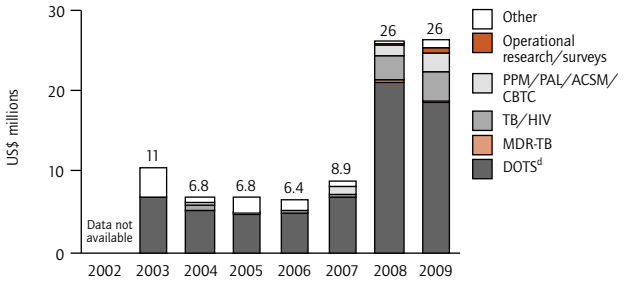
b. NTP budget line items in 2009

Plan and budget developed for almost every component of the Stop TB Strategy; DOTS is the largest component (71%) followed by TB/HIV (14%)



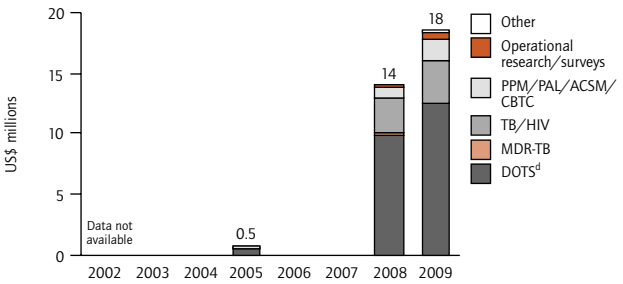
c. NTP budget by line item

Increased budget within DOTS mainly for laboratory supplies and equipment, including establishment of 6 culture and DST sites and country-wide expansion of health facilities; bigger budget for TB/HIV is for scale-up to additional 340 sites



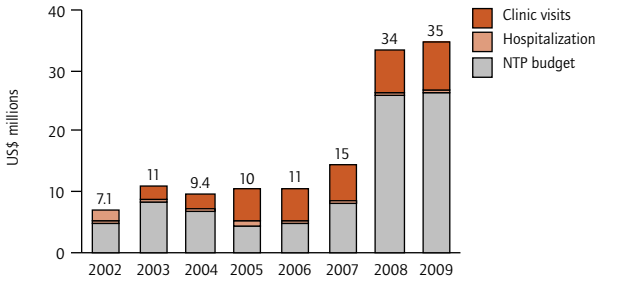
d. NTP funding gap by line item

Funding gap within DOTS mainly for first-line drugs (2009) and laboratory supplies and equipment (2008–2009)



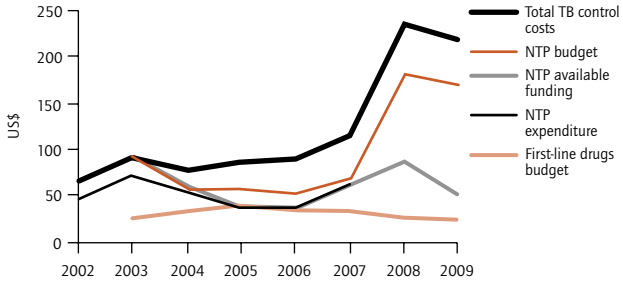
e. Total TB control costs by line item[1]

Costs for clinic visits based on 66 outpatient visits per new TB patient to health facilities during treatment; very limited use of hospitalization



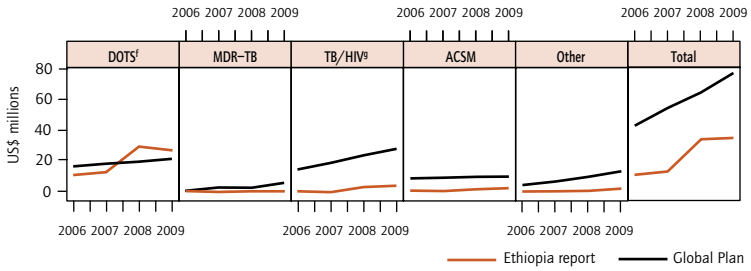
f. Per patient costs, budgets and expenditures[2]

Big increase in costs and budget per patient from 2008 as activities broadened in line with the Stop TB Strategy



g. Global Plan compared with country reports[e]

Country implementation behind Global Plan targets 2006–2007; country plans for 2008–2009 ahead of Global Plan for DOTS, in contrast to other components of TB control, although difference for TB/HIV probably exaggerated after downward revision in estimate of HIV prevalence



h. NTP budget and funding gap by Stop TB Strategy component (US$ millions)

	2009 BUDGET	GAP
DOTS expansion and enhancement	19	12
TB/HIV, MDR-TB and other challenges	3.9	3.3
Health system strengthening	0	0
Engage all care providers	0.1	0.1
People with TB, and communities	2.1	1.6
Research and surveys	0.6	0.6
Other	0.9	0.1

SOURCES, METHODS AND ABBREVIATIONS

[a–g] Please see footnotes page 169.

[1] Total TB control costs for 2002–2007 are based on expenditure, whereas those for 2008–2009 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

[2] NTP available funding for 2004–2007 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003 and 2008–2009 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.

– indicates not available or not applicable; pop, population; ss+, sputum smear-positive; ss–, sputum smear-negative pulmonary; unk, pulmonary – sputum smear not done or result unknown.

India

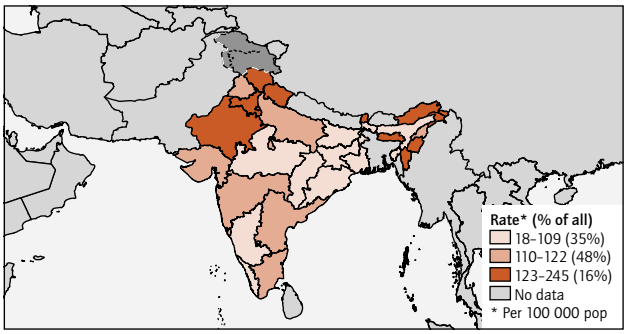
All Ministry of Health facilities in India were providing DOTS services by 2006, and there are ongoing initiatives to collaborate with the public sector beyond the Ministry of Health, and with NGOs, medical colleges and private practitioners. This collaboration has helped to achieve a case detection rate of 68% (2007) and a treatment success rate of 86% (2006). Services to control MDR-TB are now available in designated sites within six states, with culture and DST facilities offered in five state-level laboratories. Weak laboratory capacity is a major barrier to scaling-up MDR-TB services. Collaborative TB/HIV activities have considerable scope for expansion. Launching of a coalition of associations of medical professionals by the Indian Medical Association has been a major step in engaging the private sector. Ensuring the rational use of anti-TB drugs outside the Revised National TB Control Programme is crucial.

SURVEILLANCE AND EPIDEMIOLOGY

Population (thousands)[a] 1 169 016

Estimates of epidemiological burden, 2007[b]	ALL	IN HIV+ PEOPLE
Incidence		
All forms of TB (thousands of new cases per year)	1 962	103
All forms of TB (new cases per 100 000 pop/year)	168	8.8
Rate of change in incidence rate (%), 2006–2007	**0**	**–4.1**
New ss+ cases (thousands of new cases per year)	873	36
New ss+ cases (per 100 000 pop/year)	75	3.1
HIV+ incident TB cases (% of all TB cases)	5.3	–
Prevalence		
All forms of TB (thousands of cases)	3 305	52
All forms of TB (cases per 100 000 pop)	**283**	4.4
2015 target for prevalence (cases per 100 000 pop)	**293**	–
Mortality		
All forms of TB (thousands of deaths per year)	331	30
All forms of TB (deaths per 100 000 pop/year)	**28**	2.5
2015 target for mortality (deaths per 100 000 pop/year)	**21**	–
Multidrug-resistant TB (MDR-TB)		
MDR-TB among all new TB cases (%)	2.8	–
MDR-TB among previously treated TB cases (%)	17	–

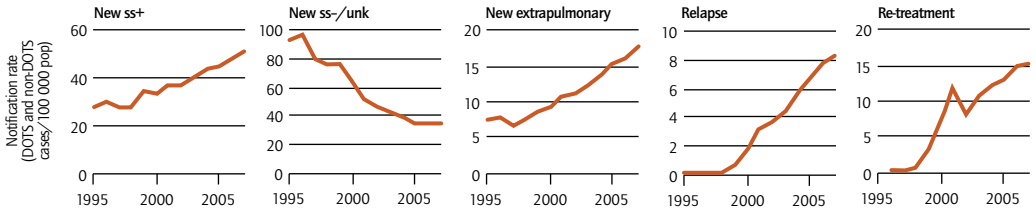
TB notification rate (new and relapse), 2007



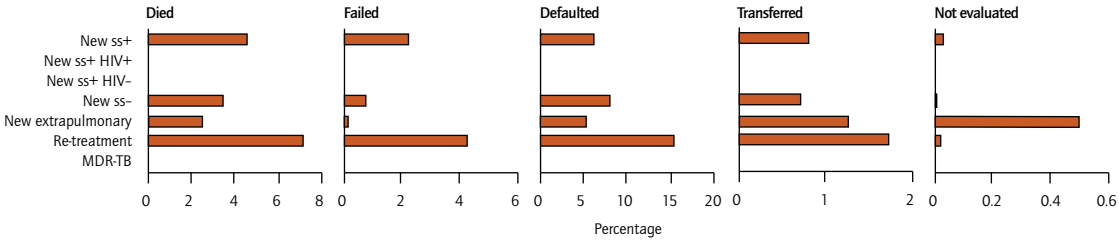
Total notifications, 2007

Notified new and relapse cases (thousands)	1 296
Notified new and relapse cases (per 100 000 pop/year)	111
Notified new ss+ cases (thousands)	593
Notified new ss+ cases (per 100 000 pop/year)	51
as % of new pulmonary cases	60
sex ratio (male/female)	2.3
DOTS case detection rate (% of estimated new ss+)	**68**
Notified new extrapulmonary cases (thousands)	207
as % of notified new cases	17
Notified new ss+ cases in children (<15 years) (thousands)	12
as % of notified new ss+ cases	2.0

Case notifications



Unfavourable treatment outcomes, 2006 cohorts



	2000	2001	2002	2003	2004	2005	2006	2007
DOTS coverage (%)	30	45	52	67	84	91	100	100
Notification rate (new & relapse cases/100 000 pop)	107	102	98	98	102	102	107	111
% notified new & relapse cases reported under DOTS	23	44	52	76	93	99	100	100
Notification rate (new ss+ cases/100 000 pop)	33	36	37	39	44	45	48	51
% notified new ss+ cases reported under DOTS	27	48	62	83	95	100	100	100
Case detection rate (all new cases, %)	63	59	56	56	57	57	59	61
Case detection rate (new ss+ cases, %)	45	49	49	53	59	60	64	68
Treatment success (new ss+ patients, %)	34	54	60	76	82	86	86	–
Re-treatment success (ss+ patients, %)	70	58	72	70	73	71	72	–

Note: notification, case detection and treatment success rates are for the whole country (i.e. DOTS and non-DOTS cases combined).

DOTS EXPANSION AND ENHANCEMENT

Overview of services for diagnosis of TB and treatment of patients

Description of basic management unit	Designated microscopy centres, most of which are part of general primary health-care facilities
Number of units (DOTS/total), 2007	634/634
Location of NTP services	
Rural	General health-care facilities in public, private and NGO sectors
Urban	General health-care facilities in public, private, NGO and corporate sectors
NTP services part of general primary health-care network?	Yes
Location where TB diagnosed	
Rural	Designated microscopy centres, most of which are part of general primary health-care facilities
Urban	Designated microscopy centres, most of which are part of general primary health-care facilities
Diagnosis free of charge?	Yes (all suspects)
Treatment supervised?	All patients in all units
Intensive phase	Health-care worker, community member
Continuation phase	Health-care worker, community member
Category I regimen	2HRZE3/4HR3
Treatment free of charge	All patients in all units
External review missions	last: 2006
	next: 2009

Political commitment

National strategic plan?	Yes (2006–2011)
Mechanism for national interagency coordination?	Yes (established 2002)
National Stop TB Partnership?	No (planned –)

Financial indicators, 2009

(see final page for detailed presentation)	%
Government contribution to NTP budget (incl loans)	46
Government contribution to total cost TB control (incl loans)	61
Government health spending used for TB control	1.8
NTP budget funded	70

Per capita health financial indicators, 2009

	US$
NTP budget per capita	0.1
Total costs for TB control per capita	0.1
Funding gap per capita	0.02
Government health expenditure per capita (2005)	6.8
Total health expenditure per capita (2005)	36

Quality-assured bacteriology

National reference laboratory?	Yes

All TB laboratories performing EQA of smear microscopy or DST under the supervision of the National Reference Laboratory

	Smear				Culture		DST			
	Number	per 100 000	EQA	% adeq perf	Number	per 5 000 000	Number	per 10 000 000	EQA	% adeq perf
2007	12 184	1.0	11 386	81%	11	0.05	11	0.1	8.0	75%
2008	13 000	1.1	13 000	–	17	0.1	17	0.1	17	–

Note: for routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extra-pulmonary and ss–/HIV+ TB, as well as DST of re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population. EQA column shows number of laboratories for which EQA was done. Adeq perf; adequate performance for microscopy based on results of EQA.

System for managing drug supplies and laboratory equipment

	Central level			Peripheral level		
	2005	2006	2007	2005	2006	2007
Stock-outs of laboratory supplies?	–	No	No	–	No	Some units
Stock-outs of first-line anti-TB drugs?	No	No	No	Yes	No	No

Monitoring and evaluation system, and impact measurement

NTP publishes annual report?	Yes (since 2001)
% of BMUs reporting to next level in 2007	
Case-finding	100%
Treatment outcomes	100%

Burden and impact assessment		last	next
In-depth analysis of routine surveillance data	Yes	2007	2008
Prevalence of disease survey	Yes, sub-national	2000	Ongoing
Prevalence of infection survey	Yes, national	2000–2003	Ongoing
Drug resistance survey	Yes, sub-national	1995–2006	Ongoing
Mortality survey	No	–	–
Analysis of vital registration data	No	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES

Multidrug-resistant TB (MDR-TB)

	2005	2006	2007
	Number (% of estimated ss+ MDR-TB)		
Estimated incidence of ss+ MDR cases	96 663	98 155	99 639
Diagnosed and notified	34 (0.04%)	33 (0.03%)	146 (0.15%)
Registered for treatment	34 (0.04%)	33 (0.03%)	88 (0.09%)
GLC	0	0	0
non-GLC	34	33	88

MDR-TB, TB/HIV AND OTHER CHALLENGES (*continued*)

Detection and treatment of HIV in TB patients, 2007

TB patients for whom the HIV test result was known	80 425
as % of all notified TB patients	5.5
TB patients with positive HIV test	9 324
as % of all estimated HIV+ TB cases	9.0
HIV+ TB patients started or continued on CPT	724
as % of HIV+ TB patients notified	7.8
HIV+ TB patients started or continued on ART	162
as % of HIV+ TB patients notified	1.7

Screening for TB in HIV-positive patients, 2007

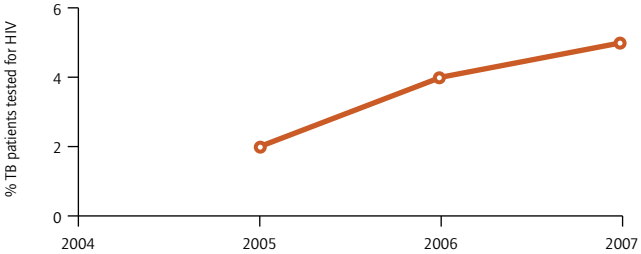
HIV+ patients in HIV care or ART register	277 760
Screened for TB	50 586
as % of HIV+ patients in HIV care or ART register	18
Started on TB treatment	7 130
as % of HIV+ patients in HIV care or ART register	2.6
Started on IPT	–
as % of HIV+ patients without TB in HIV care or ART register	–

High-risk groups, 2007

Number of close contacts of ss+ TB patients screened	–
Number of TB cases identified among contacts	–
% of contacts with TB	–
Contacts started on IPT	–
% of contacts without TB on IPT	–

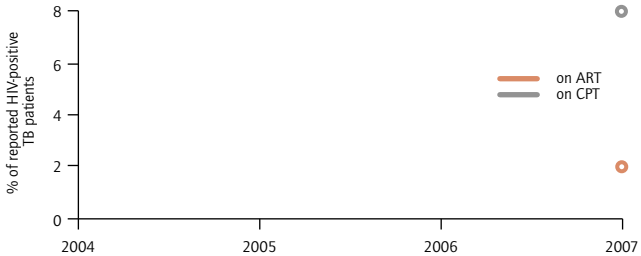
HIV testing for TB patients

The proportion of TB patients screened for HIV is low but continues to increase steadily



CPT and ART for HIV-positive TB patients

Among HIV-positive TB cases, 2% received ART and 8% received CPT in 2007



CONTRIBUTING TO HEALTH SYSTEM STRENGTHENING

TB control is fully integrated into general primary health-care services. Major challenges include poor primary health-care infrastructure in rural areas in several states, and unregulated private health care leading to widespread irrational use of first-line and second-line anti-TB drugs. The NTP is coordinating with the National Rural Health Mission, which is a reform initiative whose goal is to improve primary health care in rural areas. The NTP has also established several initiatives to improve TB care in the private sector, including collaboration with the Indian Medical Association.

Practical Approach to Lung Health (PAL), 2007

Number of health-care facilities providing PAL services	–	As % of total number of health-care facilities	–

ENGAGING ALL CARE PROVIDERS

Public-public and public-private approaches (PPM), 2007

Number of providers collaborating with the NTP[c]

	Number collaborating (total number of providers)	% total notified TB Diagnosed	Treated
Public sector	142 (143)	–	–
Private sector	20 983 (–)	–	–

International Standards for Tuberculosis Care (ISTC)

ISTC endorsed by professional organizations?	Yes
By which organizations:	
Indian Medical Association, 2007; key members of other professional associations in their individual capacity, March 2008	
ISTC included in medical curriculum?	No

EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

Advocacy, communication and social mobilization (ACSM)

A KAP survey was conducted in 2005 and a second survey is planned for 2010. Field visits have shown that state and district capacity to implement ACSM activities needs to be strengthened, and the RNTCP has taken steps to do this. For example, an agency has been hired to produce new IEC materials and to support states and districts to implement ACSM activities.

Community participation in TB care and Patients' Charter

As part of the national strategy to control TB, DOT is provided by health workers or trained community volunteers who are not family members in areas where health facilities are far from patients' homes. Intensified community-based activities are ongoing in areas with marginalized populations, particularly in urban slums and tribal populations. Community-based treatment of MDR-TB has been initiated in two states. No data on use of the Patients' Charter were reported in 2008.

ENABLING AND PROMOTING RESEARCH

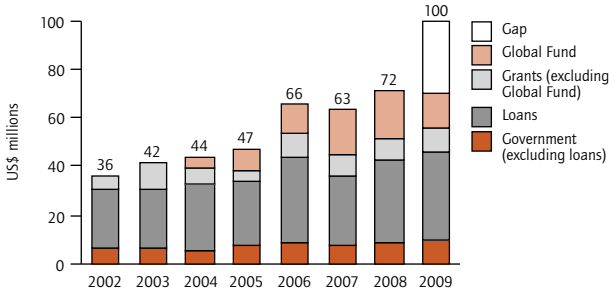
Programme-based operational research, 2007

Operational research budget (% of NTP budget)	1.5%

FINANCING

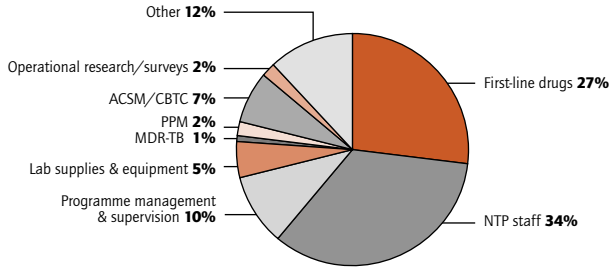
a. NTP budget by source of funding

Large increase in budget in 2009, with funding gap likely to be funded through Global Fund's Rolling Continuation Channel mechanism



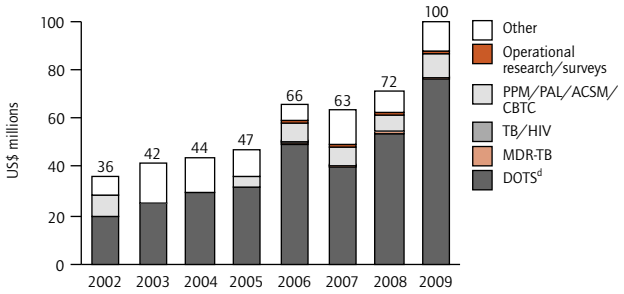
b. NTP budget line items in 2009

First-line drugs and NTP staff account for 61% of the budget; some first-line drugs are used in PPM schemes; budget for MDR-TB small in context of estimated number of cases



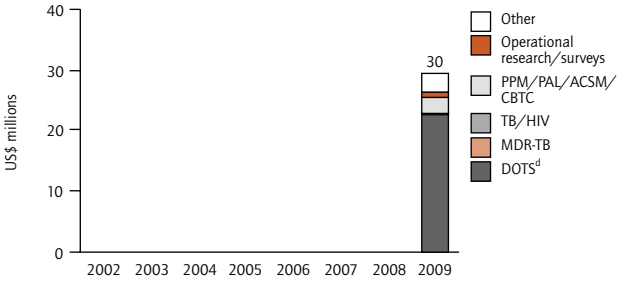
c. NTP budget by line item

Within DOTS, the budgets for first-line drugs and NTP staff have increased, primarily to maintain an adequate buffer stock and to increase salaries



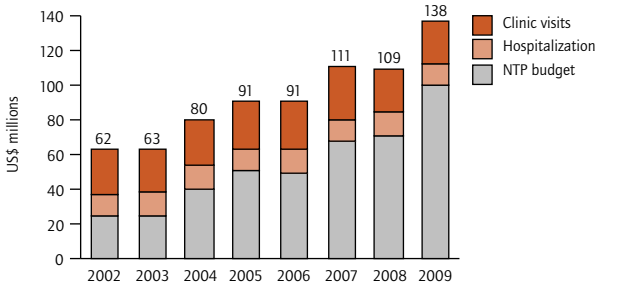
d. NTP funding gap by line item

Funding gap in 2009 likely to be closed via Global Fund; within DOTS gaps to be filled are mainly for first-line drugs and dedicated NTP staff



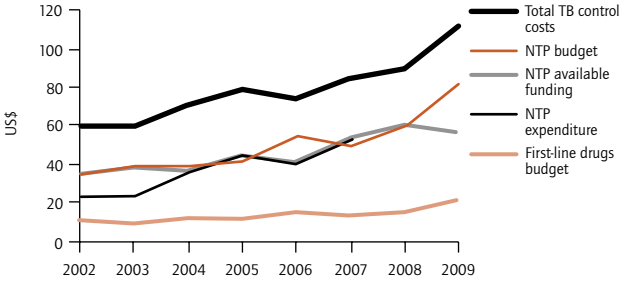
e. Total TB control costs by line item[1]

Hospitalization costs are for 11 750 dedicated TB beds; costs for clinic visits are based on an average of 27 visits to a health facility for DOT per TB patient



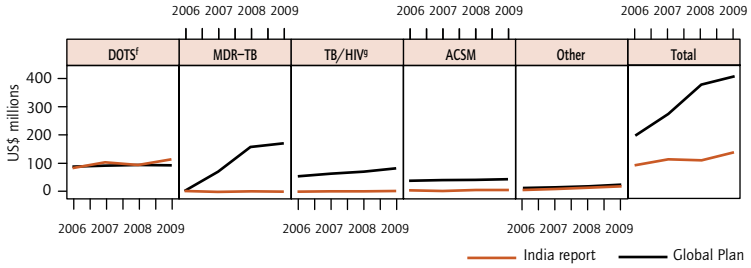
f. Per patient costs, budgets and expenditures[2]

Increasing cost, budget, available funding and expenditure per patient since 2002 as more elements of Stop TB Strategy implemented; higher budget for first-line drugs in 2009 due to purchase of buffer stock



g. Global Plan compared with country reports[e]

Country implementation of DOTS in line with Global Plan, but plan for expanding of MDR-TB treatment falls short of targets in the Global MDR/XDR-TB Response Plan; NTP budget for TB/HIV small because most activities funded through HIV budgets



h. NTP budget and funding gap by Stop TB Strategy component (US$ millions)

	2009 BUDGET	GAP
DOTS expansion and enhancement	76	23
TB/HIV, MDR-TB and other challenges	0.8	0.2
Health system strengthening	0	0
Engage all care providers	2.3	0.7
People with TB, and communities	6.9	2.1
Research and surveys	1.6	0.5
Other	12	3.5

SOURCES, METHODS AND ABBREVIATIONS

[a–g] Please see footnotes page 169.

[1] Total TB control costs for 2002–2007 are based on expenditure, whereas those for 2008–2009 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

[2] NTP available funding for 2004–2007 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003 and 2008–2009 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.

– indicates not available or not applicable; pop, population; ss+, sputum smear-positive; ss–, sputum smear-negative pulmonary; unk, pulmonary – sputum smear not done or result unknown.

Indonesia

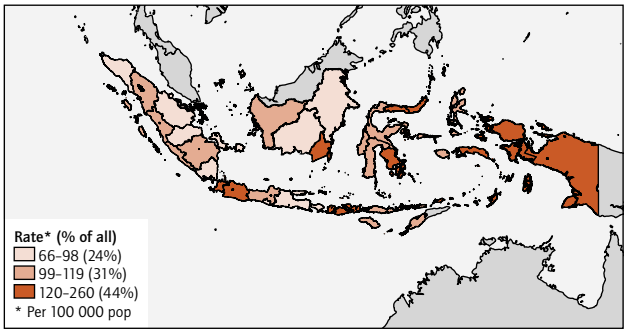
Implementation of the TB control programme in 2007 was affected by a temporary cessation of a Global Fund grant; the case detection rate decreased to 68% from 73% in 2006. Basic DOTS services were not affected, but the introduction of new initiatives was delayed. Notably, the treatment success rate has remained at 91% despite operational difficulties. Four laboratories have been accredited for drug susceptibility testing by an SRL. An application to the GLC was approved for provision of services in MDR-TB pilot sites. A series of tuberculin surveys have been initiated to provide better measurement of TB incidence, and a sentinel study has been designed to improve reporting of TB mortality. Limited outreach of the primary health-care system in rural areas and linkages with the hospital sector are some of the major challenges to TB control.

SURVEILLANCE AND EPIDEMIOLOGY

Population (thousands)[a] 231 627

Estimates of epidemiological burden, 2007[b]	ALL	IN HIV+ PEOPLE
Incidence		
All forms of TB (thousands of new cases per year)	528	16
All forms of TB (new cases per 100 000 pop/year)	228	6.9
Rate of change in incidence rate (%), 2006–2007	**–2.4**	**11**
New ss+ cases (thousands of new cases per year)	236	5.6
New ss+ cases (per 100 000 pop/year)	102	2.4
HIV+ incident TB cases (% of all TB cases)	3.0	–
Prevalence		
All forms of TB (thousands of cases)	566	8.0
All forms of TB (cases per 100 000 pop)	**244**	3.5
2015 target for prevalence (cases per 100 000 pop)	**221**	–
Mortality		
All forms of TB (thousands of deaths per year)	91	5.4
All forms of TB (deaths per 100 000 pop/year)	**39**	2.4
2015 target for mortality (deaths per 100 000 pop/year)	**46**	–
Multidrug-resistant TB (MDR-TB)		
MDR-TB among all new TB cases (%)	2.0	–
MDR-TB among previously treated TB cases (%)	20	–

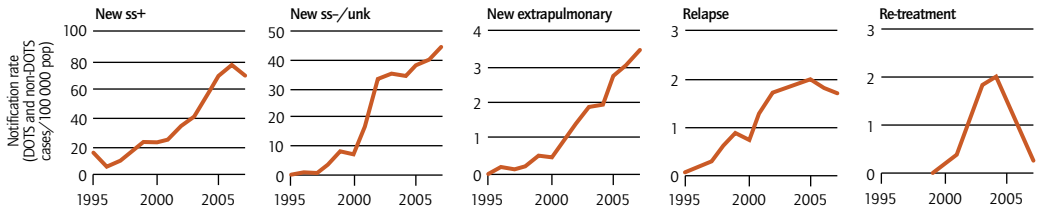
TB notification rate (new and relapse), 2007



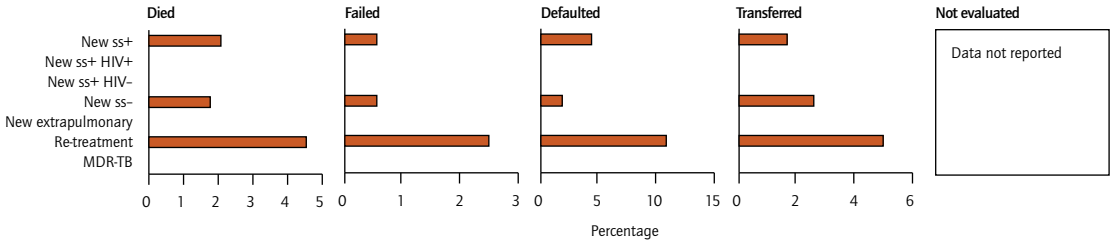
Total notifications, 2007

Notified new and relapse cases (thousands)	275
Notified new and relapse cases (per 100 000 pop/year)	119
Notified new ss+ cases (thousands)	161
Notified new ss+ cases (per 100 000 pop/year)	69
as % of new pulmonary cases	61
sex ratio (male/female)	1.4
DOTS case detection rate (% of estimated new ss+)	**68**
Notified new extrapulmonary cases (thousands)	8.0
as % of notified new cases	3.0
Notified new ss+ cases in children (<15 years) (thousands)	1.8
as % of notified new ss+ cases	1.1

Case notifications



Unfavourable treatment outcomes, 2006 cohorts



	2000	2001	2002	2003	2004	2005	2006	2007
DOTS coverage (%)	98	98	98	98	98	98	98	100
Notification rate (new & relapse cases/100 000 pop)	40	43	71	79	94	113	121	119
% notified new & relapse cases reported under DOTS	100	100	100	100	100	100	100	100
Notification rate (new ss+ cases/100 000 pop)	25	25	35	42	58	70	77	69
% notified new ss+ cases reported under DOTS	97	100	100	100	100	100	100	100
Case detection rate (all new cases, %)	12	16	27	31	38	46	51	51
Case detection rate (new ss+ cases, %)	20	21	30	37	53	66	73	68
Treatment success (new ss+ patients, %)	87	86	86	87	90	91	91	–
Re-treatment success (ss+ patients, %)	72	83	78	78	82	78	77	–

Note: notification, case detection and treatment success rates are for the whole country (i.e. DOTS and non-DOTS cases combined).

DOTS EXPANSION AND ENHANCEMENT

Overview of services for diagnosis of TB and treatment of patients

Description of basic management unit	Microscopy health centre and independent health centre
Number of units (DOTS/total), 2007	441/441
Location of NTP services	
Rural Health community centre (Puskesmas)	
Urban Health community centre (Puskesmas)	
NTP services part of general primary health-care network?	Yes
Location where TB diagnosed	
Rural Microscopic health centre (PRM) and independent health centre (PPM)	
Urban Microscopic health centre (PRM) and independent health centre (PPM)	
Diagnosis free of charge?	Yes (for certain income groups)
Treatment supervised?	All patients in all units
Intensive phase	Health-care worker, community member
Continuation phase	Community member, family member
Category I regimen	2HRZE/4HR3
Treatment free of charge	All patients in all units
External review missions	last: 2007
	next: 2009

Political commitment

National strategic plan?	Yes (2006–2010)
Mechanism for national interagency coordination?	Yes (established 1999)
National Stop TB Partnership?	Yes (established 1999)

Financial indicators, 2009

(see final page for detailed presentation)	%
Government contribution to NTP budget (incl loans)	43
Government contribution to total cost TB control (incl loans)	46
Government health spending used for TB control	3.2
NTP budget funded	80

Per capita health financial indicators, 2009

	US$
NTP budget per capita	0.3
Total costs for TB control per capita	0.4
Funding gap per capita	0.1
Government health expenditure per capita (2005)	12
Total health expenditure per capita (2005)	26

Quality-assured bacteriology

National reference laboratory?	No (planned for 2010)

All TB laboratories performing EQA of smear microscopy or DST under the supervision of the National Reference Laboratory

	Smear				Culture		DST			
	Number	per 100 000	EQA	% adeq perf	Number	per 5 000 000	Number	per 10 000 000	EQA	% adeq perf
2007	4 855	2.1	4 855	–	41	0.9	11	0.5	3.0	–
2008	–	–	–	–	41	0.9	11	0.5	4.0	–

Note: for routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extra-pulmonary and ss–/HIV+ TB, as well as DST of re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population. EQA column shows number of laboratories for which EQA was done. Adeq perf; adequate performance for microscopy based on results of EQA.

System for managing drug supplies and laboratory equipment

	Central level			Peripheral level		
	2005	2006	2007	2005	2006	2007
Stock-outs of laboratory supplies?	–	No	No	–	No	Some units
Stock-outs of first-line anti-TB drugs?	No	No	No	–	No	No

Monitoring and evaluation system, and impact measurement

NTP publishes annual report?	Yes (since 2005)
% of BMUs reporting to next level in 2007	
Case-finding	98%
Treatment outcomes	97%

Burden and impact assessment		last	next
In-depth analysis of routine surveillance data	Yes	2007	2008
Prevalence of disease survey	Yes, national	2004	2009
Prevalence of infection survey	Yes, sub-national	2007	2012
Drug resistance survey	Yes, sub-national	2004	–
Mortality survey	Yes	2007	2012
Analysis of vital registration data	Yes	2007	2012

MDR-TB, TB/HIV AND OTHER CHALLENGES

Multidrug-resistant TB (MDR-TB)

	2005	2006	2007
	Number (% of estimated ss+ MDR-TB)		
Estimated incidence of ss+ MDR cases	6 588	6 508	6 427
Diagnosed and notified	– (–%)	59 (0.91%)	– (–%)
Registered for treatment	– (–%)	– (–%)	– (–%)
GLC	0	0	0
non-GLC	–	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES (*continued*)

Detection and treatment of HIV in TB patients, 2007

TB patients for whom the HIV test result was known	288
as % of all notified TB patients	0.1
TB patients with positive HIV test	146
as % of all estimated HIV+ TB cases	0.9
HIV+ TB patients started or continued on CPT	–
as % of HIV+ TB patients notified	–
HIV+ TB patients started or continued on ART	–
as % of HIV+ TB patients notified	–

Screening for TB in HIV-positive patients, 2007

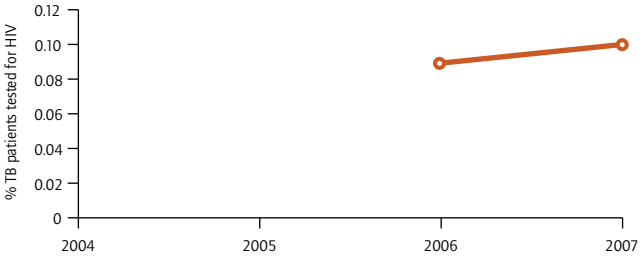
HIV+ patients in HIV care or ART register	11 141
Screened for TB	11 141
as % of HIV+ patients in HIV care or ART register	100
Started on TB treatment	5 975
as % of HIV+ patients in HIV care or ART register	54
Started on IPT	0
as % of HIV+ patients without TB in HIV care or ART register	0

High-risk groups, 2007

Number of close contacts of ss+ TB patients screened	–
Number of TB cases identified among contacts	–
% of contacts with TB	–
Contacts started on IPT	–
% of contacts without TB on IPT	–

HIV testing for TB patients

In 2007 the proportion of TB patients screened for HIV remained very low



CPT and ART for HIV-positive TB patients

Data not reported

CONTRIBUTING TO HEALTH SYSTEM STRENGTHENING

Provision of services in rural areas, and lack of coordination between public health programmes and the hospital sector, where the focus on public health is weak and user charges provide the main source of revenue, are the main health systems barriers to TB control. The NTP has strengthened the capacity of laboratories and of human resources for TB care and control in a way that has benefited the entire system. Initiatives to link hospitals are being scaled up using the ISTC; these standards are also helping to engage the hospital sector in providing general public health services.

Practical Approach to Lung Health (PAL), 2007

Number of health-care facilities providing PAL services	–	As % of total number of health-care facilities	–

ENGAGING ALL CARE PROVIDERS

Public-public and public-private approaches (PPM), 2007

Number of providers collaborating with the NTP[c]

	Number collaborating (total number of providers)	% total notified TB Diagnosed	Treated
Public sector	83 (555)	–	–
Private sector	141 (685)	–	–

International Standards for Tuberculosis Care (ISTC)

ISTC endorsed by professional organizations?	Yes
By which organizations:	–
ISTC included in medical curriculum?	Yes

EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

Advocacy, communication and social mobilization (ACSM)

The ACSM framework is aligned with the National Strategic Plan 2006–2010. Modules and guidelines on ACSM have been finalized. A KAP survey is planned for 2009.

Community participation in TB care and Patients' Charter

Communities are being involved in many parts of the country, although the form of involvement varies depending on social practices, geographical setting and the availability of stakeholders. Activities are often initiated by members of the community including traditional leaders, volunteers and health workers, as well as by various NGOs and their community workers. No data on use of the Patients' Charter were reported in 2008.

ENABLING AND PROMOTING RESEARCH

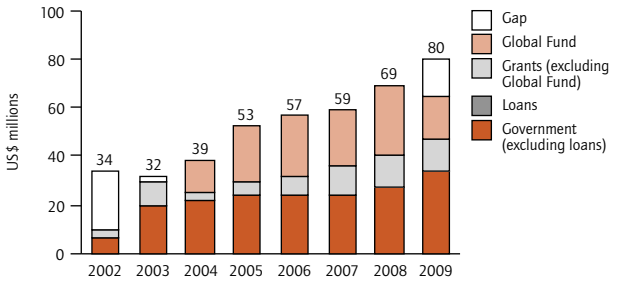
Programme-based operational research, 2007

Operational research budget (% of NTP budget)	3.6%

FINANCING

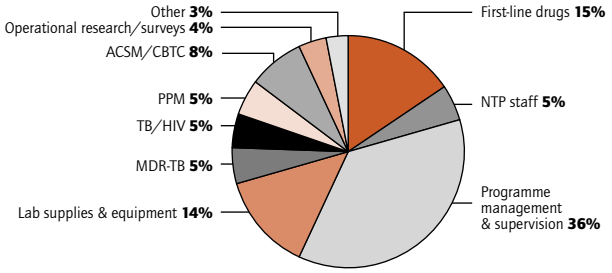
a. NTP budget by source of funding

Budget has more than doubled since 2002; increased budget in 2009 accompanied by increased government funding, but also funding gap for first time in five years



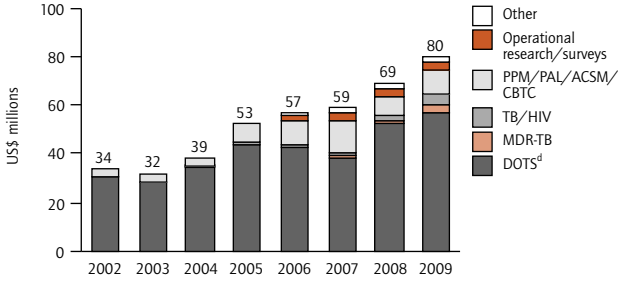
b. NTP budget line items in 2009

DOTS accounts for 70% of NTP budget; share for MDR-TB is low, although Indonesia is estimated to have the seventh highest number of MDR-TB cases globally



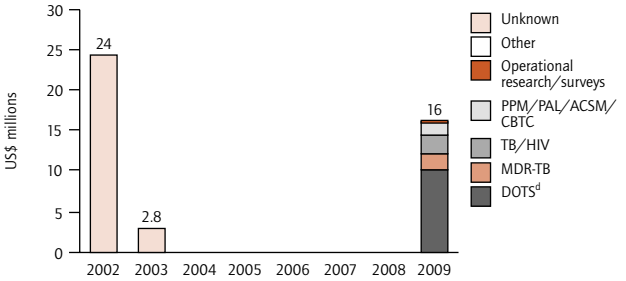
c. NTP budget by line item

Increased budget for programme management and laboratory supplies/equipment, with plans to establish 10-15 culture centres and 8 DST centres



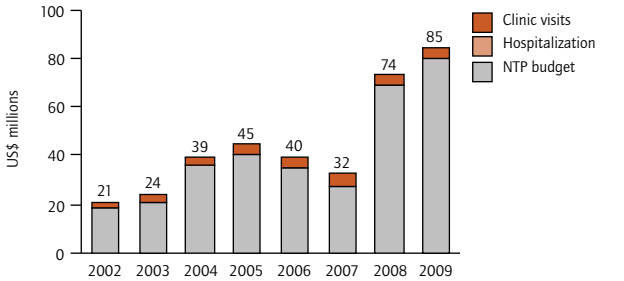
d. NTP funding gap by line item

Funding gap within DOTS mainly for laboratory equipment and EQA



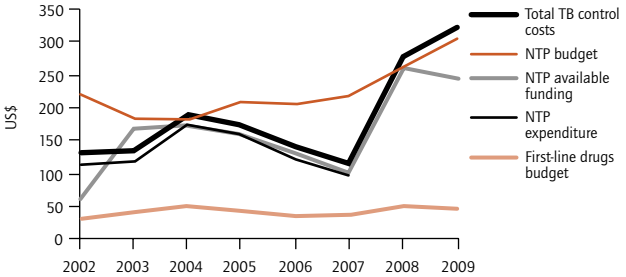
e. Total TB control costs by line item[1]

Costs for hospitalization estimated as zero; costs for clinic visits based on estimate that a new TB patient visits a health facility 16 times during treatment



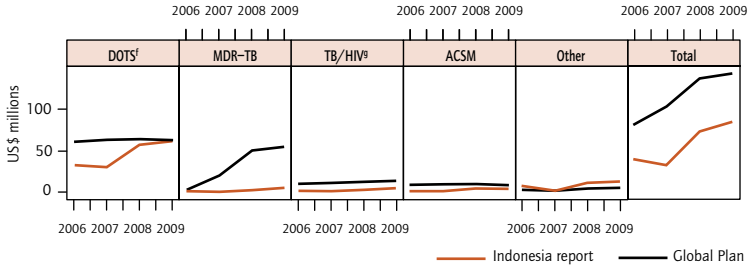
f. Per patient costs, budgets and expenditures[2]

Decreasing NTP expenditures per patient from 2004 to 2007, but will increase in 2008 and 2009 if all available funding is spent



g. Global Plan compared with country reports[e]

Country projections of funding requirements consistent with Global Plan for DOTS, but far less than Global Plan for MDR-TB because country plan for scaling-up treatment is less ambitious than targets in the Global MDR/XDR-TB Response Plan



h. NTP budget and funding gap by Stop TB Strategy component (US$ millions)

	2009 BUDGET	GAP
DOTS expansion and enhancement	57	10
TB/HIV, MDR-TB and other challenges	8.4	4.5
Health system strengthening	0.1	0.04
Engage all care providers	3.8	1.2
People with TB, and communities	6.1	0.2
Research and surveys	2.8	0.1
Other	2.5	0

SOURCES, METHODS AND ABBREVIATIONS

[a–g] Please see footnotes page 169.

[1] Total TB control costs for 2002–2007 are based on expenditure, whereas those for 2008–2009 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

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– indicates not available or not applicable; pop, population; ss+, sputum smear-positive; ss–, sputum smear-negative pulmonary; unk, pulmonary – sputum smear not done or result unknown.

Kenya

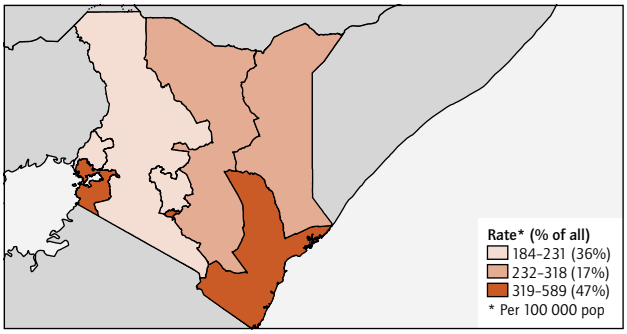
According to the latest surveillance data and estimates of TB incidence, Kenya is the first country in sub-Saharan Africa to have achieved the global targets for both case detection and treatment success. The estimates of case detection were reassessed in 2007 following a thorough review of epidemiological and programmatic data, including of new data that became available when routine HIV testing of TB patients was introduced. Collaborative TB/HIV activities are widely implemented, with 79% of notified TB patients tested for HIV and 37% of HIV-positive TB patients accessing ART in 2007. Programmatic management of MDR-TB has been initiated in Nairobi. The NTP needs to continue expanding community TB care and PPM initiatives to further improve access to treatment. The main challenges to TB control include the high turnover of health staff, including those employed at the central TB unit, and high demand for training of health-care workers.

SURVEILLANCE AND EPIDEMIOLOGY

Population (thousands)[a] 37 538

Estimates of epidemiological burden, 2007[b]	ALL	IN HIV+ PEOPLE
Incidence		
All forms of TB (thousands of new cases per year)	132	63
All forms of TB (new cases per 100 000 pop/year)	353	169
Rate of change in incidence rate (%), 2006–2007	**–4.8**	**–7.0**
New ss+ cases (thousands of new cases per year)	53	22
New ss+ cases (per 100 000 pop/year)	142	59
HIV+ incident TB cases (% of all TB cases)	48	–
Prevalence		
All forms of TB (thousands of cases)	120	32
All forms of TB (cases per 100 000 pop)	**319**	84
2015 target for prevalence (cases per 100 000 pop)	**63**	–
Mortality		
All forms of TB (thousands of deaths per year)	24	15
All forms of TB (deaths per 100 000 pop/year)	**65**	39
2015 target for mortality (deaths per 100 000 pop/year)	**13**	–
Multidrug-resistant TB (MDR-TB)		
MDR-TB among all new TB cases (%)	1.9	–
MDR-TB among previously treated TB cases (%)	7.9	–

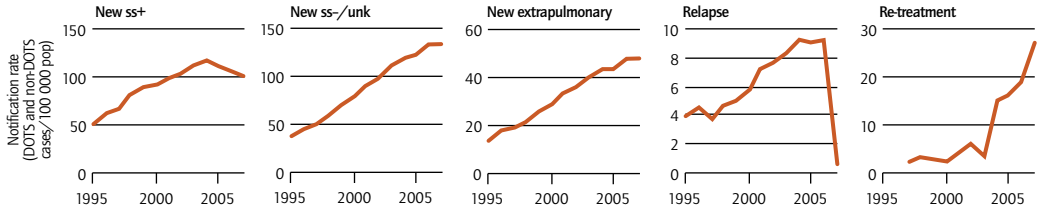
TB notification rate (new and relapse), 2007



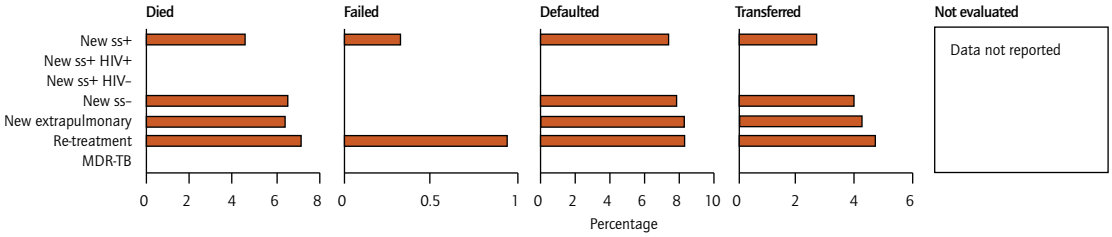
Total notifications, 2007

Notified new and relapse cases (thousands)	106
Notified new and relapse cases (per 100 000 pop/year)	284
Notified new ss+ cases (thousands)	38
Notified new ss+ cases (per 100 000 pop/year)	102
as % of new pulmonary cases	43
sex ratio (male/female)	1.4
DOTS case detection rate (% of estimated new ss+)	**72**
Notified new extrapulmonary cases (thousands)	18
as % of notified new cases	17
Notified new ss+ cases in children (<15 years) (thousands)	1.1
as % of notified new ss+ cases	2.8

Case notifications



Unfavourable treatment outcomes, 2006 cohorts



	2000	2001	2002	2003	2004	2005	2006	2007
DOTS coverage (%)	100	100	100	100	100	100	100	100
Notification rate (new & relapse cases/100 000 pop)	205	228	244	271	290	288	296	284
% notified new & relapse cases reported under DOTS	90	100	100	100	100	100	100	100
Notification rate (new ss+ cases/100 000 pop)	92	98	104	113	119	113	107	102
% notified new ss+ cases reported under DOTS	91	100	100	100	100	100	100	100
Case detection rate (all new cases, %)	49	54	56	60	64	69	77	80
Case detection rate (new ss+ cases, %)	58	61	63	65	68	70	72	72
Treatment success (new ss+ patients, %)	80	80	79	80	80	82	85	–
Re-treatment success (ss+ patients, %)	76	77	77	75	76	77	79	–

Note: notification, case detection and treatment success rates are for the whole country (i.e. DOTS and non-DOTS cases combined).

DOTS EXPANSION AND ENHANCEMENT

Overview of services for diagnosis of TB and treatment of patients

Description of basic management unit	Health centre
Number of units (DOTS/total), 2007	136/136
Location of NTP services	
Rural Dispensaries and health centres	
Urban Health centres	
NTP services part of general primary health-care network?	Yes
Location where TB diagnosed	
Rural Health centre	
Urban Health centre	
Diagnosis free of charge?	Yes (all suspects)
Treatment supervised?	All patients in all units
Intensive phase	Health-care worker, community member, family member
Continuation phase	Health-care worker, community member, family member
Category I regimen	2HRZE/4HR
Treatment free of charge	All patients in all units
External review missions	last: 2000
	next: 2009

Political commitment

National strategic plan?	Yes (2006–2010)
Mechanism for national interagency coordination?	Yes (established 2001)
National Stop TB Partnership?	No (planned 2009)

Financial indicators, 2009

(see final page for detailed presentation)	%
Government contribution to NTP budget (incl loans)	21
Government contribution to total cost TB control (incl loans)	30
Government health spending used for TB control	11
NTP budget funded	60

Per capita health financial indicators, 2009

	US$
NTP budget per capita	0.9
Total costs for TB control per capita	1.1
Funding gap per capita	0.4
Government health expenditure per capita (2005)	11
Total health expenditure per capita (2005)	24

Quality-assured bacteriology

National reference laboratory?	Yes

All TB laboratories performing EQA of smear microscopy or DST under the supervision of the National Reference Laboratory

	Smear				Culture		DST			
	Number	per 100 000	EQA	% adeq perf	Number	per 5 000 000	Number	per 10 000 000	EQA	% adeq perf
2007	930	2.5	37	100%	5	0.7	1	0.3	1.0	100%
2008	930	2.4	136	–	5	0.6	1	0.3	1.0	–

Note: for routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extra-pulmonary and ss–/HIV+ TB, as well as DST of re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population. EQA column shows number of laboratories for which EQA was done. Adeq perf; adequate performance for microscopy based on results of EQA.

System for managing drug supplies and laboratory equipment

	Central level			Peripheral level		
	2005	2006	2007	2005	2006	2007
Stock-outs of laboratory supplies?	–	No	No	–	No	No
Stock-outs of first-line anti-TB drugs?	No	No	No	No	No	No

Monitoring and evaluation system, and impact measurement

NTP publishes annual report?	Yes (since 1994)
% of BMUs reporting to next level in 2007	
Case-finding	100%
Treatment outcomes	100%

Burden and impact assessment		last	next
In-depth analysis of routine surveillance data	Yes	2007	2008
Prevalence of disease survey	No	–	–
Prevalence of infection survey	Yes, sub-national	2007	2009
Drug resistance survey	Yes, sub-national	1995	2009
Mortality survey	No	–	–
Analysis of vital registration data	No	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES

Multidrug-resistant TB (MDR-TB)

	2005	2006	2007
	Number (% of estimated ss+ MDR-TB)		
Estimated incidence of ss+ MDR cases	2 196	2 060	2 016
Diagnosed and notified	44 (2.0%)	89 (4.3%)	82 (4.1%)
Registered for treatment	– (–%)	– (–%)	6 (0.30%)
GLC	0	0	0
non-GLC	–	–	6

MDR-TB, TB/HIV AND OTHER CHALLENGES (*continued*)

Detection and treatment of HIV in TB patients, 2007

TB patients for whom the HIV test result was known	91 841
as % of all notified TB patients	79
TB patients with positive HIV test	43 954
as % of all estimated HIV+ TB cases	69
HIV+ TB patients started or continued on CPT	51,731
as % of HIV+ TB patients notified	100
HIV+ TB patients started or continued on ART	16 324
as % of HIV+ TB patients notified	37

Screening for TB in HIV-positive patients, 2007

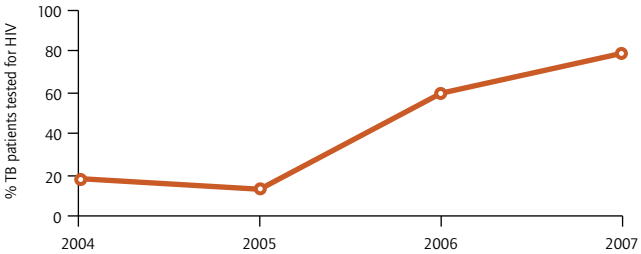
HIV+ patients in HIV care or ART register	461 483
Screened for TB	–
as % of HIV+ patients in HIV care or ART register	–
Started on TB treatment	–
as % of HIV+ patients in HIV care or ART register	–
Started on IPT	–
as % of HIV+ patients without TB in HIV care or ART register	–

High-risk groups, 2007

Number of close contacts of ss+ TB patients screened	–
Number of TB cases identified among contacts	–
% of contacts with TB	–
Contacts started on IPT	–
% of contacts without TB on IPT	–

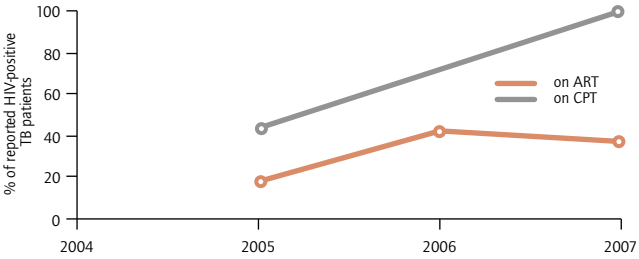
HIV testing for TB patients

The proportion of TB patients screened for HIV continues to increase steadily, reaching 79% in 2007



CPT and ART for HIV-positive TB patients

The proportion of HIV-positive TB patients receiving ART declined slightly in 2007; no data on the provision of CPT were reported for 2006



CONTRIBUTING TO HEALTH SYSTEM STRENGTHENING

The capacity and coverage of the NTP have been improved through gradual integration into the primary health-care system. The NTP has also successfully engaged NGOs, FBOs, the business sector and the private sector in creating coordinated mechanisms for the delivery of TB control and, in the future, other public health interventions.

Practical Approach to Lung Health (PAL), 2007

Number of health-care facilities providing PAL services	0	As % of total number of health-care facilities	0

ENGAGING ALL CARE PROVIDERS

Public-public and public-private approaches (PPM), 2007

Number of providers collaborating with the NTP[c]

	Number collaborating (total number of providers)	% total notified TB Diagnosed	Treated
Public sector	222 (296)	–	–
Private sector	382 (–)	–	–

International Standards for Tuberculosis Care (ISTC)

ISTC endorsed by professional organizations?	Yes
By which organizations:	KAPTLD-Kenya Association for the Prevention of TB and Lung Disease, KMA-Kenya Medical Association, KPA-Kenya Paediatric Association
ISTC included in medical curriculum?	No

EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

Advocacy, communication and social mobilization (ACSM)

An ACSM unit within the Division of Leprosy, TB and Lung Disease in the Ministry of Health has been established. A KAP survey is planned for 2008.

Community participation in TB care and Patients' Charter

Of 136 basic management units, 41 offer community-based treatment support. Patients in whom TB is diagnosed choose a relative, a friend or a neighbour to provide support during their treatment. In areas where community-based activities have been implemented, community health workers give talks about TB in the community, refer suspects for TB testing and trace defaulters. No data on use of the Patients' Charter were reported in 2008.

ENABLING AND PROMOTING RESEARCH

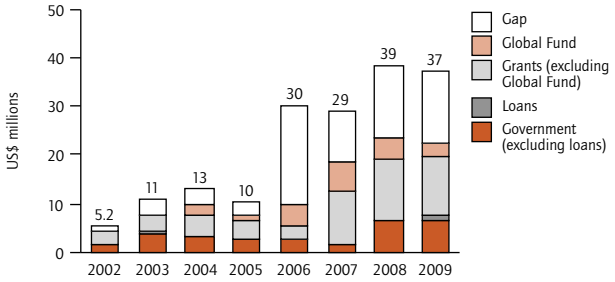
Programme-based operational research, 2007

Operational research budget (% of NTP budget)	1.3%

FINANCING

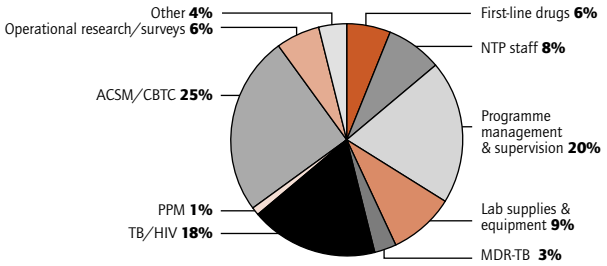
a. NTP budget by source of funding

Greatly increased NTP budget since 2005; while funding has also grown substantially from both government and grants, large funding gaps remain



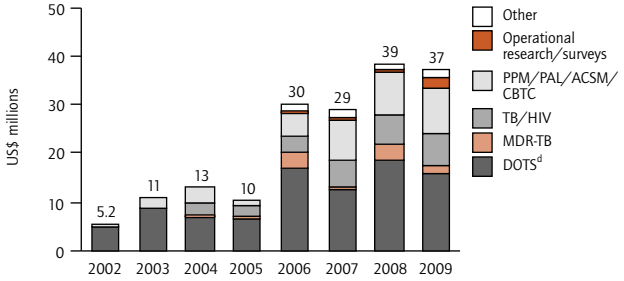
b. NTP budget line items in 2009

Large share of budget is for DOTS (43%) and TB/HIV (18%); share of budget for ACSM and community TB care is higher than in most other HBCs



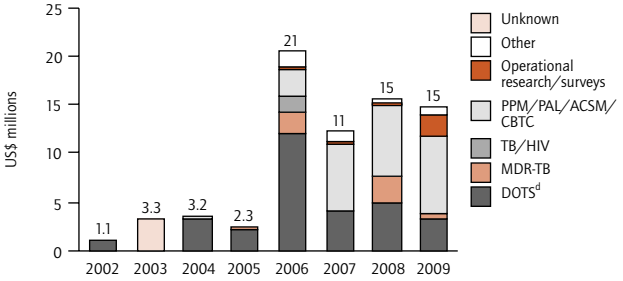
c. NTP budget by line item

Increased budget for NTP staff, laboratory supplies and equipment, and MDR-TB (mostly to ensure appropriate infection control in one inpatient facility) in 2008–2009; disease prevalence survey included in budget for 2009



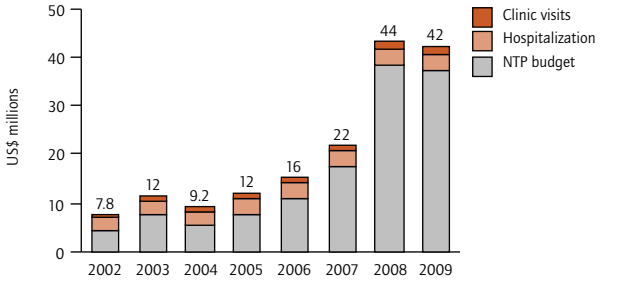
d. NTP funding gap by line item

Biggest funding gap is for ACSM; disease prevalence survey planned for 2009–2010 is also not funded



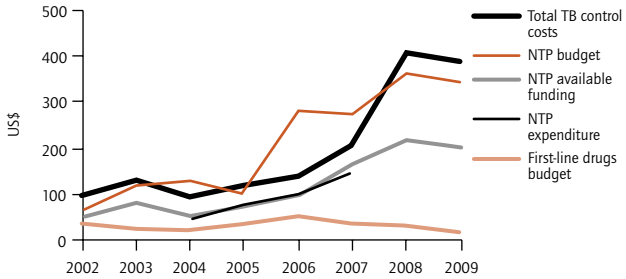
e. Total TB control costs by line item[1]

Hospitalization costs are for 2000 dedicated TB beds



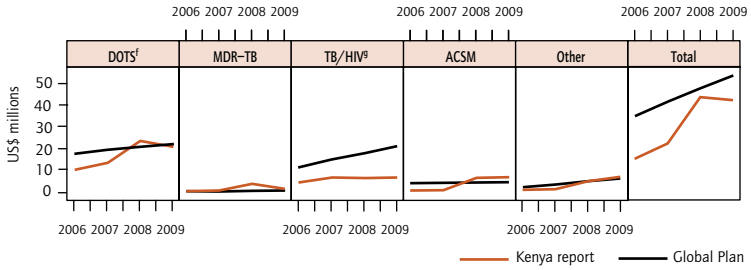
f. Per patient costs, budgets and expenditures[2]

Increased costs, budget, available funding and expenditures per patient; expenditure and available funding are very similar



g. Global Plan compared with country reports[e]

Country plan for 2008–2009 in line with Global Plan, including TB/HIV activities (although some TB/HIV costs are not part of the NTP budget, which explains the lower funding in the country report)



h. NTP budget and funding gap by Stop TB Strategy component (US$ millions)

	2009 BUDGET	GAP
DOTS expansion and enhancement	16	3.1
TB/HIV, MDR-TB and other challenges	7.9	0.5
Health system strengthening	0	0
Engage all care providers	0.3	0.01
People with TB, and communities	9.2	8.0
Research and surveys	2.4	2.4
Other	1.4	0.8

SOURCES, METHODS AND ABBREVIATIONS

[a–g] Please see footnotes page 169.

[1] Total TB control costs for 2002–2003 are based on available funding, whereas those for 2004–2007 are based on expenditure, and those for 2008–2009 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

[2] NTP available funding for 2004–2007 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003 and 2008–2009 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.

– indicates not available or not applicable; pop, population; ss+, sputum smear-positive; ss–, sputum smear-negative pulmonary; unk, pulmonary – sputum smear not done or result unknown.

Mozambique

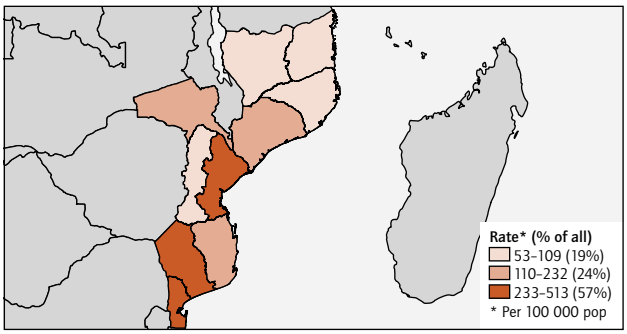
Although the case detection rate has been increasing, the detection rate of new smear-positive cases remains below 50%. Treatment success rates continue to be below target for both new and re-treatment cases. While all districts are implementing DOTS, access to health care is poor given the limitations of the health system infrastructure. Collaborative TB/HIV activities are expanding; in 2007, 70% of notified TB cases were tested for HIV, 33% of HIV-positive patients were put on ART and 93% were given CPT. Programmatic management of MDR-TB has begun. Increased financial flows from the Global Fund and other donors have alleviated funding constraints. However, the shortage of a skilled workforce, slow funding disbursements and weak absorptive capacity continue to limit programme implementation.

SURVEILLANCE AND EPIDEMIOLOGY

Population (thousands)[a] 21 397

Estimates of epidemiological burden, 2007[b]	ALL	IN HIV+ PEOPLE
Incidence		
All forms of TB (thousands of new cases per year)	92	44
All forms of TB (new cases per 100 000 pop/year)	431	204
Rate of change in incidence rate (%), 2006–2007	**–2.6**	**–1.8**
New ss+ cases (thousands of new cases per year)	37	15
New ss+ cases (per 100 000 pop/year)	174	71
HIV+ incident TB cases (% of all TB cases)	47	–
Prevalence		
All forms of TB (thousands of cases)	108	22
All forms of TB (cases per 100 000 pop)	**504**	102
2015 target for prevalence (cases per 100 000 pop)	**144**	–
Mortality		
All forms of TB (thousands of deaths per year)	27	17
All forms of TB (deaths per 100 000 pop/year)	**127**	82
2015 target for mortality (deaths per 100 000 pop/year)	**18**	–
Multidrug-resistant TB (MDR-TB)		
MDR-TB among all new TB cases (%)	3.5	–
MDR-TB among previously treated TB cases (%)	3.3	–

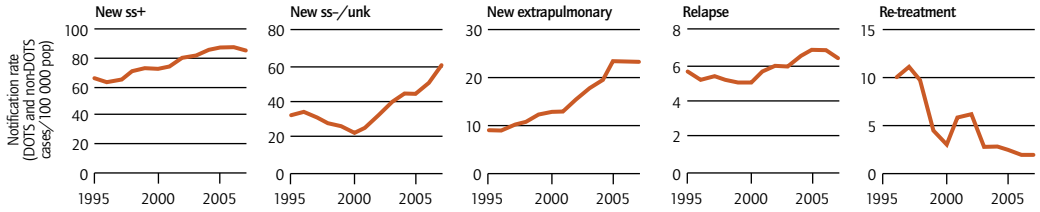
TB notification rate (new and relapse), 2007



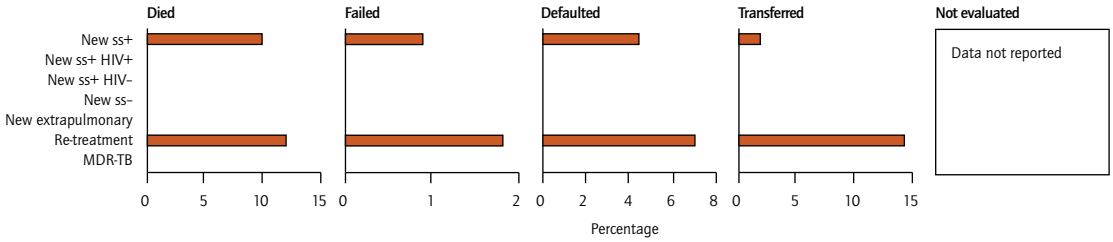
Total notifications, 2007

Notified new and relapse cases (thousands)	38
Notified new and relapse cases (per 100 000 pop/year)	176
Notified new ss+ cases (thousands)	18
Notified new ss+ cases (per 100 000 pop/year)	85
as % of new pulmonary cases	58
sex ratio (male/female)	–
DOTS case detection rate (% of estimated new ss+)	**49**
Notified new extrapulmonary cases (thousands)	5.0
as % of notified new cases	14
Notified new ss+ cases in children (<15 years) (thousands)	0.3
as % of notified new ss+ cases	1.8

Case notifications



Unfavourable treatment outcomes, 2006 cohorts



	2000	2001	2002	2003	2004	2005	2006	2007
DOTS coverage (%)	100	100	100	100	100	100	100	100
Notification rate (new & relapse cases/100 000 pop)	116	118	133	146	155	162	168	176
% notified new & relapse cases reported under DOTS	100	100	100	100	100	100	100	100
Notification rate (new ss+ cases/100 000 pop)	73	75	80	82	85	87	87	85
% notified new ss+ cases reported under DOTS	100	100	100	100	100	100	100	100
Case detection rate (all new cases, %)	28	28	29	31	32	34	36	39
Case detection rate (new ss+ cases, %)	47	45	45	45	46	47	49	49
Treatment success (new ss+ patients, %)	75	78	78	76	77	79	83	–
Re-treatment success (ss+ patients, %)	71	68	67	68	–	70	65	–

Note: notification, case detection and treatment success rates are for the whole country (i.e. DOTS and non-DOTS cases combined).

DOTS EXPANSION AND ENHANCEMENT

Overview of services for diagnosis of TB and treatment of patients

Description of basic management unit	Centro de saude urbano-Sede (at BMU head-office level)
Number of units (DOTS/total), 2007	169/169
Location of NTP services	
Rural Centro de saude rural (rural health facility)	
Urban Centro de saude urbano (urban health facility)	
NTP services part of general primary health-care network?	Yes
Location where TB diagnosed	
Rural Centro de saude rural-Sede (at BMU head-office level)	
Urban Centro de saude urbano-Sede (at BMU head-office level)	
Diagnosis free of charge?	Yes (all suspects)
Treatment supervised?	All patients in all units
Intensive phase	Health-care worker, community member, family member
Continuation phase	Health-care worker, community member, family member
Category I regimen	2(HRZE)/4(HR)
Treatment free of charge	All patients in all units
External review missions	last: 2006
	next: 2009

Political commitment

National strategic plan?	Yes (2008–2012)
Mechanism for national interagency coordination?	Yes (established 2007)
National Stop TB Partnership?	No (planned 2009)

Financial indicators, 2009

(see final page for detailed presentation)	%
Government contribution to NTP budget (incl loans)	26
Government contribution to total cost TB control (incl loans)	40
Government health spending used for TB control	16
NTP budget funded	76

Per capita health financial indicators, 2009

	US$
NTP budget per capita	1.1
Total costs for TB control per capita	1.4
Funding gap per capita	0.3
Government health expenditure per capita (2005)	9.2
Total health expenditure per capita (2005)	15

Quality-assured bacteriology

National reference laboratory?	Yes

All TB laboratories performing EQA of smear microscopy or DST under the supervision of the National Reference Laboratory

	Smear				Culture		DST			
	Number	per 100 000	EQA	% adeq perf	Number	per 5 000 000	Number	per 10 000 000	EQA	% adeq perf
2007	252	1.2	252	97%	1	0.2	1	0.5	1.0	100%
2008	252	1.2	252	–	3	0.7	1	0.5	1.0	–

Note: for routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extra-pulmonary and ss–/HIV+ TB, as well as DST of re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population. EQA column shows number of laboratories for which EQA was done. Adeq perf; adequate performance for microscopy based on results of EQA.

System for managing drug supplies and laboratory equipment

	Central level			Peripheral level		
	2005	2006	2007	2005	2006	2007
Stock-outs of laboratory supplies?	–	No	Yes	–	No	Some units
Stock-outs of first-line anti-TB drugs?	Yes	No	No	Yes	No	Some units

Monitoring and evaluation system, and impact measurement

NTP publishes annual report?	Yes (since 2006)
% of BMUs reporting to next level in 2007	
Case-finding	100%
Treatment outcomes	100%

Burden and impact assessment		last	next
In-depth analysis of routine surveillance data	Yes	2006	2009
Prevalence of disease survey	No	–	–
Prevalence of infection survey	No	–	–
Drug resistance survey	Yes, national	1999	2008
Mortality survey	No	–	–
Analysis of vital registration data	No	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES

Multidrug-resistant TB (MDR-TB)

	2005	2006	2007
	Number (% of estimated ss+ MDR-TB)		
Estimated incidence of ss+ MDR cases	1 482	1 474	1 464
Diagnosed and notified	115 (7.8%)	129 (8.8%)	163 (11%)
Registered for treatment	77 (5.2%)	129 (8.8%)	163 (11%)
GLC	0	0	0
non-GLC	77	129	163

MDR-TB, TB/HIV AND OTHER CHALLENGES (*continued*)

Detection and treatment of HIV in TB patients, 2007

TB patients for whom the HIV test result was known	26 548
as % of all notified TB patients	70
TB patients with positive HIV test	12 563
as % of all estimated HIV+ TB cases	29
HIV+ TB patients started or continued on CPT	11 667
as % of HIV+ TB patients notified	93
HIV+ TB patients started or continued on ART	4 105
as % of HIV+ TB patients notified	33

Screening for TB in HIV-positive patients, 2007

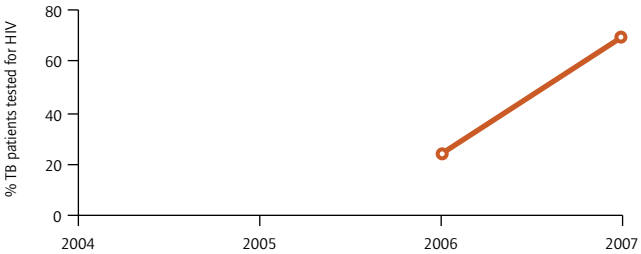
HIV+ patients in HIV care or ART register	326 517
Screened for TB	3 039
as % of HIV+ patients in HIV care or ART register	0.9
Started on TB treatment	12 857
as % of HIV+ patients in HIV care or ART register	3.9
Started on IPT	676
as % of HIV+ patients without TB in HIV care or ART register	0.2

High-risk groups, 2007

Number of close contacts of ss+ TB patients screened	–
Number of TB cases identified among contacts	–
% of contacts with TB	–
Contacts started on IPT	–
% of contacts without TB on IPT	–

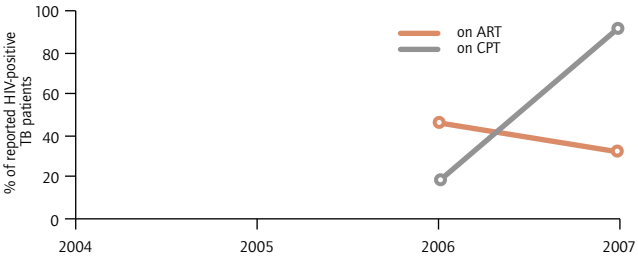
HIV testing for TB patients

Between 2006 and 2007 the proportion of TB patients screened for HIV almost tripled



CPT and ART for HIV-positive TB patients

The proportion of HIV-positive TB patients receiving ART has declined while the proportion of those receiving CPT has increased dramatically



CONTRIBUTING TO HEALTH SYSTEM STRENGTHENING

The main health systems barriers affecting TB control are a shortage of skilled human resources for health and poor access to the primary health-care system into which the NTP is integrated. Improvements in laboratory capacity and training of human resources are benefiting both the NTP and the primary health-care system.

Practical Approach to Lung Health (PAL), 2007

Number of health-care facilities providing PAL services	–	As % of total number of health-care facilities	–

ENGAGING ALL CARE PROVIDERS

Public-public and public-private approaches (PPM), 2007

Number of providers collaborating with the NTP[c]

	Number collaborating (total number of providers)	% total notified TB Diagnosed	Treated
Public sector	41 (41)	0.9	0.9
Private sector	5 (–)	–	–

International Standards for Tuberculosis Care (ISTC)

ISTC endorsed by professional organizations?	No
ISTC included in medical curriculum?	No

EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

Advocacy, communication and social mobilization (ACSM)

Community forums were organized during World TB Day 2008. A KAP survey is planned for 2009.

Community participation in TB care and Patients' Charter

Community-based activities are continuing through an NGO that supports the NTP. Community volunteers have been trained to provide treatment support, contact tracing, sputum transport and awareness-raising activities, in rural areas. There are volunteers in many districts, but the initiative has not been implemented uniformly. Plans to expand geographical coverage and involve other partners are ongoing. The Patients' Charter is not yet in use.

ENABLING AND PROMOTING RESEARCH

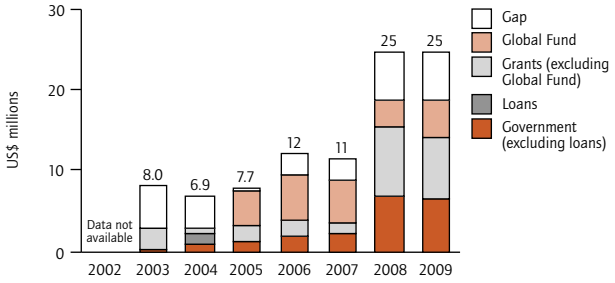
Programme-based operational research, 2007

Operational research budget (% of NTP budget)	0.6 %

FINANCING

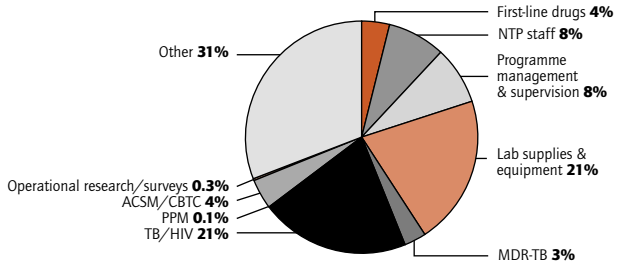
a. NTP budget by source of funding

Greatly increased budget since 2007 following re-assessment of funding needs in line with Stop TB Strategy; funding has also grown from government and donors including the Global Fund (round 7) and USAID



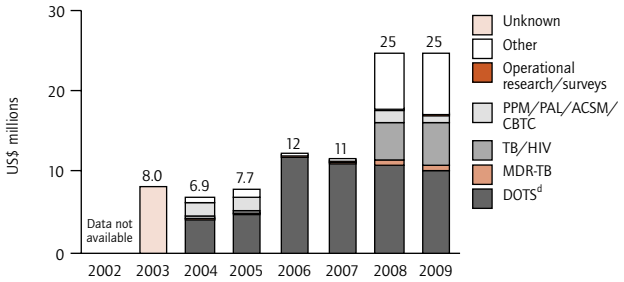
b. NTP budget line items in 2009

Largest components of budget are DOTS (41%), Other (31%) and collaborative TB/HIV activities (21%)



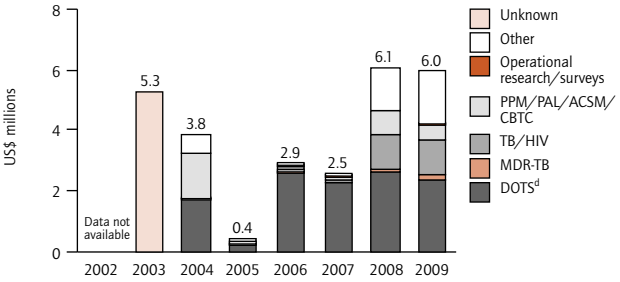
c. NTP budget by line item

Increased budget for TB/HIV, and within Other, increased budget for high-risk groups (prisoners) and childhood TB; budget within DOTS includes establishment of two regional reference laboratories and purchase of new laboratory equipment



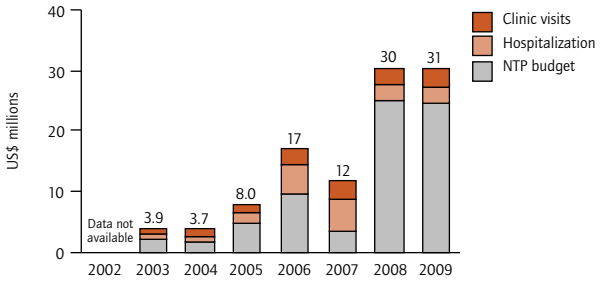
d. NTP funding gap by line item

Funding gap within DOTS mainly for laboratory supplies and equipment, and routine programme management



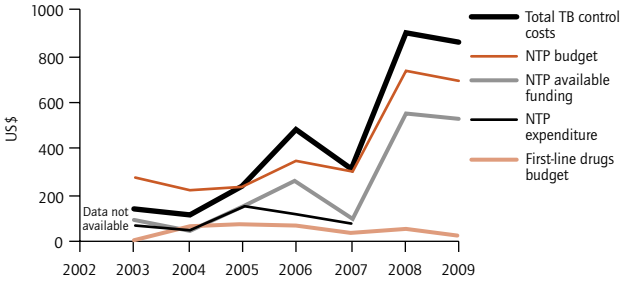
e. Total TB control costs by line item[1]

Hospitalization costs 2008–2009 based on reduced number of dedicated TB beds (from 4512 to 2258) in the country; outpatient costs based on 90 visits to a health facility per new TB patient during treatment



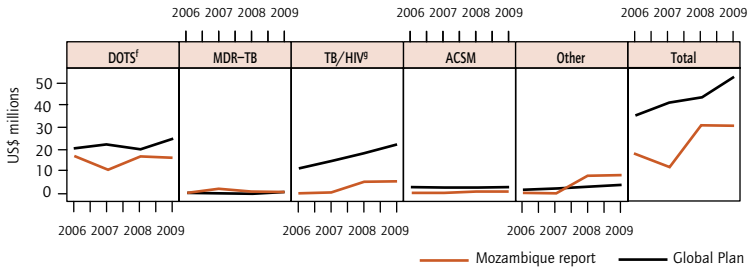
f. Per patient costs, budgets and expenditures[2]

Large fluctuation in available funding per patient



g. Global Plan compared with country reports[e]

Implementation of TB control behind Global Plan 2006–2007 but country assessment of funding required 2008–2009 in line with Global Plan – difference for TB/HIV is due to some activities being funded and implemented by national HIV/AIDS control programme



h. NTP budget and funding gap by Stop TB Strategy component (US$ millions)

	2009 BUDGET	GAP
DOTS expansion and enhancement	10	2.4
TB/HIV, MDR-TB and other challenges	5.9	1.3
Health system strengthening	0	0
Engage all care providers	0.02	0.02
People with TB, and communities	0.9	0.4
Research and surveys	0.1	0.05
Other	7.6	1.8

SOURCES, METHODS AND ABBREVIATIONS

[a–g] Please see footnotes page 169.

[1] Total TB control costs for 2003–2005 and 2007 are based on expenditure, whereas those for 2006 are based on available funding, and those for 2008–2009 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

[2] NTP available funding for 2004–2005 and 2007 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003, 2006 and 2008–2009 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.

– indicates not available or not applicable; pop, population; ss+, sputum smear-positive; ss–, sputum smear-negative pulmonary; unk, pulmonary – sputum smear not done or result unknown.

Myanmar

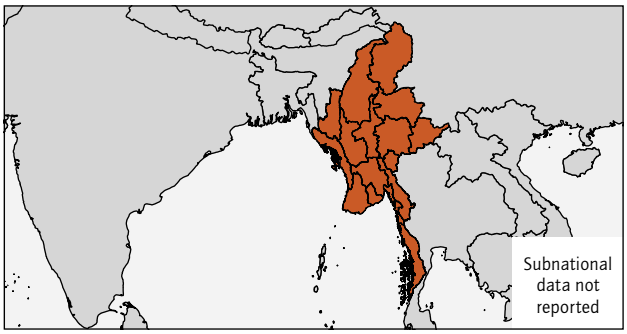
Results from the prevalence survey in Yangon and increasing case notifications in the FIDELIS project suggest that the TB burden in Myanmar is underestimated and that current estimates need to be reviewed. A GLC-approved MDR-TB project and a project providing IPT for HIV-positive people began in 2008. Data from the second national drug resistance survey will be available in 2009; TB/HIV surveillance data indicate that 11% of TB patients are coinfected with HIV. Cohort review meetings have been expanded across poorly performing townships alongside innovative activities for improved case-finding, including sputum collection points, mobile teams and contact tracing. PPM-DOTS has been scaled up to more than 150 out of 325 townships. The large budget gap for TB control and uncertainty about the supply of first-line anti-TB drugs beyond 2009 remain major challenges.

SURVEILLANCE AND EPIDEMIOLOGY

Population (thousands)[a] 48 798

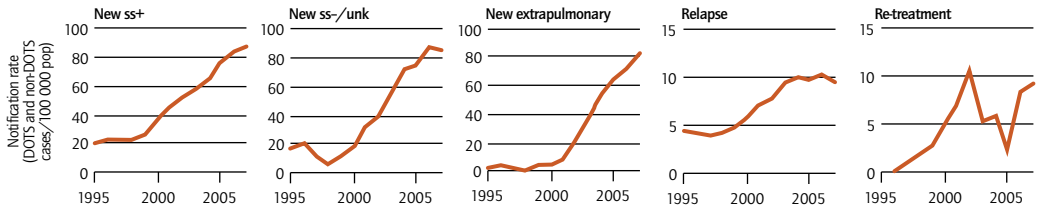
Estimates of epidemiological burden, 2007[b]	ALL	IN HIV+ PEOPLE
Incidence		
All forms of TB (thousands of new cases per year)	83	9.1
All forms of TB (new cases per 100 000 pop/year)	171	19
Rate of change in incidence rate (%), 2006–2007	**0**	**–4.8**
New ss+ cases (thousands of new cases per year)	37	3.2
New ss+ cases (per 100 000 pop/year)	75	6.5
HIV+ incident TB cases (% of all TB cases)	11	–
Prevalence		
All forms of TB (thousands of cases)	79	4.6
All forms of TB (cases per 100 000 pop)	**162**	9.3
2015 target for prevalence (cases per 100 000 pop)	**206**	–
Mortality		
All forms of TB (thousands of deaths per year)	6.3	0.9
All forms of TB (deaths per 100 000 pop/year)	**13**	1.9
2015 target for mortality (deaths per 100 000 pop/year)	**26**	–
Multidrug-resistant TB (MDR-TB)		
MDR-TB among all new TB cases (%)	4.0	–
MDR-TB among previously treated TB cases (%)	16	–

TB notification rate (new and relapse), 2007

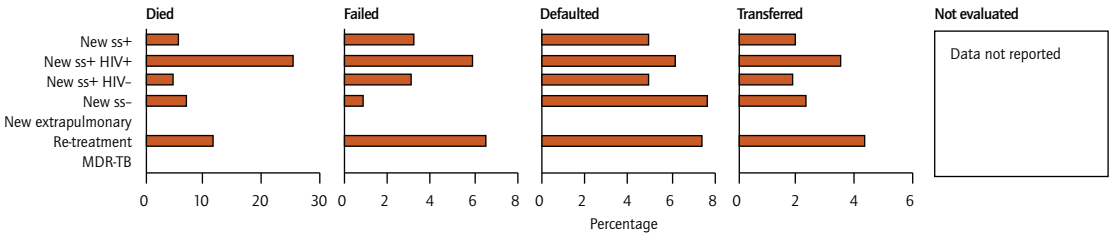


Total notifications, 2007	
Notified new and relapse cases (thousands)	129
Notified new and relapse cases (per 100 000 pop/year)	265
Notified new ss+ cases (thousands)	43
Notified new ss+ cases (per 100 000 pop/year)	87
as % of new pulmonary cases	50
sex ratio (male/female)	1.9
DOTS case detection rate (% of estimated new ss+)	**116**
Notified new extrapulmonary cases (thousands)	40
as % of notified new cases	32
Notified new ss+ cases in children (<15 years) (thousands)	0.3
as % of notified new ss+ cases	0.7

Case notifications



Unfavourable treatment outcomes, 2006 cohorts



	2000	2001	2002	2003	2004	2005	2006	2007
DOTS coverage (%)	77	84	88	95	95	95	95	95
Notification rate (new & relapse cases/100 000 pop)	67	92	122	161	203	223	253	265
% notified new & relapse cases reported under DOTS	100	96	100	100	100	100	100	100
Notification rate (new ss+ cases/100 000 pop)	38	46	52	58	66	76	83	87
% notified new ss+ cases reported under DOTS	100	98	100	100	100	100	100	100
Case detection rate (all new cases, %)	36	50	67	88	113	125	142	149
Case detection rate (new ss+ cases, %)	50	61	69	78	88	102	111	116
Treatment success (new ss+ patients, %)	82	81	81	81	84	84	84	–
Re-treatment success (ss+ patients, %)	74	74	75	70	74	71	70	–

Note: notification, case detection and treatment success rates are for the whole country (i.e. DOTS and non-DOTS cases combined).

DOTS EXPANSION AND ENHANCEMENT

Overview of services for diagnosis of TB and treatment of patients

Description of basic management unit	Township TB centre
Number of units (DOTS/total), 2007	314/324
Location of NTP services	
Rural	Rural health centre for drug distribution only
Urban	Township TB centre
NTP services part of general primary health-care network?	Yes
Location where TB diagnosed	
Rural	Township TB centre
Urban	Township TB centre
Diagnosis free of charge?	Yes (all suspects)
Treatment supervised?	All patients in all units
Intensive phase	Health-care worker, community member, family member
Continuation phase	Health-care worker, community member, family member
Category I regimen	2(HRZE)/4(HR)
Treatment free of charge	All patients in all units
External review missions	last: 2007
	next: 2010

Political commitment

National strategic plan?	Yes (2006–2010)
Mechanism for national interagency coordination?	Yes (established 2000)
National Stop TB Partnership?	No (planned 2009)

Financial indicators, 2009

(see final page for detailed presentation)	%
Government contribution to NTP budget (incl loans)	11
Government contribution to total cost TB control (incl loans)	25
Government health spending used for TB control	62
NTP budget funded	60

Per capita health financial indicators, 2009

	US$
NTP budget per capita	0.2
Total costs for TB control per capita	0.3
Funding gap per capita	0.1
Government health expenditure per capita (2005)	0.4
Total health expenditure per capita (2005)	4.0

Quality-assured bacteriology

National reference laboratory?	Yes

All TB laboratories performing EQA of smear microscopy or DST under the supervision of the National Reference Laboratory

	Smear				Culture		DST			
	Number	per 100 000	EQA	% adeq perf	Number	per 5 000 000	Number	per 10 000 000	EQA	% adeq perf
2007	324	0.7	54	52%	2	0.2	1	0.2	–	–
2008	324	0.7	324	–	2	0.2	1	0.2	–	–

Note: for routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extra-pulmonary and ss–/HIV+ TB, as well as DST of re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population. EQA column shows number of laboratories for which EQA was done. Adeq perf; adequate performance for microscopy based on results of EQA.

System for managing drug supplies and laboratory equipment

	Central level			Peripheral level		
	2005	2006	2007	2005	2006	2007
Stock-outs of laboratory supplies?	–	No	No	–	No	No
Stock-outs of first-line anti-TB drugs?	No	No	No	No	No	No

Monitoring and evaluation system, and impact measurement

NTP publishes annual report?	Yes (since 1995)
% of BMUs reporting to next level in 2007	
Case-finding	97%
Treatment outcomes	97%

Burden and impact assessment		last	next
In-depth analysis of routine surveillance data	Yes	2007	2008
Prevalence of disease survey	Yes	2006	2009
Prevalence of infection survey	No	–	–
Drug resistance survey	Yes, national	2003	–
Mortality survey	No	–	–
Analysis of vital registration data	No	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES

Multidrug-resistant TB (MDR-TB)

	2005	2006	2007
	Number (% of estimated ss+ MDR-TB)		
Estimated incidence of ss+ MDR cases	2 287	2 309	2 331
Diagnosed and notified	– (–%)	666 (29%)	600 (26%)
Registered for treatment	– (–%)	– (–%)	– (–%)
GLC	0	0	0
non-GLC	–	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES (*continued*)

Detection and treatment of HIV in TB patients, 2007

TB patients for whom the HIV test result was known	2 825
as % of all notified TB patients	2.1
TB patients with positive HIV test	873
as % of all estimated HIV+ TB cases	9.6
HIV+ TB patients started or continued on CPT	846
as % of HIV+ TB patients notified	97
HIV+ TB patients started or continued on ART	437
as % of HIV+ TB patients notified	50

Screening for TB in HIV-positive patients, 2007

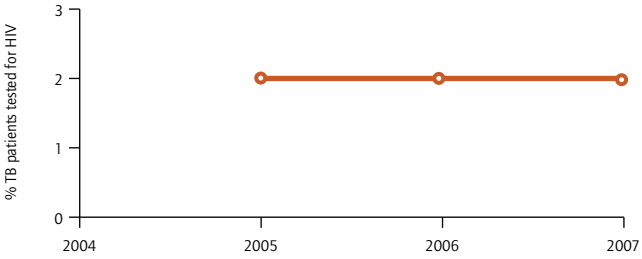
HIV+ patients in HIV care or ART register	–
Screened for TB	–
as % of HIV+ patients in HIV care or ART register	–
Started on TB treatment	–
as % of HIV+ patients in HIV care or ART register	–
Started on IPT	–
as % of HIV+ patients without TB in HIV care or ART register	–

High-risk groups, 2007

Number of close contacts of ss+ TB patients screened	–
Number of TB cases identified among contacts	–
% of contacts with TB	–
Contacts started on IPT	–
% of contacts without TB on IPT	–

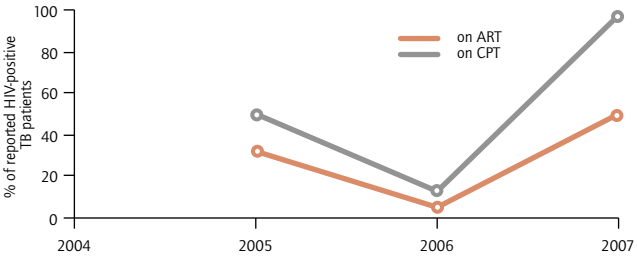
HIV testing for TB patients

The proportion of TB patients screened for HIV was low and stable from 2005 to 2007



CPT and ART for HIV-positive TB patients

The proportion of HIV-positive TB patients receiving ART and CPT increased from 2005, reaching 50% and 97% in 2007 respectively



CONTRIBUTING TO HEALTH SYSTEM STRENGTHENING

The national health system operates under severe resource constraints, with limited human resources and poor outreach services in some areas. The NTP, in conjunction with the HIV and malaria control programmes, is attempting to improve the management of general health systems and supervisory and delivery capacity at the township level, with funding from the Three Diseases Fund. The NTP is also scaling up initiatives to engage the private sector in TB control and is helping to improve the capacity of the Myanmar Medical Association to provide services for public health.

Practical Approach to Lung Health (PAL), 2007

Number of health-care facilities providing PAL services	–	As % of total number of health-care facilities	–

ENGAGING ALL CARE PROVIDERS

Public-public and public-private approaches (PPM), 2007

Number of providers collaborating with the NTP[c]

	Number collaborating (total number of providers)	% total notified TB Diagnosed	Treated
Public sector	4 (365)	0.1	0.1
Private sector	856 (–)	9.1	9.1

International Standards for Tuberculosis Care (ISTC)

ISTC endorsed by professional organizations?	No
ISTC included in medical curriculum?	No

EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

Advocacy, communication and social mobilization (ACSM)

A KAP survey is planned for 2009.

Community participation in TB care and Patients' Charter

The community is involved in all basic management units in the country, although not in all health centres. Involvement has been initiated through public health centres and NGOs, which organize community-based treatment support, sensitization activities and referral of suspects. The presence of community health workers and various NGOs throughout the country mean that there is potential for countrywide coverage of community-based TB care. No data on use of the Patients' Charter were reported in 2008.

ENABLING AND PROMOTING RESEARCH

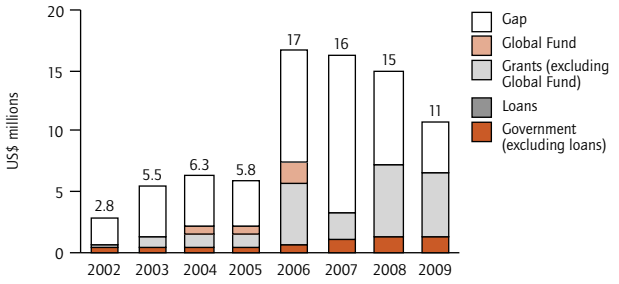
Programme-based operational research, 2007

Operational research budget (% of NTP budget)	0.8%

FINANCING

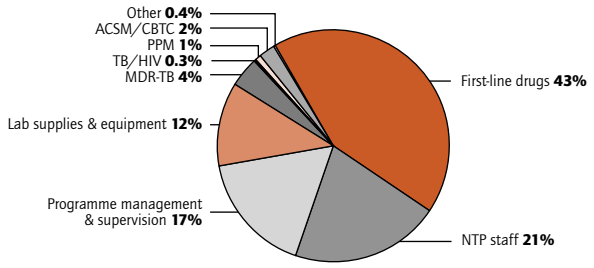
a. NTP budget by source of funding

Increased funding from 2006 from Three Diseases Fund, but large funding gaps remain



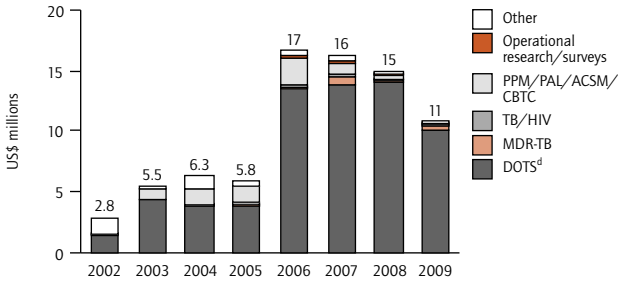
b. NTP budget line items in 2009

Almost all (92%) of the budget is for DOTS implementation



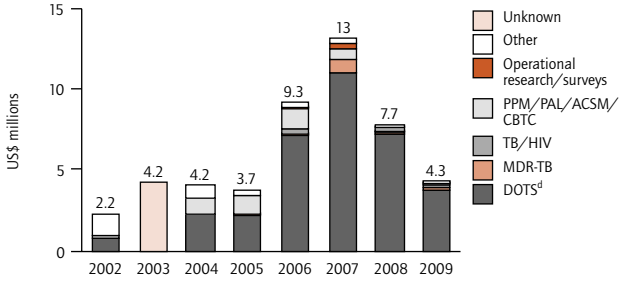
c. NTP budget by line item

Decreased budget in 2009 mainly because buffer stock of first-line drugs was included in 2008 budget



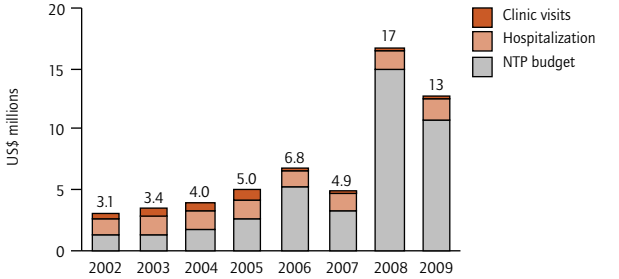
d. NTP funding gap by line item

Funding gap within DOTS mainly for first-line drugs, routine programme management and supervision, and dedicated NTP staff



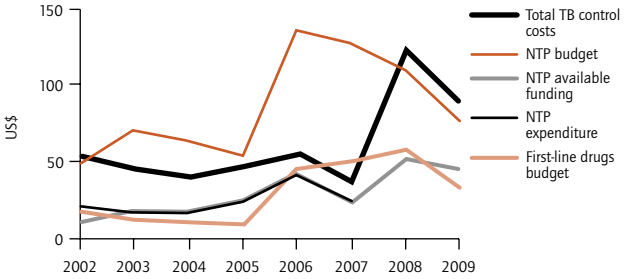
e. Total TB control costs by line item[1]

Hospitalization costs are for 1500 dedicated TB beds; costs for clinic visits based on 28 clinic visits during TB treatment for 2002–2005 and 3 visits for 2006–2009, reflecting more reliance on community-based DOT



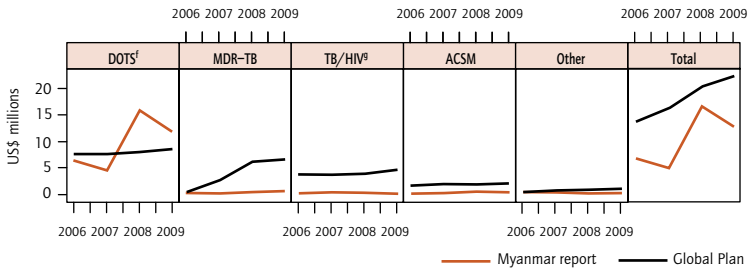
f. Per patient costs, budgets and expenditures[2]

High first-line drugs budget per patient 2006–2008 reflects planned purchase of buffer stock; expenditures almost the same as available funding suggesting good absorption capacity



g. Global Plan compared with country reports[e]

Country implementation behind Global Plan targets (2006–2007), in part due to lack of funds; country assessment of funding required for DOTS 2008–2009 higher than Global Plan due to higher projections of patients to be treated; country plan for scaling up MDR-TB treatment has less ambitious targets than the Global MDR/XDR-TB Response Plan



h. NTP budget and funding gap by Stop TB Strategy component (US$ millions)

	2009 BUDGET	GAP
DOTS expansion and enhancement	10	3.8
TB/HIV, MDR-TB and other challenges	0.5	0.3
Health system strengthening	0	0
Engage all care providers	0.1	0.1
People with TB, and communities	0.2	0.2
Research and surveys	0	0
Other	0.05	0.04

SOURCES, METHODS AND ABBREVIATIONS

[a–g] Please see footnotes page 169.

[1] Total TB control costs for 2002–2007 are based on expenditure, whereas those for 2008–2009 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

[2] NTP available funding for 2004–2007 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003 and 2008–2009 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.

– indicates not available or not applicable; pop, population; ss+, sputum smear-positive; ss–, sputum smear-negative pulmonary; unk, pulmonary – sputum smear not done or result unknown.

Nigeria

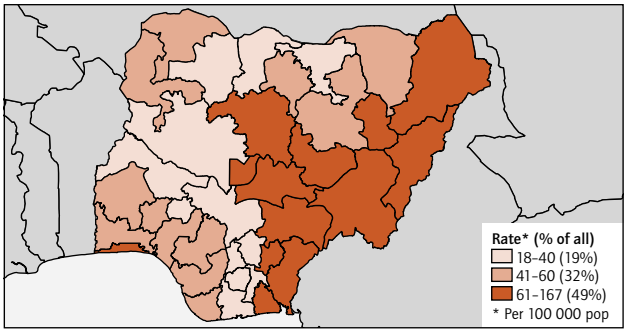
The Stop TB Strategy is being implemented in all 774 local government areas following increased funding from diverse sources including the Global Fund. At least two health facilities in each area have fully functional DOTS services. The case detection rate has been increasing steadily but remains relatively low. However, although the outcome of treatment was not evaluated for a high proportion of patients, the treatment success rate was 76%. Collaborative TB/HIV activities are being scaled up, and 32% of TB cases are screened for HIV at major health facilities. As part of the programmatic management of MDR-TB, two national and six zonal laboratories are being set up. PPM and community-based TB care activities are being expanded. Major challenges include human resource constraints, coordinating multiple partners, setting up a commodity management system and closing remaining funding gaps.

SURVEILLANCE AND EPIDEMIOLOGY

Population (thousands)[a] 148 093

Estimates of epidemiological burden, 2007[b]	ALL	IN HIV+ PEOPLE
Incidence		
All forms of TB (thousands of new cases per year)	460	123
All forms of TB (new cases per 100 000 pop/year)	311	83
Rate of change in incidence rate (%), 2006–2007	**–2.6**	**–2.7**
New ss+ cases (thousands of new cases per year)	195	43
New ss+ cases (per 100 000 pop/year)	131	29
HIV+ incident TB cases (% of all TB cases)	27	–
Prevalence		
All forms of TB (thousands of cases)	772	62
All forms of TB (cases per 100 000 pop)	**521**	42
2015 target for prevalence (cases per 100 000 pop)	**141**	–
Mortality		
All forms of TB (thousands of deaths per year)	138	59
All forms of TB (deaths per 100 000 pop/year)	**93**	40
2015 target for mortality (deaths per 100 000 pop/year)	**18**	–
Multidrug-resistant TB (MDR-TB)		
MDR-TB among all new TB cases (%)	1.8	–
MDR-TB among previously treated TB cases (%)	9.4	–

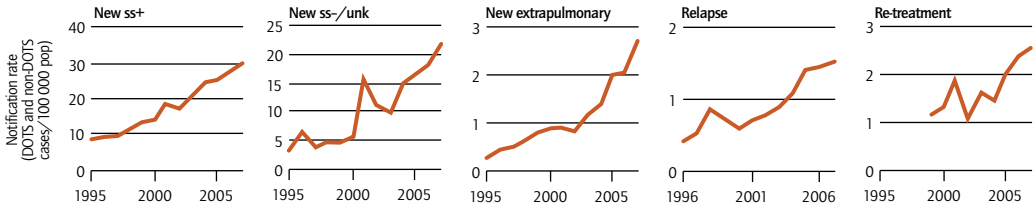
TB notification rate (new and relapse), 2007



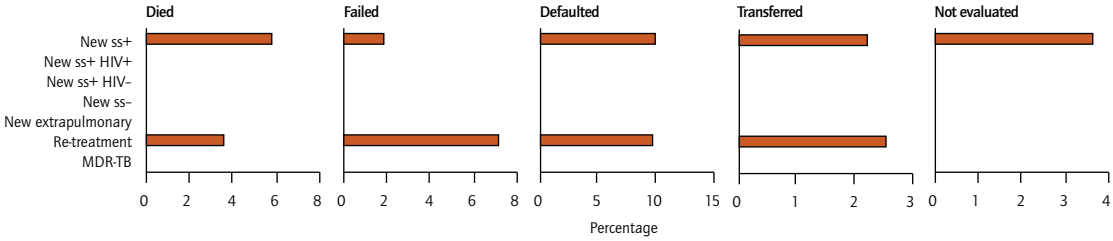
Total notifications, 2007

Notified new and relapse cases (thousands)	82
Notified new and relapse cases (per 100 000 pop/year)	56
Notified new ss+ cases (thousands)	44
Notified new ss+ cases (per 100 000 pop/year)	30
as % of new pulmonary cases	58
sex ratio (male/female)	1.4
DOTS case detection rate (% of estimated new ss+)	**23**
Notified new extrapulmonary cases (thousands)	4.0
as % of notified new cases	5.0
Notified new ss+ cases in children (<15 years) (thousands)	1.2
as % of notified new ss+ cases	2.7

Case notifications



Unfavourable treatment outcomes, 2006 cohorts



	2000	2001	2002	2003	2004	2005	2006	2007
DOTS coverage (%)	47	55	55	60	65	65	75	91
Notification rate (new & relapse cases/100 000 pop)	21	36	29	33	41	44	49	56
% notified new & relapse cases reported under DOTS	100	66	78	100	100	100	100	100
Notification rate (new ss+ cases/100 000 pop)	14	18	17	21	24	25	28	30
% notified new ss+ cases reported under DOTS	100	81	89	100	100	100	100	100
Case detection rate (all new cases, %)	7.4	12	9.1	9.7	12	13	15	17
Case detection rate (new ss+ cases, %)	12	15	13	15	17	18	20	23
Treatment success (new ss+ patients, %)	79	79	79	78	73	75	76	–
Re-treatment success (ss+ patients, %)	71	71	73	–	73	66	77	–

Note: notification, case detection and treatment success rates are for the whole country (i.e. DOTS and non-DOTS cases combined).

DOTS EXPANSION AND ENHANCEMENT

Overview of services for diagnosis of TB and treatment of patients

Description of basic management unit	General hospital
Number of units (DOTS/total), 2007	701/774
Location of NTP services	
Rural Primary health centre	
Urban General hospital	
NTP services part of general primary health-care network?	Yes
Location where TB diagnosed	
Rural Primary and general hospital	
Urban General hospital	
Diagnosis free of charge?	Yes (all suspects)
Treatment supervised?	All patients in all units
Intensive phase	Health-care worker, community member, family member
Continuation phase	Health-care worker, community member, family member
Category I regimen	2(HRZE)/6(HE)
Treatment free of charge	All patients in all units
External review missions	last: 2008
	next: 2009

Political commitment

National strategic plan?	Yes (2006–2010)
Mechanism for national interagency coordination?	Yes (established 2002)
National Stop TB Partnership?	No (planned 2008)

Financial indicators, 2009

(see final page for detailed presentation)	%
Government contribution to NTP budget (incl loans)	16
Government contribution to total cost TB control (incl loans)	33
Government health spending used for TB control	4.6
NTP budget funded	57

Per capita health financial indicators, 2009

	US$
NTP budget per capita	0.3
Total costs for TB control per capita	0.4
Funding gap per capita	0.1
Government health expenditure per capita (2005)	8.4
Total health expenditure per capita (2005)	27

Quality-assured bacteriology

National reference laboratory?	Yes

All TB laboratories performing EQA of smear microscopy or DST under the supervision of the National Reference Laboratory

	Smear				Culture		DST			
	Number	per 100 000	EQA	% adeq perf	Number	per 5 000 000	Number	per 10 000 000	EQA	% adeq perf
2007	794	0.5	347	93%	2	0.1	1	0.1	–	–
2008	1 138	0.8	1 138	–	9	0.3	9	0.6	9.0	–

Note: for routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extra-pulmonary and ss–/HIV+ TB, as well as DST of re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population. EQA column shows number of laboratories for which EQA was done. Adeq perf; adequate performance for microscopy based on results of EQA.

System for managing drug supplies and laboratory equipment

	Central level			Peripheral level		
	2005	2006	2007	2005	2006	2007
Stock-outs of laboratory supplies?	–	No	No	–	–	No
Stock-outs of first-line anti-TB drugs?	No	No	Yes	No	No	Some units

Monitoring and evaluation system, and impact measurement

NTP publishes annual report?	Yes (since 2000)
% of BMUs reporting to next level in 2007	
Case-finding	100%
Treatment outcomes	100%

Burden and impact assessment		last	next
In-depth analysis of routine surveillance data	Yes	2007	2008
Prevalence of disease survey	Yes, national	–	2009
Prevalence of infection survey	No	–	–
Drug resistance survey	–	–	–
Mortality survey	No	–	–
Analysis of vital registration data	No	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES

Multidrug-resistant TB (MDR-TB)

	2005	2006	2007
	Number (% of estimated ss+ MDR-TB)		
Estimated incidence of ss+ MDR cases	6 971	6 957	6 934
Diagnosed and notified	– (–%)	– (–%)	45 (0.65%)
Registered for treatment	– (–%)	– (–%)	– (–%)
GLC	0	0	0
non-GLC	–	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES (*continued*)

Detection and treatment of HIV in TB patients, 2007

TB patients for whom the HIV test result was known	27 849
as % of all notified TB patients	32
TB patients with positive HIV test	6 275
as % of all estimated HIV+ TB cases	5.1
HIV+ TB patients started or continued on CPT	1 953
as % of HIV+ TB patients notified	31
HIV+ TB patients started or continued on ART	–
as % of HIV+ TB patients notified	–

Screening for TB in HIV-positive patients, 2007

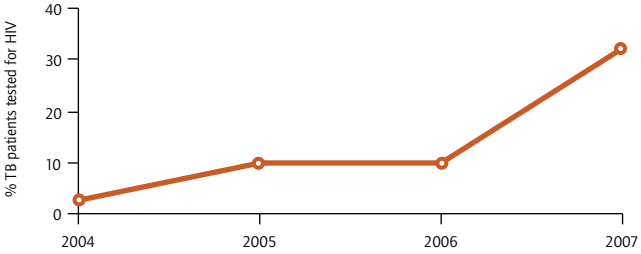
HIV+ patients in HIV care or ART register	233 495
Screened for TB	86 897
as % of HIV+ patients in HIV care or ART register	37
Started on TB treatment	15 418
as % of HIV+ patients in HIV care or ART register	6.6
Started on IPT	76
as % of HIV+ patients without TB in HIV care or ART register	0.03

High-risk groups, 2007

Number of close contacts of ss+ TB patients screened	–
Number of TB cases identified among contacts	–
% of contacts with TB	–
Contacts started on IPT	–
% of contacts without TB on IPT	–

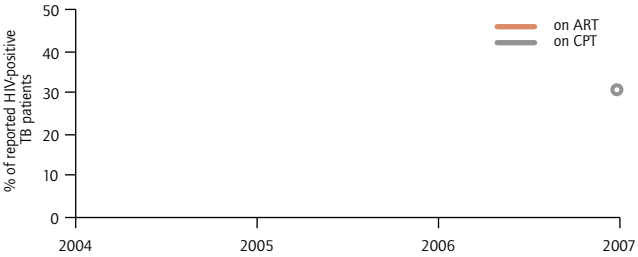
HIV testing for TB patients

The proportion of TB patients screened for HIV tripled between 2006 and 2007



CPT and ART for HIV-positive TB patients

No data were reported on ART; data on the provision of CPT were reported for the first time



CONTRIBUTING TO HEALTH SYSTEM STRENGTHENING

The public health-care system, into which TB control is fully integrated, is constrained by a lack of human resources and difficulties in providing outreach services - particularly in rural areas. A wide range of hospitals and other tertiary institutions that are not yet linked to the NTP are available in urban areas; an unregulated private health sector is a problem throughout the country. Initiatives are ongoing to engage these various providers.

Practical Approach to Lung Health (PAL), 2007

Number of health-care facilities providing PAL services	0	As % of total number of health-care facilities	0

ENGAGING ALL CARE PROVIDERS

Public-public and public-private approaches (PPM), 2007

Number of providers collaborating with the NTP[c]

	Number collaborating (total number of providers)	% total notified TB Diagnosed	Treated
Public sector	– (–)	–	–
Private sector	410 (–)	4.6	4.6

International Standards for Tuberculosis Care (ISTC)

ISTC endorsed by professional organizations?	Yes
By which organizations:	
Nigeria Medical Association	
ISTC included in medical curriculum?	No

EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

Advocacy, communication and social mobilization (ACSM)

A KAP survey was conducted in 2008 to refine the ACSM component of the National TB Control Strategy 2006–2010. An ACSM consultant participated in the 2008 national programme review to assess progress towards ACSM targets and drafted recommendations for future ACSM activities.

Community participation in TB care and Patients' Charter

Community-based services are currently implemented in six pilot states in the country, based on national guidelines which are fully in accordance with global policy. Careful attention is given to ensuring high-quality care and raising awareness about TB. Wide expansion of community-based services is planned by the end of 2009.

ENABLING AND PROMOTING RESEARCH

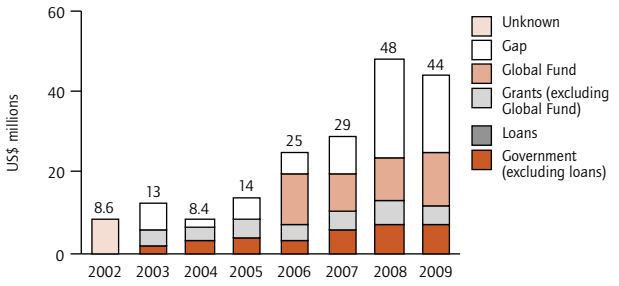
Programme-based operational research, 2007

Operational research budget (% of NTP budget)	1.7%

FINANCING

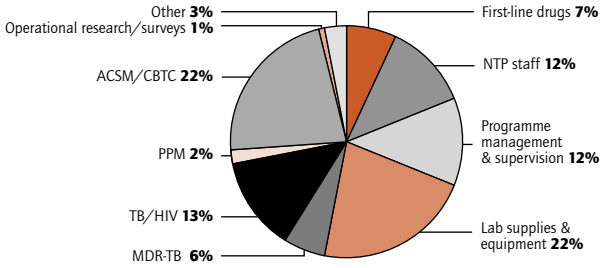
a. NTP budget by source of funding

Increased NTP budget after re-assessment of funding needs; funding has also grown but large funding gaps remain



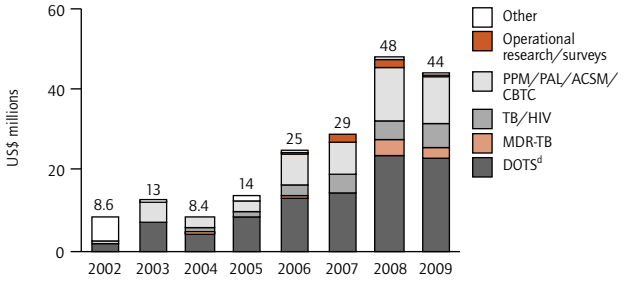
b. NTP budget line items in 2009

Laboratory budget includes introduction of molecular tests at national level; share of budget for ACSM (including community TB care) is large compared with most HBCs



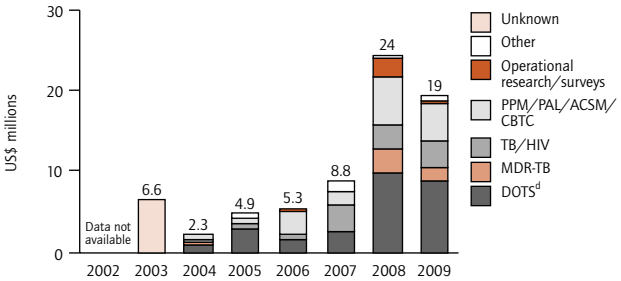
c. NTP budget by line item

Increasing budget for DOTS and ACSM, and to a lesser extent for MDR-TB, with plan to treat 50 MDR-TB patients if approved by GLC



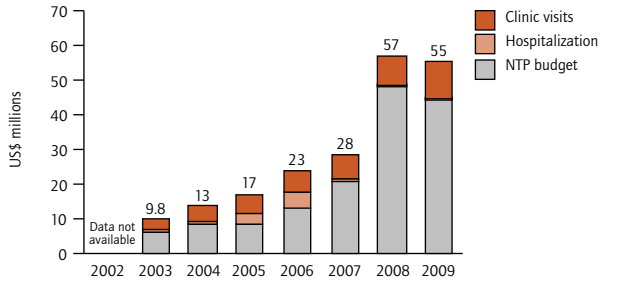
d. NTP funding gap by line item

Funding gap within DOTS mainly for laboratory supplies and equipment



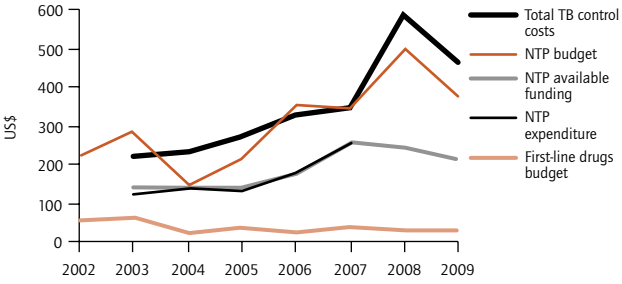
e. Total TB control costs by line item[1]

Hospitalization costs based on estimate that 20–30% of new TB patients were hospitalized for average of 56 days 2005–2006, and 7% of new TB patients hospitalized for 14 days in 2007–2009



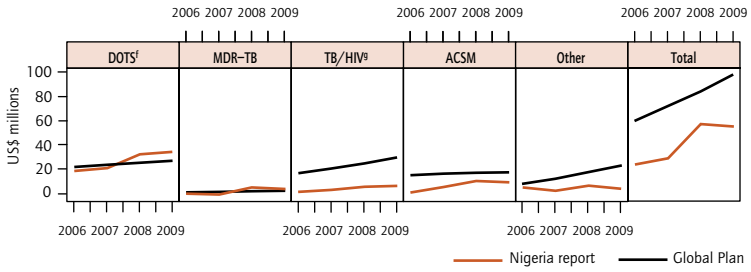
f. Per patient costs, budgets and expenditures[2]

Expenditures have increased in line with available funding, showing good absorption capacity (2003–2007)



g. Global Plan compared with country reports[e]

Country implementation of TB control activities (2006–2007) in line with the Global Plan for DOTS only; country plan (2008–2009) falls short of Global Plan for community TB care and TB/HIV



h. NTP budget and funding gap by Stop TB Strategy component (US$ millions)

	2009 BUDGET	GAP
DOTS expansion and enhancement	23	8.7
TB/HIV, MDR-TB and other challenges	8.7	5.2
Health system strengthening	0.7	0.3
Engage all care providers	1.0	0.5
People with TB, and communities	9.9	3.8
Research and surveys	0.4	0.3
Other	0.7	0.5

SOURCES, METHODS AND ABBREVIATIONS

[a–g] Please see footnotes page 169.

[1] Total TB control costs for 2003–2007 are based on expenditure, whereas those for 2008–2009 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

[2] NTP available funding for 2004–2007 is based on the amount of funding actually received, using retrospective data; available funding for 2003 and 2008–2009 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.

– indicates not available or not applicable; pop, population; ss+, sputum smear-positive; ss–, sputum smear-negative pulmonary; unk, pulmonary – sputum smear not done or result unknown.

Pakistan

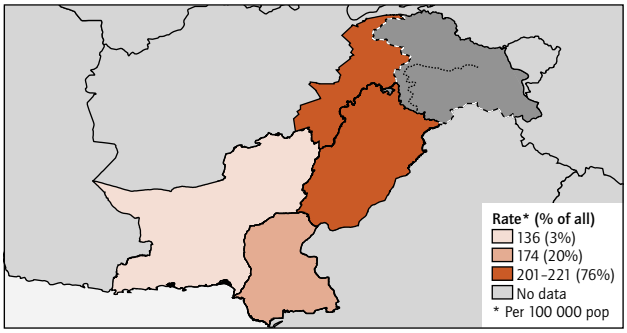
The case detection rate is increasing and is just below target at 67%, while the treatment success rate has reached 88%. PPM initiatives account for an increasing share of notifications, notably from tertiary hospitals and a social franchising project involving private clinics that is implemented by an NGO in five cities. A new recording and reporting system introduced in 2008 will allow precise quantification of the contribution of PPM to total notifications. An EQA system has been implemented and is being expanded to cover the entire TB microscopy network. However, the network of services for culture and DST is inadequate. MDR-TB case management has been initiated, and collaborative TB/HIV activities have not yet been scaled up. A much needed TB prevalence survey is planned in 2009. ACSM activities have been expanded, although the national Stop TB Partnership launched in 2004 is not yet fully functional.

SURVEILLANCE AND EPIDEMIOLOGY

Population (thousands)[a] 163 902

Estimates of epidemiological burden, 2007[b]	ALL	IN HIV+ PEOPLE
Incidence		
All forms of TB (thousands of new cases per year)	297	6.2
All forms of TB (new cases per 100 000 pop/year)	181	3.8
Rate of change in incidence rate (%), 2006–2007	**0**	**6.2**
New ss+ cases (thousands of new cases per year)	133	2.2
New ss+ cases (per 100 000 pop/year)	81	1.3
HIV+ incident TB cases (% of all TB cases)	2.1	–
Prevalence		
All forms of TB (thousands of cases)	365	3.1
All forms of TB (cases per 100 000 pop)	**223**	1.9
2015 target for prevalence (cases per 100 000 pop)	**215**	–
Mortality		
All forms of TB (thousands of deaths per year)	48	1.4
All forms of TB (deaths per 100 000 pop/year)	**29**	0.9
2015 target for mortality (deaths per 100 000 pop/year)	**25**	–
Multidrug-resistant TB (MDR-TB)		
MDR-TB among all new TB cases (%)	3.2	–
MDR-TB among previously treated TB cases (%)	35	–

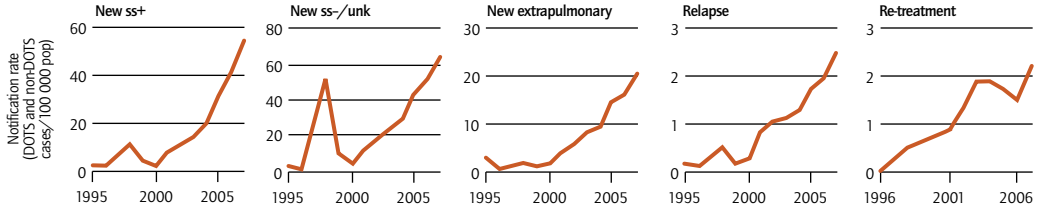
TB notification rate (new and relapse), 2007



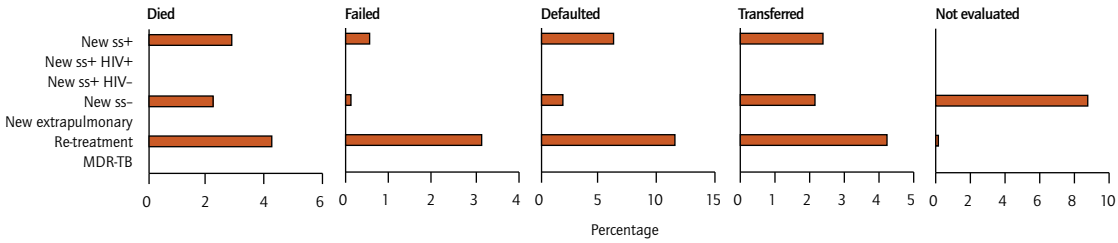
Total notifications, 2007

Notified new and relapse cases (thousands)	230
Notified new and relapse cases (per 100 000 pop/year)	141
Notified new ss+ cases (thousands)	89
Notified new ss+ cases (per 100 000 pop/year)	54
as % of new pulmonary cases	46
sex ratio (male/female)	1.1
DOTS case detection rate (% of estimated new ss+)	**67**
Notified new extrapulmonary cases (thousands)	34
as % of notified new cases	15
Notified new ss+ cases in children (<15 years) (thousands)	3.5
as % of notified new ss+ cases	3.9

Case notifications



Unfavourable treatment outcomes, 2006 cohorts



	2000	2001	2002	2003	2004	2005	2006	2007
DOTS coverage (%)	9.0	24	44	66	79	100	100	99
Notification rate (new & relapse cases/100 000 pop)	7.7	23	35	46	61	90	110	141
% notified new & relapse cases reported under DOTS	100	53	90	100	100	100	100	100
Notification rate (new ss+ cases/100 000 pop)	2.3	7.4	11	14	20	31	41	54
% notified new ss+ cases reported under DOTS	100	57	94	100	100	100	100	100
Case detection rate (all new cases, %)	4.1	12	19	25	33	49	59	76
Case detection rate (new ss+ cases, %)	2.8	9.1	13	17	25	38	50	67
Treatment success (new ss+ patients, %)	74	77	78	79	82	83	88	–
Re-treatment success (ss+ patients, %)	54	–	66	66	78	76	77	–

Note: notification, case detection and treatment success rates are for the whole country (i.e. DOTS and non-DOTS cases combined).

DOTS EXPANSION AND ENHANCEMENT

Overview of services for diagnosis of TB and treatment of patients

Description of basic management unit	Diagnostic centre
Number of units (DOTS/total), 2007	1130/1130
Location of NTP services	
Rural	District hospital, subdistrict hospital, TB clinic
Urban	Tertiary care, teaching hospital, district hospital
NTP services part of general primary health-care network?	Yes
Location where TB diagnosed	
Rural	All except basic health units, dispensaries
Urban	All except basic health units, dispensaries
Diagnosis free of charge?	Yes (all suspects)
Treatment supervised?	All patients in all units
Intensive phase	Health-care worker, community member, family member
Continuation phase	Family member
Category I regimen	2HRZE/6HE
Treatment free of charge	All patients in all units
External review missions	last: 2008
	next: 2009

Political commitment

National strategic plan?	Yes, (2005–2010)
Mechanism for national interagency coordination?	Yes (established 2001)
National Stop TB Partnership?	Yes (established 2004)

Financial indicators, 2009

(see final page for detailed presentation)	%
Government contribution to NTP budget (incl loans)	19
Government contribution to total cost TB control (incl loans)	24
Government health spending used for TB control	14
NTP budget funded	53

Per capita health financial indicators, 2009

	US$
NTP budget per capita	0.3
Total costs for TB control per capita	0.3
Funding gap per capita	0.1
Government health expenditure per capita (2005)	2.5
Total health expenditure per capita (2005)	15

Quality-assured bacteriology

National reference laboratory?	No (planned for 2008)

All TB laboratories performing EQA of smear microscopy or DST under the supervision of the National Reference Laboratory

	Smear				Culture		DST			
	Number	per 100 000	EQA	% adeq perf	Number	per 5 000 000	Number	per 10 000 000	EQA	% adeq perf
2007	1 131	0.7	360	44%	3	0.1	1	0.1	0	–
2008	1 131	0.7	906	–	5	0.1	1	0.1	0	–

Note: for routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extra-pulmonary and ss–/HIV+ TB, as well as DST of re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population. EQA column shows number of laboratories for which EQA was done. Adeq perf; adequate performance for microscopy based on results of EQA.

System for managing drug supplies and laboratory equipment

	Central level			Peripheral level		
	2005	2006	2007	2005	2006	2007
Stock-outs of laboratory supplies?	–	No	No	–	Some units	Some units
Stock-outs of first-line anti-TB drugs?	No	No	No	No	No	No

Monitoring and evaluation system, and impact measurement

NTP publishes annual report?	Yes (since 2001)
% of BMUs reporting to next level in 2007	
Case-finding	–
Treatment outcomes	–

Burden and impact assessment		last	next
In-depth analysis of routine surveillance data	No	–	–
Prevalence of disease survey	Yes, national	1987	2009
Prevalence of infection survey	Yes, national	1987	2009
Drug resistance survey	–	–	–
Mortality survey	Yes	2006	–
Analysis of vital registration data	Yes	2008	–

MDR-TB, TB/HIV AND OTHER CHALLENGES

Multidrug-resistant TB (MDR-TB)	2005	2006	2007
	Number (% of estimated ss+ MDR-TB)		
Estimated incidence of ss+ MDR cases	7 659	7 796	7 939
Diagnosed and notified	– (–%)	– (–%)	– (–%)
Registered for treatment	– (–%)	– (–%)	– (–%)
GLC	0	0	0
non-GLC	–	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES (*continued*)

Detection and treatment of HIV in TB patients, 2007

TB patients for whom the HIV test result was known	–
as % of all notified TB patients	–
TB patients with positive HIV test	–
as % of all estimated HIV+ TB cases	–
HIV+ TB patients started or continued on CPT	–
as % of HIV+ TB patients notified	–
HIV+ TB patients started or continued on ART	–
as % of HIV+ TB patients notified	–

Screening for TB in HIV-positive patients, 2007

HIV+ patients in HIV care or ART register	–
Screened for TB	–
as % of HIV+ patients in HIV care or ART register	–
Started on TB treatment	–
as % of HIV+ patients in HIV care or ART register	–
Started on IPT	–
as % of HIV+ patients without TB in HIV care or ART register	–

High-risk groups, 2007

Number of close contacts of ss+ TB patients screened	–
Number of TB cases identified among contacts	–
% of contacts with TB	–
Contacts started on IPT	–
% of contacts without TB on IPT	–

HIV testing for TB patients

Data not reported

CPT and ART for HIV-positive TB patients

Data not reported

CONTRIBUTING TO HEALTH SYSTEM STRENGTHENING

TB services are fully integrated into the public health care system. Human resource constraints and difficulties in providing outreach services, particularly in rural areas and conflict zones, affect services to control TB. In urban areas many hospitals and other tertiary institutions are not yet fully linked to the NTP, and an unregulated private health sector is a problem throughout the country. The NTP has collaborated with other public health programmes to improve the capacity of laboratories, human resources and supervision and monitoring. Innovative approaches for engaging hospitals, NGOs and the private sector are being scaled up.

Practical Approach to Lung Health (PAL), 2007

Number of health-care facilities providing PAL services	0	As % of total number of health-care facilities	0

ENGAGING ALL CARE PROVIDERS

Public-public and public-private approaches (PPM), 2007

Number of providers collaborating with the NTP[c]

	Number collaborating (total number of providers)	% total notified TB Diagnosed	Treated
Public sector	19 (–)	0.5	0.5
Private sector	5 005 (100 030)	19	19

International Standards for Tuberculosis Care (ISTC)

ISTC endorsed by professional organizations?	No
ISTC included in medical curriculum?	No

EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

Advocacy, communication and social mobilization (ACSM)

ACSM activities continue to be prioritized. The revised National ACSM Strategy is in place, and a National Steering Committee on ACSM is operational. There is strong collaboration with the private sector for use of mass media and with NGOs for social mobilization. National guidelines on monitoring and evaluation in the private sector are available. Major challenges for the NTP are ensuring continued commitment to ACSM at all levels of the NTP, developing strong evidence of Scam's contribution to increasing rates of case detection and treatment success, and implementing Global Fund-related workplan in a timely manner.

Community participation in TB care and Patients' Charter

There are >100 000 lady health workers working in the public sector who assist national preventive and curative programmes, including the NTP. In parts of the country, religious leaders have been actively engaged in raising awareness of TB. Patients are included in the country coordination mechanism. The Patients' Charter has been translated into local languages and widely distributed to health facilities. Coalitions of community-based organizations are being established in 57 districts. A pilot initiative to promote TB messages in schools has also been initiated.

ENABLING AND PROMOTING RESEARCH

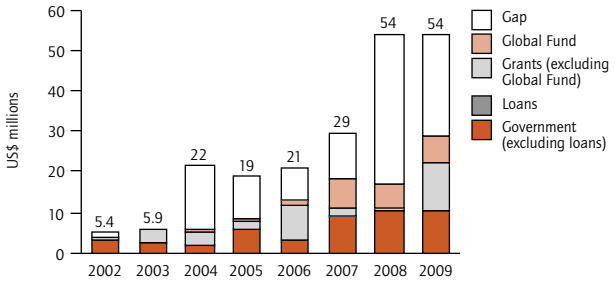
Programme-based operational research, 2007

Operational research budget (% of NTP budget)	0.7%

FINANCING

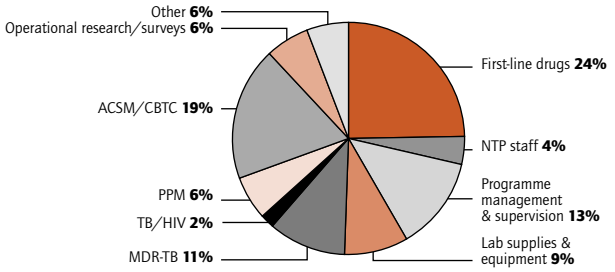
a. NTP budget by source of funding

NTP budget 10 times higher in 2009; funding increased due to increased donor financing; funding gap will be reduced if US$ 25 million Global Fund round 8 application is successful



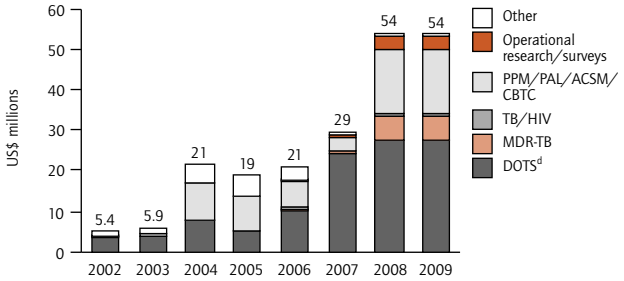
b. NTP budget line items in 2009

Most of the budget is for DOTS (51%) and PPM/PAL/CBTC/ACSM (29%)



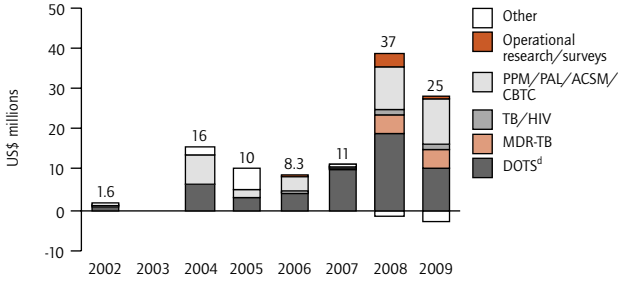
c. NTP budget by line item

Major growth in DOTS budget since 2002; from 2008 big increases in budgets for PPM (with over 1000 private providers engaged), ACSM, MDR-TB; most of the budget within operational research is for a disease prevalence survey



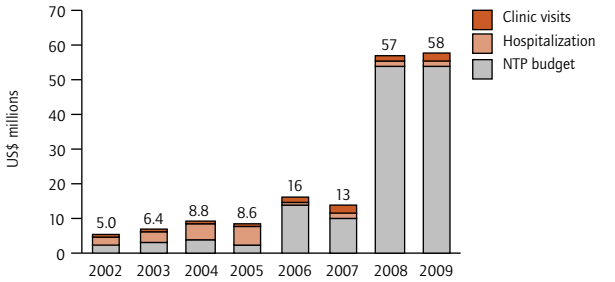
d. NTP funding gap by line item

Increased funding gap in 2008; MDR-TB gap to be financed through public sector funds and other donors; large ACSM gap to be filled with funding from round 6 Global Fund grant



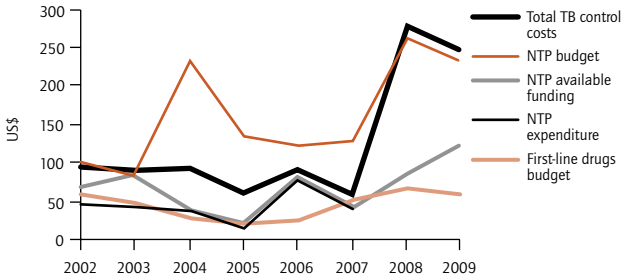
e. Total TB control costs by line item[1]

Almost all costs for TB control will be included in the NTP budget after 2008 if funds are mobilized and spent; lower use of hospitalization as DOTS expands



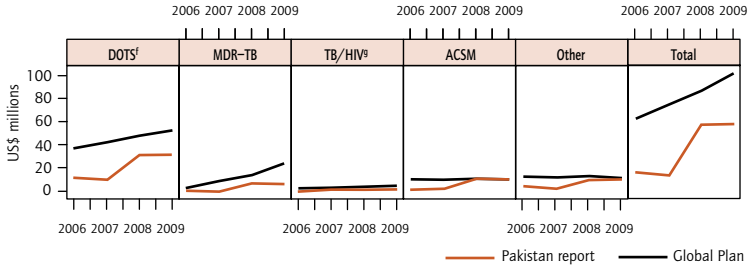
f. Per patient costs, budgets and expenditures[2]

Costs and budget per patient increasing as new elements of Stop TB Strategy are introduced; first-line drugs budget highest in 2009 due to purchase of buffer stock



g. Global Plan compared with country reports[e]

Country assessment of funding requirements lower than Global Plan estimates, except for TB/HIV, ACSM and Other



h. NTP budget and funding gap by Stop TB Strategy component (US$ millions)

	2009 BUDGET	GAP
DOTS expansion and enhancement	27	10
TB/HIV, MDR-TB and other challenges	7.1	5.7
Health system strengthening	2.5	2.5
Engage all care providers	3.0	1.2
People with TB, and communities	10	7.8
Research and surveys	3.2	0.8
Other	0.7	-3.0

SOURCES, METHODS AND ABBREVIATIONS

[a–g] Please see footnotes page 169.

[1] Total TB control costs for 2002–2007 are based on expenditure, whereas those for 2008–2009 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

[2] NTP available funding for 2004–2007 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003 and 2008–2009 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.

– indicates not available or not applicable; pop, population; ss+, sputum smear-positive; ss–, sputum smear-negative pulmonary; unk, pulmonary – sputum smear not done or result unknown.

Philippines

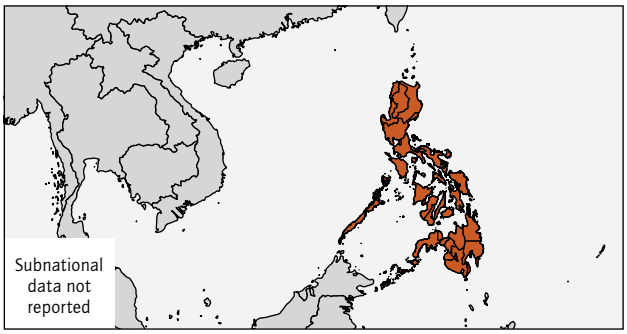
Case detection and treatment success rates have exceeded the global targets since 2004. PPM initiatives have been further expanded, and their contribution to the national case detection rate reached 9% in 2007, with only 40% population coverage. The country is now scaling up programmatic management of drug-resistant TB to include areas beyond Metro Manila, expanding services for TB in children and addressing TB in high-risk groups including among the HIV-infected, the urban poor and the prison population. The third prevalence survey in 2007 showed a 34% decrease in bacteriologically-confirmed TB compared with the 1997 survey. The survey results will help re-estimate the burden of TB in the Philippines and improve understanding of risk factors. Government commitment is strong, and the increases in funding from domestic sources and the Global Fund grant have helped to reduce funding gaps.

SURVEILLANCE AND EPIDEMIOLOGY

Population (thousands)[a] 87 960

Estimates of epidemiological burden, 2007[b]	ALL	IN HIV+ PEOPLE
Incidence		
All forms of TB (thousands of new cases per year)	255	0.9
All forms of TB (new cases per 100 000 pop/year)	290	1.0
Rate of change in incidence rate (%), 2006–2007	**–1.8**	**2.4**
New ss+ cases (thousands of new cases per year)	115	0.3
New ss+ cases (per 100 000 pop/year)	130	0.3
HIV+ incident TB cases (% of all TB cases)	0.3	–
Prevalence		
All forms of TB (thousands of cases)	440	0.4
All forms of TB (cases per 100 000 pop)	**500**	0.5
2015 target for prevalence (cases per 100 000 pop)	**400**	–
Mortality		
All forms of TB (thousands of deaths per year)	36	0.3
All forms of TB (deaths per 100 000 pop/year)	**41**	0.3
2015 target for mortality (deaths per 100 000 pop/year)	**44**	–
Multidrug-resistant TB (MDR-TB)		
MDR-TB among all new TB cases (%)	4.0	–
MDR-TB among previously treated TB cases (%)	21	–

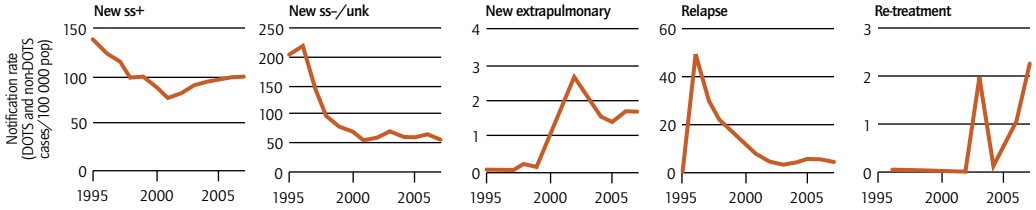
TB notification rate (new and relapse), 2007



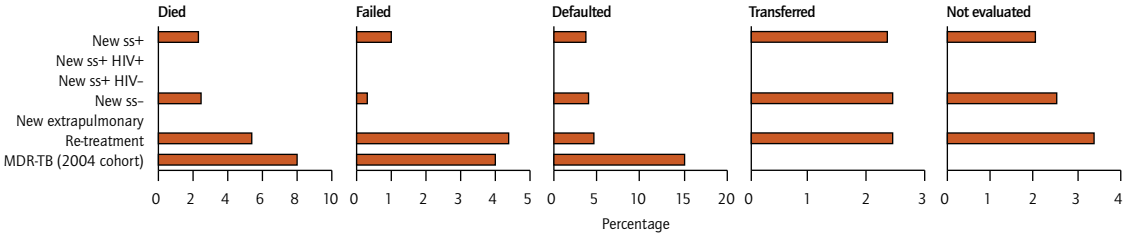
Total notifications, 2007

Notified new and relapse cases (thousands)	141
Notified new and relapse cases (per 100 000 pop/year)	160
Notified new ss+ cases (thousands)	87
Notified new ss+ cases (per 100 000 pop/year)	98
as % of new pulmonary cases	64
sex ratio (male/female)	2.4
DOTS case detection rate (% of estimated new ss+)	**75**
Notified new extrapulmonary cases (thousands)	1.5
as % of notified new cases	1.1
Notified new ss+ cases in children (<15 years) (thousands)	0.8
as % of notified new ss+ cases	1.0

Case notifications



Unfavourable treatment outcomes, 2006 cohorts



	2000	2001	2002	2003	2004	2005	2006	2007
DOTS coverage (%)	90	95	98	100	100	100	100	100
Notification rate (new & relapse cases/100 000 pop)	157	138	149	164	158	162	171	160
% notified new & relapse cases reported under DOTS	75	100	100	100	100	100	100	100
Notification rate (new ss+ cases/100 000 pop)	88	76	82	90	94	97	99	98
% notified new ss+ cases reported under DOTS	75	100	100	100	100	100	100	100
Case detection rate (all new cases, %)	48	40	46	52	50	52	56	54
Case detection rate (new ss+ cases, %)	59	52	57	64	69	71	75	75
Treatment success (new ss+ patients, %)	88	88	88	88	87	89	88	–
Re-treatment success (ss+ patients, %)	–	–	–	76	53	–	80	–

Note: notification, case detection and treatment success rates are for the whole country (i.e. DOTS and non-DOTS cases combined).

DOTS EXPANSION AND ENHANCEMENT

Overview of services for diagnosis of TB and treatment of patients

Description of basic management unit	Health centre
Number of units (DOTS/total), 2007	3075/3075
Location of NTP services	
Rural Rural health unit	
Urban Health centre	
NTP services part of general primary health-care network?	Yes
Location where TB diagnosed	
Rural Rural health unit	
Urban Health centre	
Diagnosis free of charge?	Yes (all suspects)
Treatment supervised?	All patients in all units
Intensive phase	Health-care worker, community member, family member
Continuation phase	Health-care worker, community member, family member
Category I regimen	2HRZE/4HR
Treatment free of charge	All patients in all units
External review missions	last: 2008 next: –

Political commitment

National strategic plan?	Yes (2006–2010)
Mechanism for national interagency coordination?	Yes (established 2003)
National Stop TB Partnership?	Yes (established 1994)

Financial indicators, 2009

(see final page for detailed presentation)	%
Government contribution to NTP budget (incl loans)	35
Government contribution to total cost TB control (incl loans)	56
Government health spending used for TB control	2.9
NTP budget funded	81

Per capita health financial indicators, 2009

	US$
NTP budget per capita	0.2
Total costs for TB control per capita	0.4
Funding gap per capita	0.05
Government health expenditure per capita (2005)	14
Total health expenditure per capita (2005)	37

Quality-assured bacteriology

National reference laboratory?	Yes

All TB laboratories performing EQA of smear microscopy or DST under the supervision of the National Reference Laboratory

	Smear				Culture		DST			
	Number	per 100 000	EQA	% adeq perf	Number	per 5 000 000	Number	per 10 000 000	EQA	% adeq perf
2007	2 374	2.7	2 374	–	3	0.2	3	0.3	3.0	–
2008	2 374	2.6	2 374	–	3	0.2	3	0.3	3.0	–

Note: for routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extra-pulmonary and ss–/HIV+ TB, as well as DST of re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population. EQA column shows number of laboratories for which EQA was done. Adeq perf; adequate performance for microscopy based on results of EQA.

System for managing drug supplies and laboratory equipment

	Central level			Peripheral level		
	2005	2006	2007	2005	2006	2007
Stock-outs of laboratory supplies?	–	No	No	–	No	No
Stock-outs of first-line anti-TB drugs?	No	No	Yes	No	No	Some units

Monitoring and evaluation system, and impact measurement

NTP publishes annual report?	Yes (since 2001)
% of BMUs reporting to next level in 2007	
Case-finding	–
Treatment outcomes	–

Burden and impact assessment		last	next
In-depth analysis of routine surveillance data	Yes	–	2008
Prevalence of disease survey	Yes, national	2007	2017
Prevalence of infection survey	Yes, national	2007	2017
Drug resistance survey	Yes, national	2004	–
Mortality survey	No	–	–
Analysis of vital registration data	No	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES

Multidrug-resistant TB (MDR-TB)

	2005	2006	2007
	Number (% of estimated ss+ MDR-TB)		
Estimated incidence of ss+ MDR cases	6 430	6 442	6 451
Diagnosed and notified	274 (4.3%)	403 (6.3%)	568 (8.8%)
Registered for treatment	191 (3.0%)	133 (2.1%)	313 (4.9%)
GLC	191	133	313
non-GLC	–	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES (*continued*)

Detection and treatment of HIV in TB patients, 2007

TB patients for whom the HIV test result was known	46
as % of all notified TB patients	0.03
TB patients with positive HIV test	0
as % of all estimated HIV+ TB cases	–
HIV+ TB patients started or continued on CPT	–
as % of HIV+ TB patients notified	–
HIV+ TB patients started or continued on ART	–
as % of HIV+ TB patients notified	–

Screening for TB in HIV-positive patients, 2007

HIV+ patients in HIV care or ART register	3 150
Screened for TB	–
as % of HIV+ patients in HIV care or ART register	–
Started on TB treatment	–
as % of HIV+ patients in HIV care or ART register	–
Started on IPT	–
as % of HIV+ patients without TB in HIV care or ART register	–

High-risk groups, 2007

Number of close contacts of ss+ TB patients screened	–
Number of TB cases identified among contacts	–
% of contacts with TB	–
Contacts started on IPT	–
% of contacts without TB on IPT	–

HIV testing for TB patients

CPT and ART for HIV-positive TB patients

Data not reported

CONTRIBUTING TO HEALTH SYSTEM STRENGTHENING

The NTP has been actively engaged in improving primary health care and community outreach for better delivery of integrated TB services, including laboratory services and delivery of treatment. Successful engagement of the private sector is being scaled up nationwide, partially through the social insurance system.

Practical Approach to Lung Health (PAL), 2007

Number of health-care facilities providing PAL services	–	As % of total number of health-care facilities	–

ENGAGING ALL CARE PROVIDERS

Public-public and public-private approaches (PPM), 2007

Number of providers collaborating with the NTP[c]

	Number collaborating (total number of providers)	% total notified TB Diagnosed	Treated
Public sector	4 (–)	–	–
Private sector	5 237 (10 000)	8.6	–

International Standards for Tuberculosis Care (ISTC)

ISTC endorsed by professional organizations?	No
ISTC included in medical curriculum?	No

EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

Advocacy, communication and social mobilization (ACSM)

An ACSM review mission was followed by the development of a national ACSM strategy. A KAP survey conducted in 2007 included a mapping exercise which was used to identify the ACSM activities in which different partners were involved. An ACSM Working Group comprising the government, NGOs and private partners has been formed to facilitate coordination in implementing strategic activities. There are 270 patient-centered organizations or networks involved in activities to advocate TB control and implement DOTS.

Community participation in TB care and Patients' Charter

In rural health facilities where NGO support is not available, community health workers assist staff in 95% of public health facilities, visiting the homes of patients who are supported mostly by family members to ensure adequate treatment progress. Community-based support for the continuation phase of MDR-TB treatment has been available since 2006 through a joint effort between public and private services and the community. No data on use of the Patients' Charter were reported in 2008.

ENABLING AND PROMOTING RESEARCH

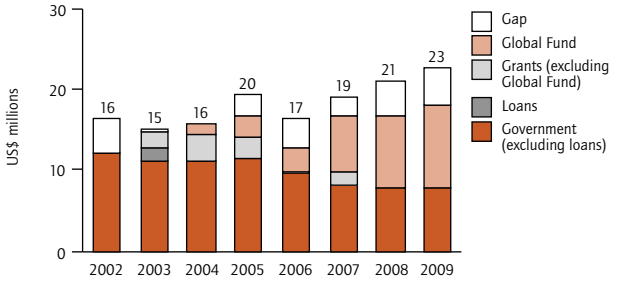
Programme-based operational research, 2007

Operational research budget (% of NTP budget)	4.4%

FINANCING

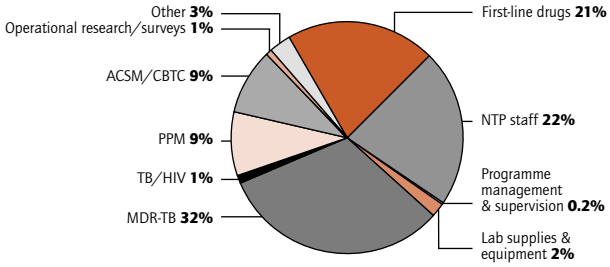
a. NTP budget by source of funding

Increased funding from the Global Fund; funding gaps remain but likely to be partially filled by the government in 2009



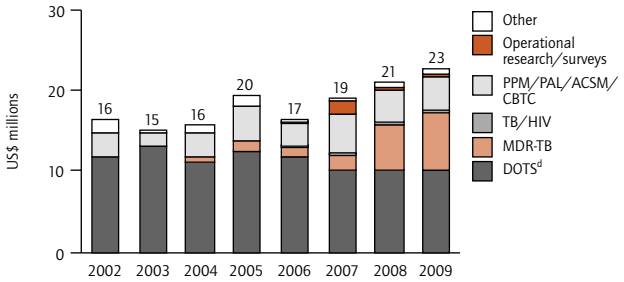
b. NTP budget line items in 2009

Largest component of budget is DOTS (45%) but share for MDR-TB (32%) is also large, especially compared with other HBCs



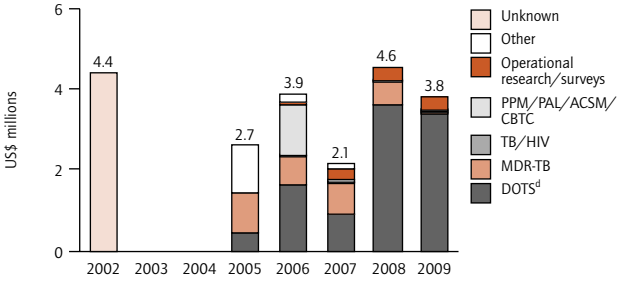
c. NTP budget by line item

Major increase in budget for management of patients with MDR-TB, with plan to treat 1000 patients in 2009



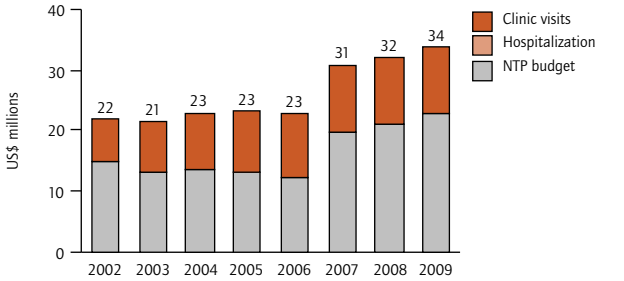
d. NTP funding gap by line item

Funding gap within DOTS mainly for dedicated NTP staff; operational research underfunded since 2007



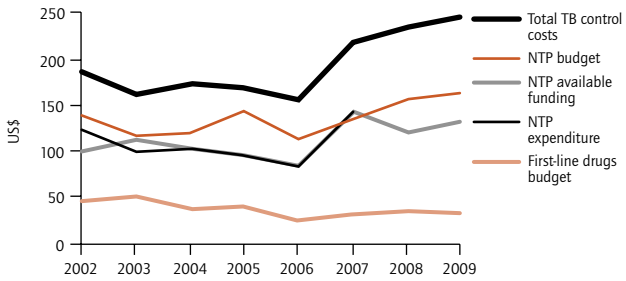
e. Total TB control costs by line item[1]

Cost of clinic visits during treatment based on 120 visits per new ss+ patient and 24 visits per new ss-/extrapulmonary patient during treatment



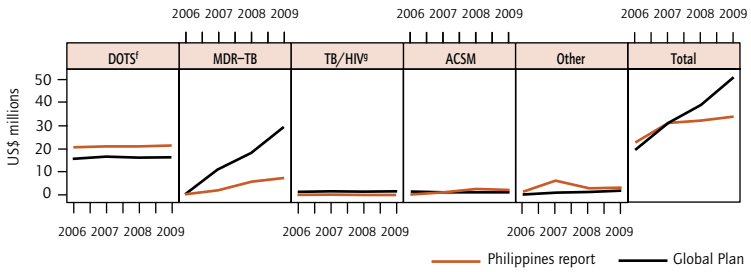
f. Per patient costs, budgets and expenditures[2]

Increased cost, budget and expenditure per patient since 2006, reflecting strengthening of TB control including expansion of MDR-TB treatment



g. Global Plan compared with country reports[e]

Country assessment of funding requirements in line with or higher than Global Plan, except for MDR-TB; despite expansion of MDR-TB treatment, numbers treated are below the targets of the Global MDR/XDR-TB Response Plan



h. NTP budget and funding gap by Stop TB Strategy component (US$ millions)

	2009 BUDGET	GAP
DOTS expansion and enhancement	10	3.4
TB/HIV, MDR-TB and other challenges	7.3	0.04
Health system strengthening	0	0
Engage all care providers	2.1	0.01
People with TB, and communities	2.1	0.02
Research and surveys	0.3	0.3
Other	0.6	0

SOURCES, METHODS AND ABBREVIATIONS

[a–g] Please see footnotes page 169.

[1] Total TB control costs for 2002–2007 are based on expenditure, whereas those for 2008–2009 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

[2] NTP available funding for 2004–2007 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003 and 2008–2009 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.

– indicates not available or not applicable; pop, population; ss+, sputum smear-positive; ss–, sputum smear-negative pulmonary; unk, pulmonary – sputum smear not done or result unknown.

Russian Federation

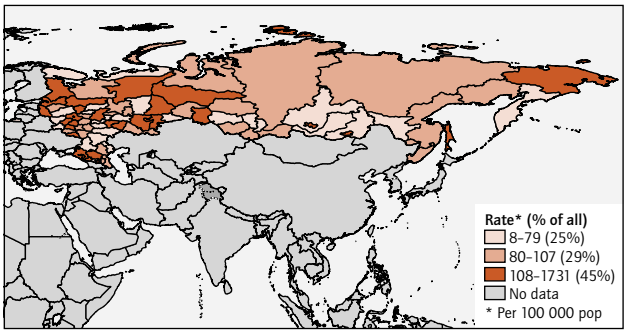
The revised national TB control strategy has been expanded to all regions and a considerable number of penitentiary TB services, with particular attention to improving diagnosis and treatment of MDR-TB. Four regions are implementing MDR-TB projects approved by the GLC; an additional 19 regions have either submitted applications to the GLC or are preparing applications. A federal centre for monitoring TB control has been established to improve the quality of surveillance as well as to conduct operational research and provide technical support to regions. TB projects financed through a World Bank loan have received upgraded laboratory equipment and an improved supply of consumables. The first phase of a Global Fund grant has been successfully implemented, and continued funding has been approved. Major challenges include high rates of MDR-TB among new and previously treated cases combined with an inadequate supply of second-line drugs, poor infection control in TB units and laboratories, and a shortage of appropriately qualified staff. The treatment success rate remains low at 58%, while the case detection rate for new smear-positive cases is 49%.

SURVEILLANCE AND EPIDEMIOLOGY

Population (thousands)[a] 142 499

Estimates of epidemiological burden, 2007[b]	ALL	IN HIV+ PEOPLE
Incidence		
All forms of TB (thousands of new cases per year)	157	26
All forms of TB (new cases per 100 000 pop/year)	110	18
Rate of change in incidence rate (%), 2006–2007	**2.1**	**3.4**
New ss+ cases (thousands of new cases per year)	68	9.0
New ss+ cases (per 100 000 pop/year)	48	6.3
HIV+ incident TB cases (% of all TB cases)	16	–
Prevalence		
All forms of TB (thousands of cases)	164	13
All forms of TB (cases per 100 000 pop)	115	9.0
2015 target for prevalence (cases per 100 000 pop)	**34**	–
Mortality		
All forms of TB (thousands of deaths per year)	25	5.1
All forms of TB (deaths per 100 000 pop/year)	**18**	3.6
2015 target for mortality (deaths per 100 000 pop/year)	**3.7**	–
Multidrug-resistant TB (MDR-TB)		
MDR-TB among all new TB cases (%)	13	–
MDR-TB among previously treated TB cases (%)	49	–

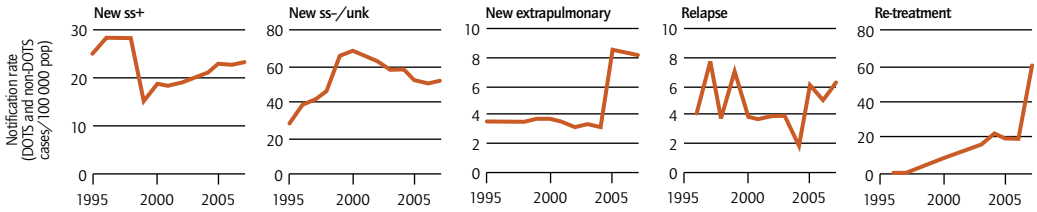
TB notification rate (new and relapse), 2007



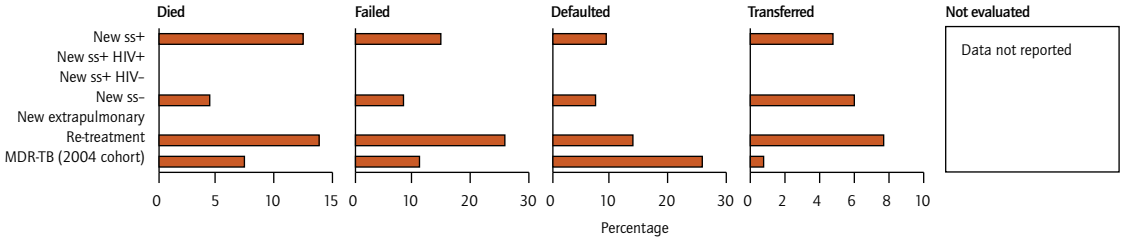
Total notifications, 2007

Notified new and relapse cases (thousands)	127
Notified new and relapse cases (per 100 000 pop/year)	89
Notified new ss+ cases (thousands)	33
Notified new ss+ cases (per 100 000 pop/year)	23
as % of new pulmonary cases	31
sex ratio (male/female)	2.9
DOTS case detection rate (% of estimated new ss+)	**49**
Notified new extrapulmonary cases (thousands)	12
as % of notified new cases	9.9
Notified new ss+ cases in children (<15 years) (thousands)	0.1
as % of notified new ss+ cases	0.2

Case notifications



Unfavourable treatment outcomes, 2006 cohorts



	2000	2001	2002	2003	2004	2005	2006	2007
DOTS coverage (%)	12	16	25	25	45	83	84	100
Notification rate (new & relapse cases/100 000 pop)	95	90	88	85	84	89	87	89
% notified new & relapse cases reported under DOTS	8.3	11	14	14	25	54	76	100
Notification rate (new ss+ cases/100 000 pop)	19	18	19	20	21	23	23	23
% notified new ss+ cases reported under DOTS	13	15	19	22	32	70	93	100
Case detection rate (all new cases, %)	81	78	78	78	78	78	76	75
Case detection rate (new ss+ cases, %)	37	37	40	43	47	49	48	49
Treatment success (new ss+ patients, %)	68	67	67	61	60	58	58	–
Re-treatment success (ss+ patients, %)	49	48	46	45	39	37	38	–

Note: notification, case detection and treatment success rates are for the whole country (i.e. DOTS and non-DOTS cases combined).

DOTS EXPANSION AND ENHANCEMENT

Overview of services for diagnosis of TB and treatment of patients

Description of basic management unit	Central city hospital
Number of units (DOTS/total), 2007	354/354
Location of NTP services	
Rural Dispensary	
Urban Dispensary	
NTP services part of general primary health-care network?	No
Location where TB diagnosed	
Rural Central rayon hospital	
Urban Central city hospital	
Diagnosis free of charge?	Yes (all suspects)
Treatment supervised?	Yes
Intensive phase	Health-care worker, community member
Continuation phase	Health-care worker, community member
Category I regimen	2HRZE/4HR5
Treatment free of charge	All patients in all units
External review missions	last: 2006
	next: –

Political commitment

National strategic plan?	Yes (2007–2011)
Mechanism for national interagency coordination?	Yes (established 2002)
National Stop TB Partnership?	No (planned –)

Financial indicators, 2009

(see final page for detailed presentation)	%
Government contribution to NTP budget (incl loans)	81
Government contribution to total cost TB control (incl loans)	82
Government health spending used for TB control	5.2
NTP budget funded	82

Per capita health financial indicators, 2009

	US$
NTP budget per capita	8.9
Total costs for TB control per capita	9.0
Funding gap per capita	1.6
Government health expenditure per capita (2005)	171
Total health expenditure per capita (2005)	277

Quality-assured bacteriology

National reference laboratory?	Yes

All TB laboratories performing EQA of smear microscopy or DST under the supervision of the National Reference Laboratory

	Smear				Culture		DST			
	Number	per 100 000	EQA	% adeq perf	Number	per 5 000 000	Number	per 10 000 000	EQA	% adeq perf
2007	4 048	2.8	–	–	965	34	280	20	–	–
2008	4 048	2.9	–	–	965	34	280	20	–	–

Note: for routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extra-pulmonary and ss-/HIV+ TB, as well as DST of re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population. EQA column shows number of laboratories for which EQA was done. Adeq perf; adequate performance for microscopy based on results of EQA.

System for managing drug supplies and laboratory equipment

	Central level			Peripheral level		
	2005	2006	2007	2005	2006	2007
Stock-outs of laboratory supplies?	–	No	No	–	No	No
Stock-outs of first-line anti-TB drugs?	No	No	–	No	No	–

Monitoring and evaluation system, and impact measurement

NTP publishes annual report?	Yes (since 1991)
% of BMUs reporting to next level in 2007	
Case-finding	100%
Treatment outcomes	66%

Burden and impact assessment		last	next
In-depth analysis of routine surveillance data	Yes	2007	2008
Prevalence of disease survey	Yes, national	2007	2008
Prevalence of infection survey	Yes, national	2007	2008
Drug resistance survey	Yes, sub-national	2002–2006	–
Mortality survey	Yes	2007	2008
Analysis of vital registration data	Yes	2007	2008

MDR-TB, TB/HIV AND OTHER CHALLENGES

Multidrug-resistant TB (MDR-TB)

	2005	2006	2007
	Number (% of estimated ss+ MDR-TB)		
Estimated incidence of ss+ MDR cases	30 455	30 926	31 397
Diagnosed and notified	6 581 (22%)	3949 (13%)	5297 (17%)
Registered for treatment	451 (1.5%)	391 (1.3%)	211 (0.67%)
GLC	451	391	211
non-GLC	–	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES (*continued*)

Detection and treatment of HIV in TB patients, 2007

TB patients for whom the HIV test result was known	87 444
as % of all notified TB patients	41
TB patients with positive HIV test	2 401
as % of all estimated HIV+ TB cases	9.3
HIV+ TB patients started or continued on CPT	–
as % of HIV+ TB patients notified	–
HIV+ TB patients started or continued on ART	–
as % of HIV+ TB patients notified	–

Screening for TB in HIV-positive patients, 2007

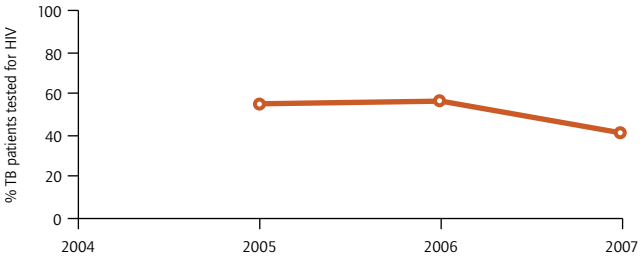
HIV+ patients in HIV care or ART register	267 513
Screened for TB	146 105
as % of HIV+ patients in HIV care or ART register	55
Started on TB treatment	5 985
as % of HIV+ patients in HIV care or ART register	2.2
Started on IPT	5 768
as % of HIV+ patients without TB in HIV care or ART register	2.2

High-risk groups, 2007

Number of close contacts of ss+ TB patients screened	–
Number of TB cases identified among contacts	–
% of contacts with TB	–
Contacts started on IPT	–
% of contacts without TB on IPT	–

HIV testing for TB patients

The percentage of TB patients tested for HIV was 41% in 2007, a slight decrease compared with 2005 and 2006



CPT and ART for HIV-positive TB patients

CONTRIBUTING TO HEALTH SYSTEM STRENGTHENING

The main health system-related challenges for TB control are lack of integration between disease-specific public health programmes and the primary health-care network, and inadequate linkages between the civilian and penitentiary health-care services. Integration of TB control into primary health-care services has started, and the links between TB control and the penitentiary system are improving.

Practical Approach to Lung Health (PAL), 2007

Number of health-care facilities providing PAL services	–	As % of total number of health-care facilities	–

ENGAGING ALL CARE PROVIDERS

Public-public and public-private approaches (PPM), 2007

Number of providers collaborating with the NTP[c]

	Number collaborating (total number of providers)	% total notified TB Diagnosed	Treated
Public sector	5 285 (5 285)	–	–
Private sector	– (–)	–	–

International Standards for Tuberculosis Care (ISTC)

ISTC endorsed by professional organizations?	Yes
By which organizations:	
Russian association of phtisiologists	
ISTC included in medical curriculum?	Yes

EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

Advocacy, communication and social mobilization (ACSM)

There are 140 patient-centered organizations or networks involved in TB advocacy activities and DOTS implementation.

Community participation in TB care and Patients' Charter

The Russian Red Cross is involved in activities related to increased case-finding in the community in two districts. The Patients' Charter is not being used.

ENABLING AND PROMOTING RESEARCH

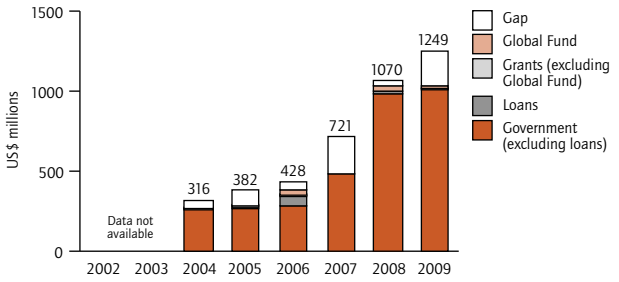
Programme-based operational research, 2007

Operational research budget (% of NTP budget)	0.7%

FINANCING

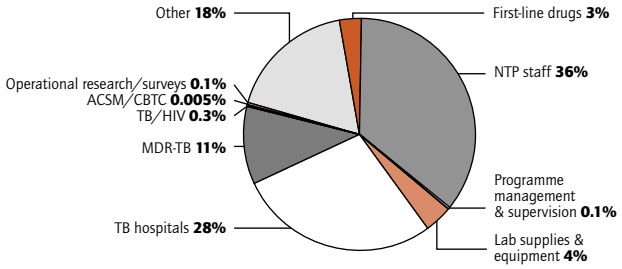
a. NTP budget by source of funding

Substantial increase in funding needs for 2008–2009, with most funding provided by the government; funding gap is just over US$ 200 million in 2009



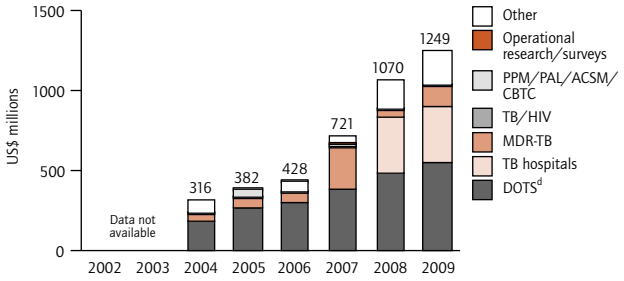
b. NTP budget line items in 2009

Largest budget component is for staff dedicated to TB control (including those working in TB hospitals), followed by TB hospitals (which includes all running costs besides staff)



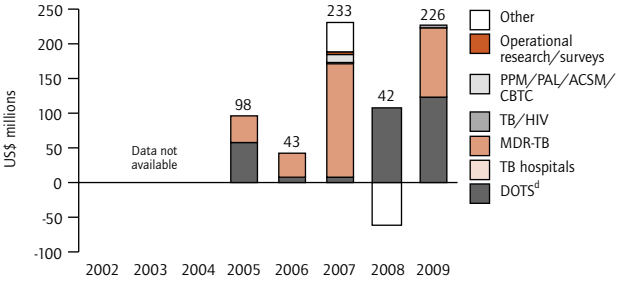
c. NTP budget by line item

Increased funding needs for 2008–2009 mostly reflects newly available data about the non-staff budget required for TB hospitals; MDR budget is for 4200 patients in 2008 and 9800 patients in 2009



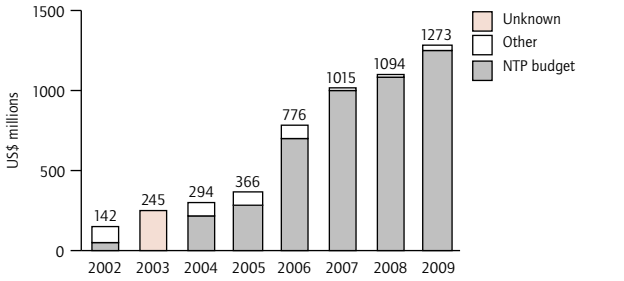
d. NTP funding gap by line item

Funding gap within DOTS is for dedicated staff and within MDR-TB the gap is for second-line drugs



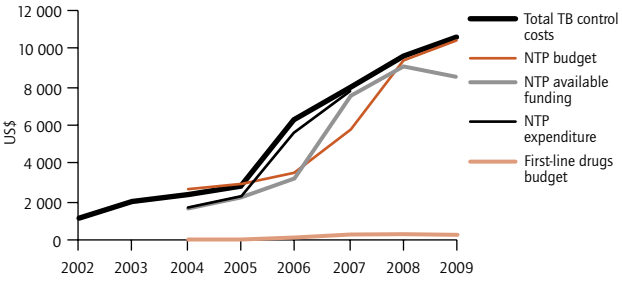
e. Total TB control costs by line item[1]

Increasing total costs as more information about the costs associated with TB hospitals are included; "other" includes fluorography



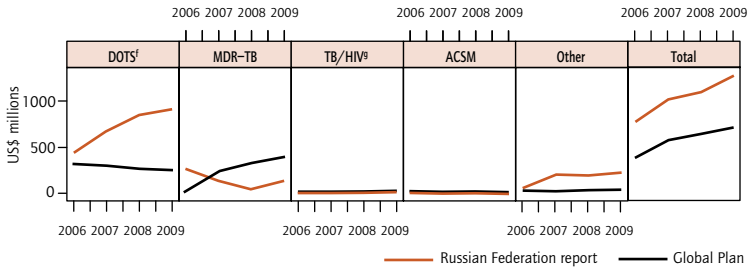
f. Per patient costs, budgets and expenditures[2]

Highest costs and budget per patient among all HBCs; total costs, budget and expenditure per patient are increasing



g. Global Plan compared with country reports[e]

Costs for TB control in country report much higher in total and for DOTS than costs estimated in Global Plan; costs for MDR-TB are lower, due to smaller numbers of patients to be treated compared with the targets of the Global MDR/XDR-TB Response Plan



h. NTP budget and funding gap by Stop TB Strategy component (US$ millions)

	2009 BUDGET	GAP
DOTS expansion and enhancement	890	123
TB/HIV, MDR-TB and other challenges	137	104
Health system strengthening	0	0
Engage all care providers	0	0
People with TB, and communities	0.1	0
Research and surveys	1.8	0
Other	220	0

SOURCES, METHODS AND ABBREVIATIONS

a–g Please see footnotes page 169.

1 Total TB control costs for 2002–2007 are based on expenditure, whereas those for 2008–2009 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

2 NTP available funding for 2004–2007 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003 and 2008–2009 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.

– indicates not available or not applicable; pop, population; ss+, sputum smear-positive; ss–, sputum smear-negative pulmonary; unk, pulmonary – sputum smear not done or result unknown.

South Africa

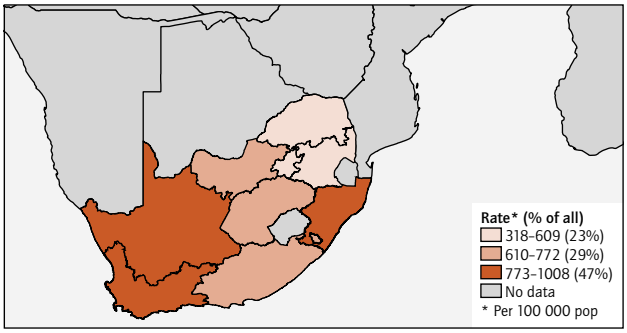
The case detection rate has remained above target since 2003; however, treatment success rates have remained low, with high default and death rates. South Africa reports the highest number of confirmed MDR-TB and XDR-TB cases in the region. Collaborative TB/HIV activities are being scaled up across the country. In 2007, almost 40% of notified TB patients were tested for HIV, and 35% and 67% of HIV-positive TB patients were provided with ART and CPT respectively. New approaches to trace treatment defaulters are being tested in selected areas. Considerable efforts have been made to estimate the funding requirements for TB control, although decentralization of planning and budgeting to provinces makes this challenging. A comprehensive costing study aimed at improving the accuracy of current estimates of funding needs and funding gaps is planned for 2009.

SURVEILLANCE AND EPIDEMIOLOGY

Population (thousands)[a] 48 577

Estimates of epidemiological burden, 2007[b]	ALL	IN HIV+ PEOPLE
Incidence		
All forms of TB (thousands of new cases per year)	461	336
All forms of TB (new cases per 100 000 pop/year)	948	691
Rate of change in incidence rate (%), 2006–2007	**0.9**	**0.9**
New ss+ cases (thousands of new cases per year)	174	117
New ss+ cases (per 100 000 pop/year)	358	242
HIV+ incident TB cases (% of all TB cases)	73	–
Prevalence		
All forms of TB (thousands of cases)	336	168
All forms of TB (cases per 100 000 pop)	692	345
2015 target for prevalence (cases per 100 000 pop)	**384**	–
Mortality		
All forms of TB (thousands of deaths per year)	112	94
All forms of TB (deaths per 100 000 pop/year)	**230**	193
2015 target for mortality (deaths per 100 000 pop/year)	**39**	–
Multidrug-resistant TB (MDR-TB)		
MDR-TB among all new TB cases (%)	1.8	–
MDR-TB among previously treated TB cases (%)	6.7	–

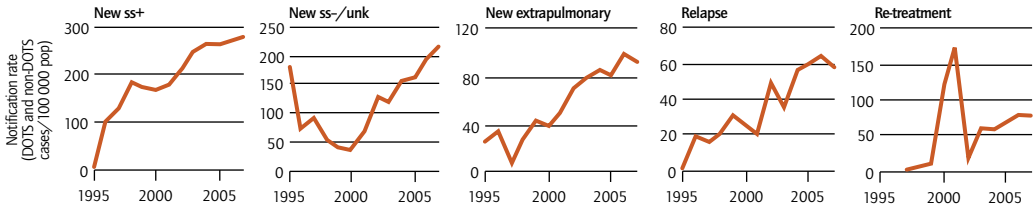
TB notification rate (new and relapse), 2007



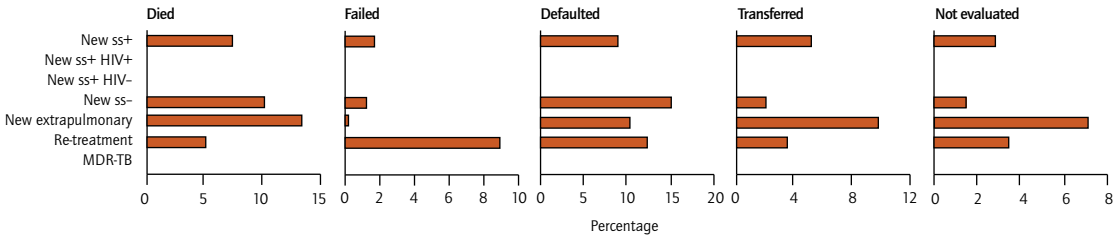
Total notifications, 2007

Notified new and relapse cases (thousands)	315
Notified new and relapse cases (per 100 000 pop/year)	649
Notified new ss+ cases (thousands)	136
Notified new ss+ cases (per 100 000 pop/year)	279
as % of new pulmonary cases	56
sex ratio (male/female)	1.2
DOTS case detection rate (% of estimated new ss+)	**78**
Notified new extrapulmonary cases (thousands)	46
as % of notified new cases	16
Notified new ss+ cases in children (<15 years) (thousands)	4.4
as % of notified new ss+ cases	3.3

Case notifications



Unfavourable treatment outcomes, 2006 cohorts



	2000	2001	2002	2003	2004	2005	2006	2007
DOTS coverage (%)	77	77	98	100	93	94	100	100
Notification rate (new & relapse cases/100 000 pop)	333	322	462	483	562	564	628	649
% notified new & relapse cases reported under DOTS	82	78	99	100	97	96	100	100
Notification rate (new ss+ cases/100 000 pop)	167	182	212	247	266	262	272	279
% notified new ss+ cases reported under DOTS	82	85	99	100	96	96	100	100
Case detection rate (all new cases, %)	43	44	53	53	56	55	60	62
Case detection rate (new ss+ cases, %)	76	70	72	77	78	75	77	78
Treatment success (new ss+ patients, %)	63	61	68	67	69	71	74	–
Re-treatment success (ss+ patients, %)	50	50	53	52	56	58	67	–

Note: notification, case detection and treatment success rates are for the whole country (i.e. DOTS and non-DOTS cases combined).

DOTS EXPANSION AND ENHANCEMENT

Overview of services for diagnosis of TB and treatment of patients

Description of basic management unit	Districts
Number of units (DOTS/total), 2007	53/53
Location of NTP services	
Rural Primary health care clinic, district hospital	
Urban Primary health care clinic, district hospital	
NTP services part of general primary health-care network?	Yes
Location where TB diagnosed	
Rural Primary health care facility, district hospital	
Urban Primary health care facility, district hospital	
Diagnosis free of charge?	Yes (all suspects)
Treatment supervised?	Some patients in all units
Intensive phase	Health-care worker, community member, family member
Continuation phase	Health-care worker, community member, family member
Category I regimen	2HRZE/4(HR)
Treatment free of charge	All patients in all units
External review missions	last: 2003
	next: 2009

Political commitment

National strategic plan?	Yes (2007–2011)
Mechanism for national interagency coordination?	Yes (established 2004)
National Stop TB Partnership?	No (planned 2009)

Financial indicators, 2008

(see final page for detailed presentation)	%
Government contribution to NTP budget (incl loans)	–
Government contribution to total cost TB control (incl loans)	–
Government health spending used for TB control	–
NTP budget funded	–

Per capita health financial indicators, 2008

	US$
NTP budget per capita	7.2
Total costs for TB control per capita	12
Funding gap per capita	–
Government health expenditure per capita (2005)	182
Total health expenditure per capita (2005)	437

Quality-assured bacteriology

National reference laboratory?	Yes

All TB laboratories performing EQA of smear microscopy or DST under the supervision of the National Reference Laboratory

	Smear				Culture		DST			
	Number	per 100 000	EQA	% adeq perf	Number	per 5 000 000	Number	per 10 000 000	EQA	% adeq perf
2007	249	0.5	241	93%	15	1.5	10	2.1	10	100%
2008	249	0.5	249	–	18	1.8	10	2.0	10	–

Note: for routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extra-pulmonary and ss-/HIV+ TB, as well as DST of re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population. EQA column shows number of laboratories for which EQA was done. Adeq perf; adequate performance for microscopy based on results of EQA.

System for managing drug supplies and laboratory equipment

	Central level			Peripheral level		
	2005	2006	2007	2005	2006	2007
Stock-outs of laboratory supplies?	–	No	No	–	No	No
Stock-outs of first-line anti-TB drugs?	No	No	Yes	No	All units	No

Monitoring and evaluation system, and impact measurement

NTP publishes annual report?	No
% of BMUs reporting to next level in 2007	
Case-finding	100%
Treatment outcomes	100%

Burden and impact assessment		last	next
In-depth analysis of routine surveillance data	Yes	–	2009
Prevalence of disease survey	Yes, sub-national	–	2010
Prevalence of infection survey	No	–	–
Drug resistance survey	Yes, national	2001–2002	2009
Mortality survey	No	–	–
Analysis of vital registration data	Yes	2007	2010

MDR-TB, TB/HIV AND OTHER CHALLENGES

Multidrug-resistant TB (MDR-TB)

	2005	2006	2007
	Number (% of estimated ss+ MDR-TB)		
Estimated incidence of ss+ MDR cases	10 312	10 553	10 708
Diagnosed and notified	2000 (19%)	6716 (64%)	7350 (69%)
Registered for treatment	(–%)	– (–%)	– (–%)
GLC	0	0	0
non-GLC	–	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES (*continued*)

Detection and treatment of HIV in TB patients, 2007

TB patients for whom the HIV test result was known	136 247
as % of all notified TB patients	39
TB patients with positive HIV test	87 764
as % of all estimated HIV+ TB cases	26
HIV+ TB patients started or continued on CPT	58 801
as % of HIV+ TB patients notified	67
HIV+ TB patients started or continued on ART	31 040
as % of HIV+ TB patients notified	35

Screening for TB in HIV-positive patients, 2007

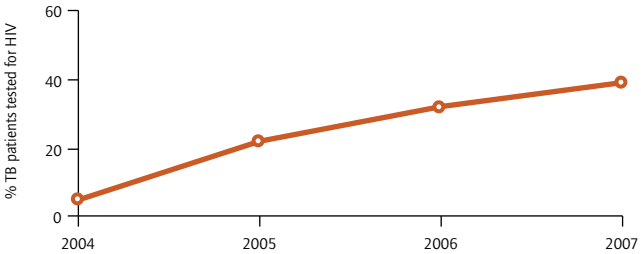
HIV+ patients in HIV care or ART register	379 672
Screened for TB	150 092
as % of HIV+ patients in HIV care or ART register	40
Started on TB treatment	15 521
as % of HIV+ patients in HIV care or ART register	4.1
Started on IPT	5 642
as % of HIV+ patients without TB in HIV care or ART register	1.5

High-risk groups, 2007

Number of close contacts of ss+ TB patients screened	–
Number of TB cases identified among contacts	–
% of contacts with TB	–
Contacts started on IPT	–
% of contacts without TB on IPT	–

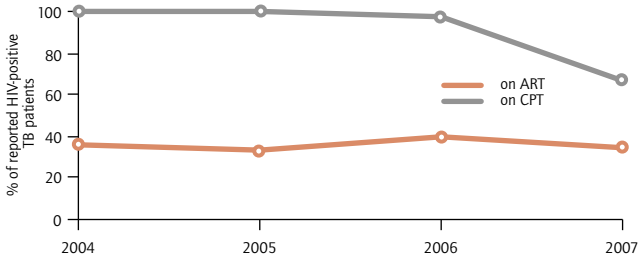
HIV testing for TB patients

The proportion of TB patients tested for HIV continues to increase steadily



CPT and ART for HIV-positive TB patients

The proportion of HIV-positive TB patients receiving CPT fell considerably in 2007



CONTRIBUTING TO HEALTH SYSTEM STRENGTHENING

–

Practical Approach to Lung Health (PAL), 2007

Number of health-care facilities providing PAL services	759	As % of total number of health-care facilities	22

ENGAGING ALL CARE PROVIDERS

Public-public and public-private approaches (PPM), 2007

Number of providers collaborating with the NTP[c]

	Number collaborating (total number of providers)	% total notified TB Diagnosed	Treated
Public sector	– (–)	–	–
Private sector	– (–)	–	–

International Standards for Tuberculosis Care (ISTC)

ISTC endorsed by professional organizations?	No
ISTC included in medical curriculum?	Yes

EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

Advocacy, communication and social mobilization (ACSM)

–

Community participation in TB care and Patients' Charter

By 2007, community-based care for MDR-TB patients had been introduced in selected districts in the provinces of KwaZulu-Natal and the Western Cape. Community-based care is included within national policy and guidelines, although implementation is variable. No data on use of the Patients' Charter were reported in 2008.

ENABLING AND PROMOTING RESEARCH

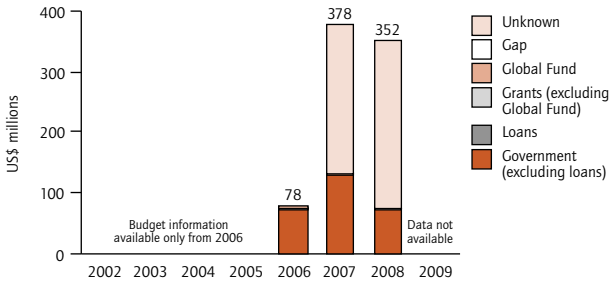
Programme-based operational research, 2007

Operational research budget (% of NTP budget)	0.1%

FINANCING

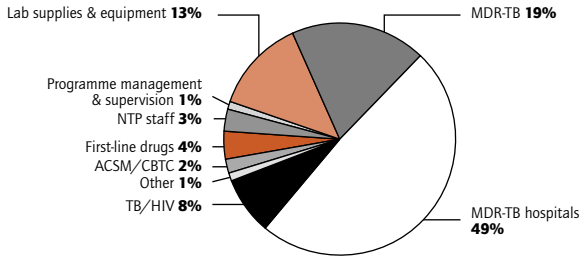
a. NTP budget by source of funding

Substantial increase in funding needs for 2007–2008; without complete information from provinces, sources of funding for a large part of the budget (mostly for MDR-TB) are unknown



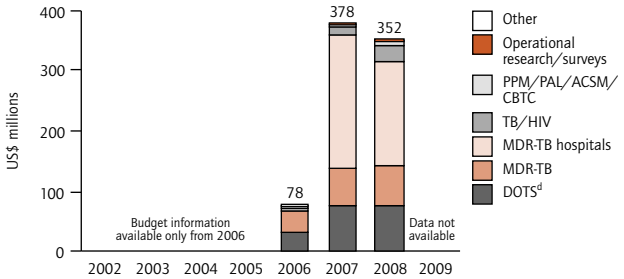
b. NTP budget line items in 2008

Share of budget for MDR-TB highest among HBCs



c. NTP budget by line item

Increased budget is mainly for MDR-TB, a large part of which is for the new hospital bed capacity required for MDR/XDR-TB patients

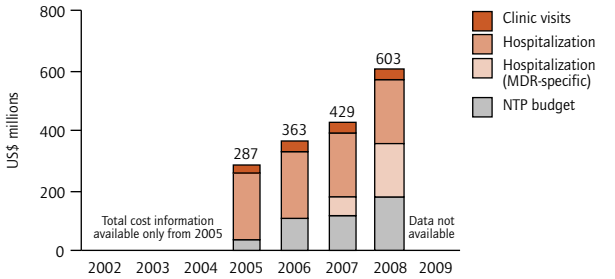


d. NTP funding gap by line item

Data on the funding available for TB control in South Africa are currently incomplete due to difficulties in compiling information about funding allocations at provincial level. From discussions among WHO, the NTP and staff in the national treasury, it seems likely that funding gaps do exist, especially for MDR/XDR-TB. The NTP is planning to conduct a comprehensive assessment of funding needs and funding gaps in 2009.

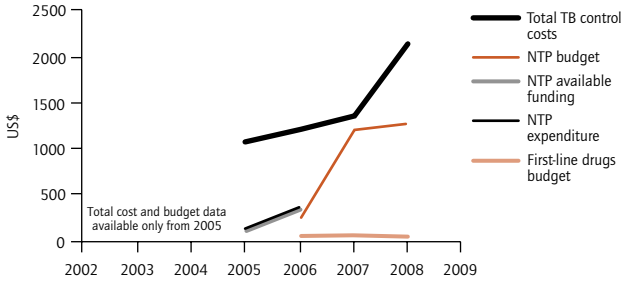
e. Total TB control costs by line item[1]

Estimated cost of hospitalization is based on 8112 dedicated TB beds for new TB patients; cost for hospitalization (MDR-specific) covers new bed capacity required to hospitalize patients for 6 months, and is mostly unfunded



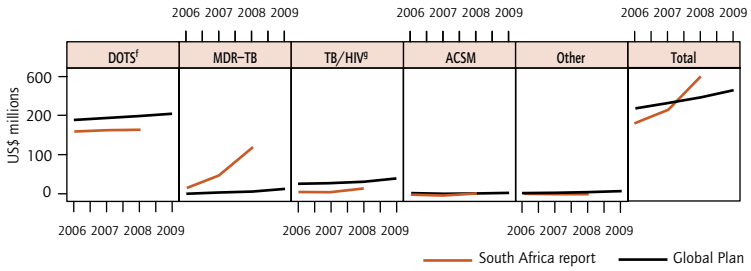
f. Per patient costs, budgets and expenditures[2]

Total cost, budget and expenditures per patient are increasing



g. Global Plan compared to country reports[e]

Country assessment of funding required for DOTS and MDR-TB is higher than the estimates in the Global Plan; for MDR-TB, this reflects current national policy that MDR/XDR-TB patients should be hospitalized for at least 6 months, and higher projections of patients to be treated



h. NTP budget and funding gap by Stop TB Strategy component (US$ millions)

	2009 BUDGET	GAP
DOTS expansion and enhancement		
TB/HIV, MDR-TB and other challenges		
Health system strengthening	DATA NOT	
Engage all care providers	AVAILABLE	
People with TB, and communities		
Research and surveys		
Other		

SOURCES, METHODS AND ABBREVIATIONS

[a–g] Please see footnotes page 169.

[1] Total TB control costs for 2005–2007 are based on expenditure, whereas those for 2008 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

[2] NTP available funding for 2005–2006 is based on the amount of funding actually received, using retrospective data.

– indicates not available or not applicable; pop, population; ss+, sputum smear-positive; ss–, sputum smear-negative pulmonary; unk, pulmonary – sputum smear not done or result unknown.

Thailand

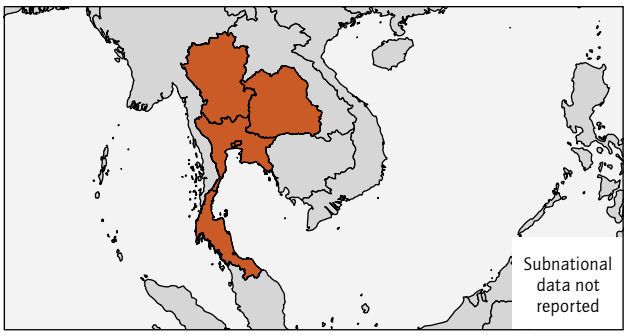
The case detection rate reached 72% in 2007, and the treatment success rate improved to 77% in 2006. Reasons why the treatment success rate is below the global target of 85% include high default and mortality rates, and incomplete reporting from care providers in Bangkok. Integrated TB/HIV services are widely available; in 2007, almost 70% of notified TB cases were screened for HIV, and 32% and 67% of HIV-positive TB patients were treated with ART and CPT, respectively. The latest survey of drug resistance found that 1.7% of new cases and 34.5% of previously treated cases have MDR-TB. Most patients with MDR-TB are managed by public and private providers that are not linked to the NTP. The NRL is a designated supranational laboratory for the region. However, quality assurance of the extensive laboratory network remains a challenge. In the context of recent health sector reforms, the TB cluster in Bangkok is responsible for technical guidance and surveillance. In 2008, a comprehensive analysis of the funding required for TB control indicated that around US$ 50 million per year is needed.

SURVEILLANCE AND EPIDEMIOLOGY

Population (thousands)[a] 63 884

Estimates of epidemiological burden, 2007[b]	ALL	IN HIV+ PEOPLE
Incidence		
All forms of TB (thousands of new cases per year)	91	15
All forms of TB (new cases per 100 000 pop/year)	142	24
Rate of change in incidence rate (%), 2006–2007	**0**	**0.002**
New ss+ cases (thousands of new cases per year)	39	5.4
New ss+ cases (per 100 000 pop/year)	62	8.5
HIV+ incident TB cases (% of all TB cases)	17	–
Prevalence		
All forms of TB (thousands of cases)	123	7.7
All forms of TB (cases per 100 000 pop)	**192**	12
2015 target for prevalence (cases per 100 000 pop)	**168**	–
Mortality		
All forms of TB (thousands of deaths per year)	14	3.9
All forms of TB (deaths per 100 000 pop/year)	**21**	6.0
2015 target for mortality (deaths per 100 000 pop/year)	**15**	–
Multidrug-resistant TB (MDR-TB)		
MDR-TB among all new TB cases (%)	1.7	–
MDR-TB among previously treated TB cases (%)	35	–

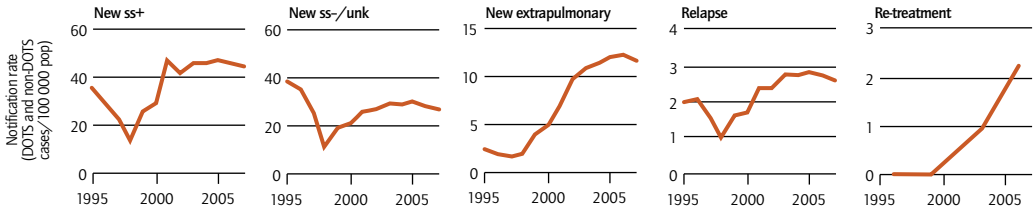
TB notification rate (new and relapse), 2007



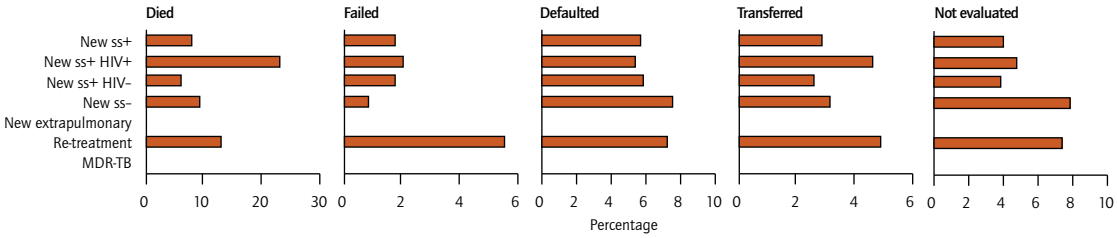
Total notifications, 2007

Notified new and relapse cases (thousands)	55
Notified new and relapse cases (per 100 000 pop/year)	86
Notified new ss+ cases (thousands)	28
Notified new ss+ cases (per 100 000 pop/year)	45
as % of new pulmonary cases	62
sex ratio (male/female)	2.4
DOTS case detection rate (% of estimated new ss+)	**72**
Notified new extrapulmonary cases (thousands)	7.5
as % of notified new cases	14
Notified new ss+ cases in children (<15 years) (thousands)	0.1
as % of notified new ss+ cases	0.3

Case notifications



Unfavourable treatment outcomes, 2006 cohorts



	2000	2001	2002	2003	2004	2005	2006	2007
DOTS coverage (%)	70	82	100	100	100	100	100	100
Notification rate (new & relapse cases/100 000 pop)	56	81	80	88	88	92	89	86
% notified new & relapse cases reported under DOTS	100	100	100	100	100	100	100	100
Notification rate (new ss+ cases/100 000 pop)	29	46	41	46	45	47	46	45
% notified new ss+ cases reported under DOTS	100	100	100	100	100	100	100	100
Case detection rate (all new cases, %)	38	55	55	60	60	63	60	58
Case detection rate (new ss+ cases, %)	48	76	68	74	74	77	74	72
Treatment success (new ss+ patients, %)	69	75	74	73	74	75	77	–
Re-treatment success (ss+ patients, %)	–	49	62	62	56	74	62	–

Note: notification, case detection and treatment success rates are for the whole country (i.e. DOTS and non-DOTS cases combined).

DOTS EXPANSION AND ENHANCEMENT

Overview of services for diagnosis of TB and treatment of patients

Description of basic management unit	Provincial hospitals
Number of units (DOTS/total), 2007	847/847
Location of NTP services	
Rural Community Hospital	
Urban General and regional hospital or BMA health centre	
NTP services part of general primary health-care network?	Yes
Location where TB diagnosed	
Rural District hospitals	
Urban Provincial hospitals	
Diagnosis free of charge?	Yes (all suspects)
Treatment supervised?	Some patients in some units
Intensive phase	Health-care worker, community member, family member
Continuation phase	Health-care worker, community member, family member
Category I regimen	2HRZE/4HR
Treatment free of charge	All patients in all units
External review missions	last: 2007
	next: 2009

Political commitment

National strategic plan?	Yes (2006–2015)
Mechanism for national interagency coordination?	No (planned 2010)
National Stop TB Partnership?	No (planned 2010)

Financial indicators, 2009

(see final page for detailed presentation)	%
Government contribution to NTP budget (incl loans)	92
Government contribution to total cost TB control (incl loans)	92
Government health spending used for TB control	1.3
NTP budget funded	94

Per capita health financial indicators, 2009

	US$
NTP budget per capita	0.8
Total costs for TB control per capita	0.8
Funding gap per capita	0.05
Government health expenditure per capita (2005)	63
Total health expenditure per capita (2005)	98

Quality-assured bacteriology

National reference laboratory?	Yes

All TB laboratories performing EQA of smear microscopy or DST under the supervision of the National Reference Laboratory

	Smear				Culture		DST			
	Number	per 100 000	EQA	% adeq perf	Number	per 5 000 000	Number	per 10 000 000	EQA	% adeq perf
2007	1 023	1.6	1 023	–	65	5.1	14	2.2	14	–
2008	1 023	1.6	1 023	–	65	5.1	14	2.2	14	–

Note: for routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extra-pulmonary and ss–/HIV+ TB, as well as DST of re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population. EQA column shows number of laboratories for which EQA was done. Adeq perf; adequate performance for microscopy based on results of EQA.

System for managing drug supplies and laboratory equipment

	Central level			Peripheral level		
	2005	2006	2007	2005	2006	2007
Stock-outs of laboratory supplies?	–	No	No	–	No	No
Stock-outs of first-line anti-TB drugs?	No	No	No	Yes	No	No

Monitoring and evaluation system, and impact measurement

NTP publishes annual report?	Yes (since 2007)
% of BMUs reporting to next level in 2007	
Case-finding	89%
Treatment outcomes	89%

Burden and impact assessment		last	next
In-depth analysis of routine surveillance data	Yes	2007	2008
Prevalence of disease survey	Yes	2006	2012
Prevalence of infection survey	No	–	–
Drug resistance survey	Yes, national	2006	–
Mortality survey	No	–	–
Analysis of vital registration data	No	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES

Multidrug-resistant TB (MDR-TB)

	2005	2006	2007
	Number (% of estimated ss+ MDR-TB)		
Estimated incidence of ss+ MDR cases	1 896	1 910	1 923
Diagnosed and notified	– (–%)	– (–%)	– (–%)
Registered for treatment	– (–%)	– (–%)	– (–%)
GLC	0	0	0
non-GLC	–	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES (*continued*)

Detection and treatment of HIV in TB patients, 2007

TB patients for whom the HIV test result was known	37 744
as % of all notified TB patients	69
TB patients with positive HIV test	7 615
as % of all estimated HIV+ TB cases	49
HIV+ TB patients started or continued on CPT	5 080
as % of HIV+ TB patients notified	67
HIV+ TB patients started or continued on ART	2 456
as % of HIV+ TB patients notified	32

Screening for TB in HIV-positive patients, 2007

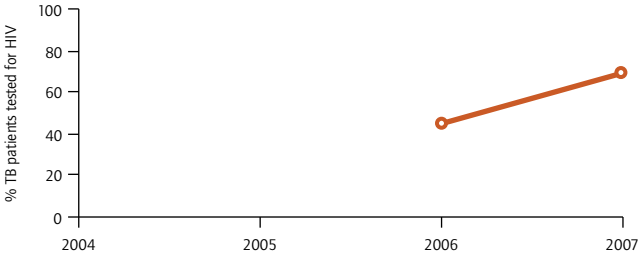
HIV+ patients in HIV care or ART register	–
Screened for TB	23 593
as % of HIV+ patients in HIV care or ART register	–
Started on TB treatment	2 747
as % of HIV+ patients in HIV care or ART register	–
Started on IPT	–
as % of HIV+ patients without TB in HIV care or ART register	–

High-risk groups, 2007

Number of close contacts of ss+ TB patients screened	–
Number of TB cases identified among contacts	–
% of contacts with TB	–
Contacts started on IPT	–
% of contacts without TB on IPT	–

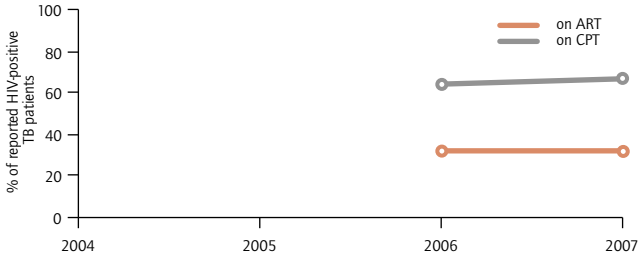
HIV testing for TB patients

The proportion of TB patients screened for HIV increased substantially between 2006 and 2007



CPT and ART for HIV-positive TB patients

The proportion of HIV-positive TB patients receiving ART in 2007 was the same as in 2006; the proportion of patients receiving CPT has increased slightly



CONTRIBUTING TO HEALTH SYSTEM STRENGTHENING

Extensive reform of the health sector, including decentralization and the establishment of a national health insurance scheme, has generated challenges for TB control. Notable examples include their effect on managerial capacity, human resources, and monitoring and evaluation. Reform has also presented opportunities in the form of better coverage of basic health-care services and reduced bureaucracy. The NTP has repositioned itself by shifting its focus from service delivery to technical assistance, and is working towards strengthened and integrated management and surveillance.

Practical Approach to Lung Health (PAL), 2007

Number of health-care facilities providing PAL services	0	As % of total number of health-care facilities	0

ENGAGING ALL CARE PROVIDERS

Public-public and public-private approaches (PPM), 2007

Number of providers collaborating with the NTP[c]

	Number collaborating (total number of providers)	% total notified TB Diagnosed	Treated
Public sector	985 (985)	100	100
Private sector	78 (354)	–	–

International Standards for Tuberculosis Care (ISTC)

ISTC endorsed by professional organizations?	No
ISTC included in medical curriculum?	No

EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

Advocacy, communication and social mobilization (ACSM)

–

Community participation in TB care and Patients' Charter

Activities to involve communities in TB control are mostly restricted to migrant populations. There are plans to scale-up community-based activities throughout the country. No data on use of the Patients' Charter were reported in 2008.

ENABLING AND PROMOTING RESEARCH

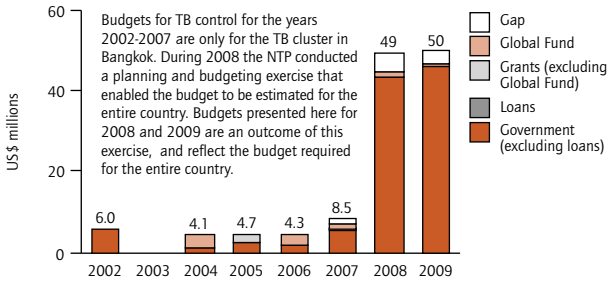
Programme-based operational research, 2007

Operational research budget (% of NTP budget)	0%

FINANCING

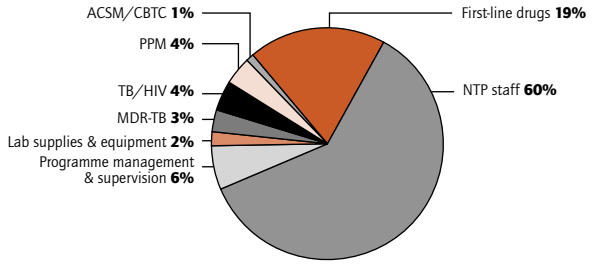
a. NTP budget by source of funding

National budget for TB control is mainly financed by the Government; funding gap expected to be closed with Global Fund round 8



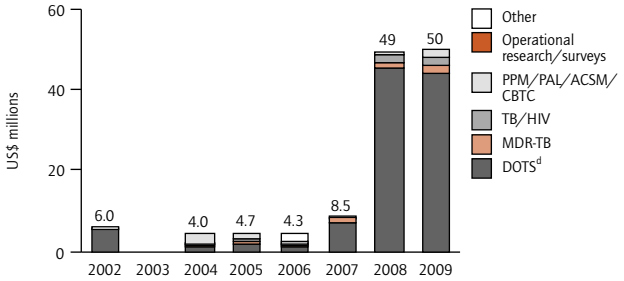
b. NTP budget line items in 2009

Largest share of the budget is for staff, first-line drugs and programme management and supervision



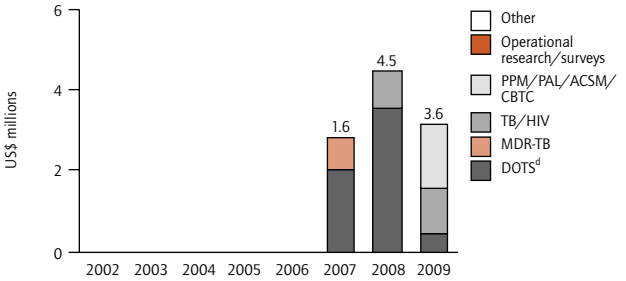
c. NTP budget by line item

Within DOTS, the largest budget is for NTP staff; budget for PPM increased in 2009



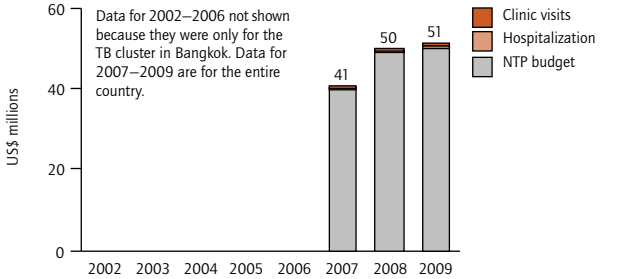
d. NTP funding gap by line item

Funding gap within DOTS is mainly for dedicated NTP staff; almost 80% of budget for PPM is unfunded



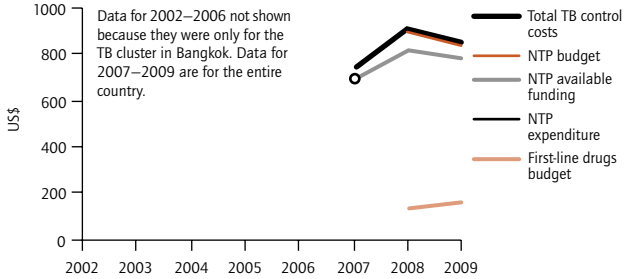
e. Total TB control costs by line item[1]

Costs for hospitalization and clinic visits represent a very small share of total costs, with hospitalization of 5% of new TB patients for an average of 5 days, and 8 clinic visits for new cases during treatment



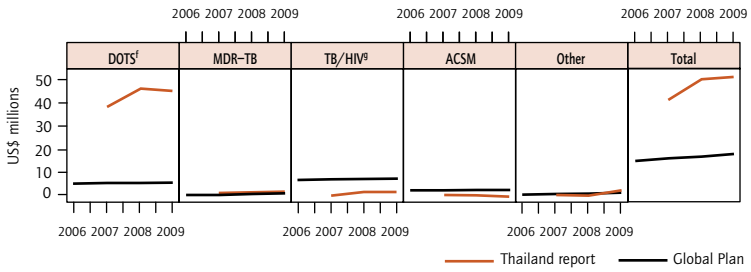
f. Per patient costs, budgets and expenditures[2]

NTP budget per patient is high compared with other HBCs in South-East Asia Region, as expected given Thailand's middle-income status; budget per patient for first-line drugs specifically highest among HBCs



g. Global Plan compared with country reports[e]

Country assessment of funding required for TB control far higher than Global Plan estimate, mainly due to higher budget for first-line drugs and NTP staff



h. NTP budget and funding gap by Stop TB Strategy component (US$ millions)

	2009 BUDGET	GAP
DOTS expansion and enhancement	44	0.4
TB/HIV, MDR-TB and other challenges	3.6	1.1
Health system strengthening	0	0
Engage all care providers	2.0	1.6
People with TB, and communities	0.4	0
Research and surveys	0	0
Other	0	0

SOURCES, METHODS AND ABBREVIATIONS

[a–g] Please see footnotes page 169.

[1] Total TB control costs for 2007 are based on expenditure, whereas those for 2008–2009 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

[2] NTP available funding for 2007 is based on the amount of funding actually received, using retrospective data; available funding for 2008–2009 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.

– indicates not available or not applicable; pop, population; ss+, sputum smear-positive; ss–, sputum smear-negative pulmonary; unk, pulmonary – sputum smear not done or result unknown.

Uganda

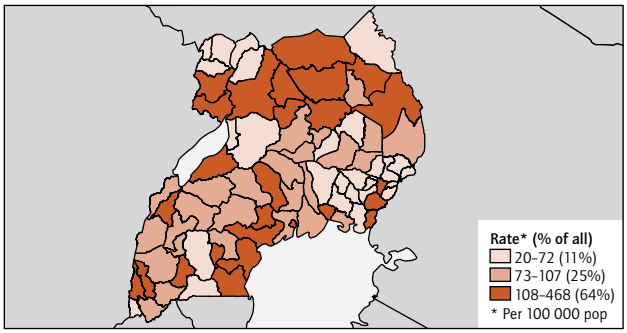
DOTS is implemented throughout the country, but the case detection rate has been below target and relatively stable since 2001. The treatment success rate remains low because of the high proportion of patients who die, default from treatment or for whom the treatment outcome is not evaluated. Training on collaborative TB/HIV activities based on standardized national guidelines has been provided to around half of the districts. Inadequate funding, linked in part to problems with disbursement of Global Fund grants, has hampered the progress of the national programme. Shortages of first-line anti-TB drugs have also been reported. To improve current estimates of the epidemiological burden of TB, a survey of the prevalence of TB disease is planned for 2009; however, there is inadequate funding for this project.

SURVEILLANCE AND EPIDEMIOLOGY

Population (thousands)[a] 30 884

Estimates of epidemiological burden, 2007[b]	ALL	IN HIV+ PEOPLE
Incidence		
All forms of TB (thousands of new cases per year)	102	39
All forms of TB (new cases per 100 000 pop/year)	330	128
Rate of change in incidence rate (%), 2006–2007	**–5.7**	**–8.6**
New ss+ cases (thousands of new cases per year)	42	14
New ss+ cases (per 100 000 pop/year)	136	45
HIV+ incident TB cases (% of all TB cases)	39	–
Prevalence		
All forms of TB (thousands of cases)	132	20
All forms of TB (cases per 100 000 pop)	**426**	64
2015 target for prevalence (cases per 100 000 pop)	**103**	–
Mortality		
All forms of TB (thousands of deaths per year)	29	16
All forms of TB (deaths per 100 000 pop/year)	**93**	52
2015 target for mortality (deaths per 100 000 pop/year)	**35**	–
Multidrug-resistant TB (MDR-TB)		
MDR-TB among all new TB cases (%)	0.5	–
MDR-TB among previously treated TB cases (%)	4.4	–

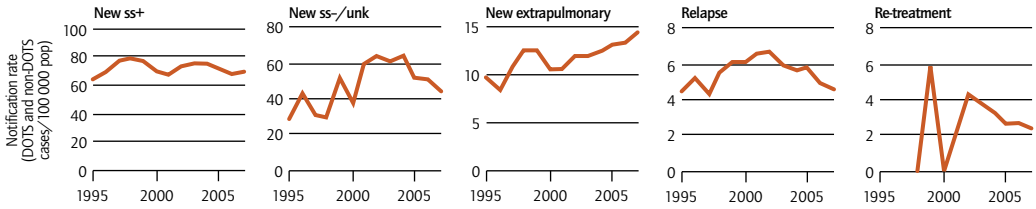
TB notification rate (new and relapse), 2007



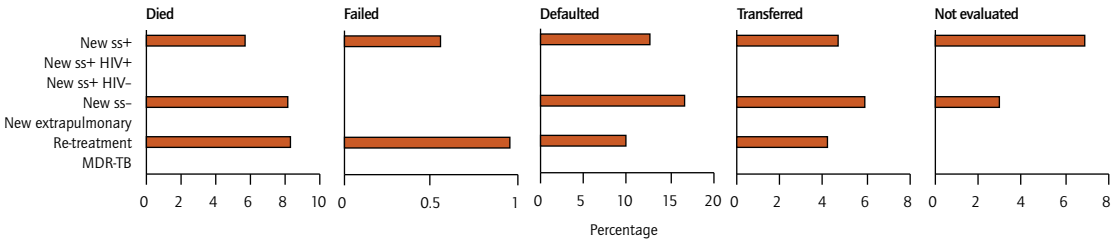
Total notifications, 2007

Notified new and relapse cases (thousands)	41
Notified new and relapse cases (per 100 000 pop/year)	132
Notified new ss+ cases (thousands)	21
Notified new ss+ cases (per 100 000 pop/year)	69
as % of new pulmonary cases	61
sex ratio (male/female)	1.5
DOTS case detection rate (% of estimated new ss+)	**51**
Notified new extrapulmonary cases (thousands)	4.5
as % of notified new cases	11
Notified new ss+ cases in children (<15 years) (thousands)	0.6
as % of notified new ss+ cases	2.7

Case notifications



Unfavourable treatment outcomes, 2006 cohorts



	2000	2001	2002	2003	2004	2005	2006	2007
DOTS coverage (%)	100	100	100	100	100	100	100	100
Notification rate (new & relapse cases/100 000 pop)	123	145	155	154	156	142	136	132
% notified new & relapse cases reported under DOTS	100	100	100	100	100	100	100	100
Notification rate (new ss+ cases/100 000 pop)	70	68	73	75	75	71	68	69
% notified new ss+ cases reported under DOTS	100	100	100	100	100	100	100	100
Case detection rate (all new cases, %)	34	38	38	37	39	37	38	39
Case detection rate (new ss+ cases, %)	51	47	47	47	48	47	48	51
Treatment success (new ss+ patients, %)	63	56	60	68	70	73	70	–
Re-treatment success (ss+ patients, %)	64	63	55	60	68	–	76	–

Note: notification, case detection and treatment success rates are for the whole country (i.e. DOTS and non-DOTS cases combined).

DOTS EXPANSION AND ENHANCEMENT

Overview of services for diagnosis of TB and treatment of patients

Description of basic management unit	Hospital
Number of units (DOTS/total), 2007	80/80
Location of NTP services	
Rural Health centre	
Urban Hospital	
NTP services part of general primary health-care network?	Yes
Location where TB diagnosed	
Rural Health centre	
Urban Hospital	
Diagnosis free of charge?	Yes (if TB is confirmed)
Treatment supervised?	All patients in some units
Intensive phase	Health-care worker, community member, family member
Continuation phase	Health-care worker, community member, family member
Category I regimen	2(HRZ)E2/6HE
Treatment free of charge	All patients in all units
External review missions	last: 2008 next: 2009

Political commitment

National strategic plan?	Yes (2006–2011)
Mechanism for national interagency coordination?	Yes (established 2003)
National Stop TB Partnership?	Yes (established 2004)

Financial indicators, 2009

(see final page for detailed presentation)	%
Government contribution to NTP budget (incl loans)	7.5
Government contribution to total cost TB control (incl loans)	14
Government health spending used for TB control	9.9
NTP budget funded	37

Per capita health financial indicators, 2009

	US$
NTP budget per capita	0.5
Total costs for TB control per capita	0.6
Funding gap per capita	0.3
Government health expenditure per capita (2005)	6.4
Total health expenditure per capita (2005)	22

Quality-assured bacteriology

National reference laboratory?	Yes

All TB laboratories performing EQA of smear microscopy or DST under the supervision of the National Reference Laboratory

	Smear				Culture		DST			
	Number	per 100 000	EQA	% adeq perf	Number	per 5 000 000	Number	per 10 000 000	EQA	% adeq perf
2007	716	2.3	716	81%	3	0.5	2	0.6	2.0	100%
2008	741	2.3	741	–	4	0.6	2	0.6	2.0	–

Note: for routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extra-pulmonary and ss–/HIV+ TB, as well as DST of re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population. EQA column shows number of laboratories for which EQA was done. Adeq perf; adequate performance for microscopy based on results of EQA.

System for managing drug supplies and laboratory equipment

	Central level			Peripheral level		
	2005	2006	2007	2005	2006	2007
Stock-outs of laboratory supplies?	–	No	No	–	Some units	Some units
Stock-outs of first-line anti-TB drugs?	Yes	Yes	Yes	Yes	Some units	Some units

Monitoring and evaluation system, and impact measurement

NTP publishes annual report?	Yes (since 2003)
% of BMUs reporting to next level in 2007	
Case-finding	100%
Treatment outcomes	99%

Burden and impact assessment		last	next
In-depth analysis of routine surveillance data	No	–	–
Prevalence of disease survey	Yes, national	–	2009
Prevalence of infection survey	Yes, national	1970	2009
Drug resistance survey	Yes, sub-national	1997	Ongoing
Mortality survey	No	–	–
Analysis of vital registration data	No	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES

Multidrug-resistant TB (MDR-TB)

	2005	2006	2007
	Number (% of estimated ss+ MDR-TB)		
Estimated incidence of ss+ MDR cases	508	497	485
Diagnosed and notified	46 (9.1%)	– (–%)	7 (1.4%)
Registered for treatment	– (–%)	– (–%)	7 (1.4%)
GLC	0	0	0
non-GLC	–	–	7

MDR-TB, TB/HIV AND OTHER CHALLENGES (*continued*)

Detection and treatment of HIV in TB patients, 2007

TB patients for whom the HIV test result was known	15 844
as % of all notified TB patients	38
TB patients with positive HIV test	9 526
as % of all estimated HIV+ TB cases	24
HIV+ TB patients started or continued on CPT	380
as % of HIV+ TB patients notified	4.0
HIV+ TB patients started or continued on ART	220
as % of HIV+ TB patients notified	2.3

Screening for TB in HIV-positive patients, 2007

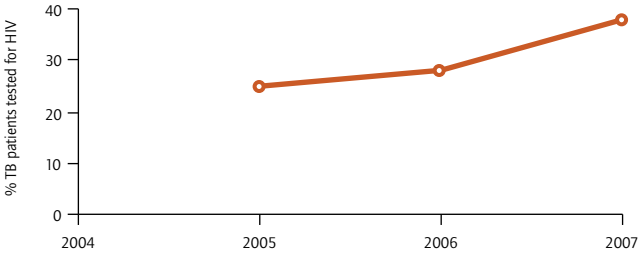
HIV+ patients in HIV care or ART register	244 969
Screened for TB	71 647
as % of HIV+ patients in HIV care or ART register	29
Started on TB treatment	3 566
as % of HIV+ patients in HIV care or ART register	1.5
Started on IPT	121
as % of HIV+ patients without TB in HIV care or ART register	0.1

High-risk groups, 2007

Number of close contacts of ss+ TB patients screened	–
Number of TB cases identified among contacts	–
% of contacts with TB	–
Contacts started on IPT	–
% of contacts without TB on IPT	–

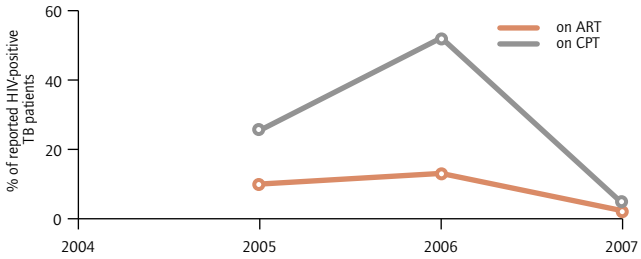
HIV testing for TB patients

The proportion of TB cases tested for HIV continues to increase



CPT and ART for HIV-positive TB patients

Provision of CPT and ART under-reported in 2007



CONTRIBUTING TO HEALTH SYSTEM STRENGTHENING

The main weaknesses of the health system – a shortage of qualified personnel, poor access to primary health care and low levels of funding for health care – have had a negative impact on the NTP, which is integrated into the primary health-care system. The NTP is improving the capacities of laboratories and human resources through training, monitoring and quality control, all of which benefit the entire health-care system. Engagement of communities by the NTP is strengthening the role of civil society in the country.

Practical Approach to Lung Health (PAL), 2007

Number of health-care facilities providing PAL services	–	As % of total number of health-care facilities	–

ENGAGING ALL CARE PROVIDERS

Public-public and public-private approaches (PPM), 2007

Number of providers collaborating with the NTP[c]

	Number collaborating (total number of providers)	% total notified TB Diagnosed	% total notified TB Treated
Public sector	80 (269)	–	–
Private sector	252 (–)	–	–

International Standards for Tuberculosis Care (ISTC)

ISTC endorsed by professional organizations?	No
ISTC included in medical curriculum?	No

EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

Advocacy, communication and social mobilization (ACSM)

The NTP works in close collaboration with the ACSM Working Group of the national Stop TB Partnership to guide and implement ACSM activities. A national ACSM strategy for control of TB and TB/HIV has been developed.

Community participation in TB care and Patients' Charter

Community-based care has been available throughout the country since 2005. Patient support in rural areas is usually provided by neighbours or friends who are in regular contact with the health services. In urban areas, this support is usually provided by family members. Activities to raise awareness about TB are conducted mostly through sensitization of village leaders in rural areas, and through media campaigns in urban areas. The Patients' Charter is being used.

ENABLING AND PROMOTING RESEARCH

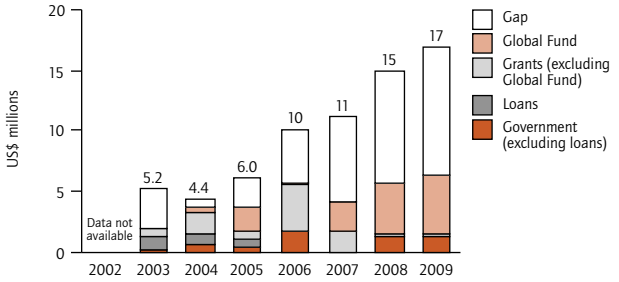
Programme-based operational research, 2007

Operational research budget (% of NTP budget)	2.5%

FINANCING

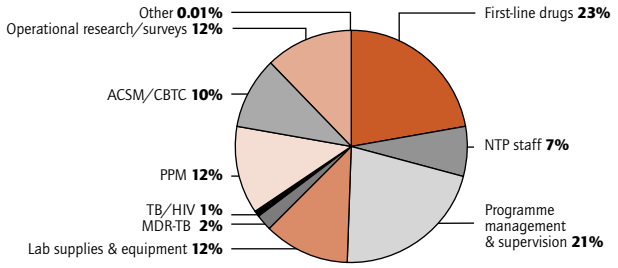
a. NTP budget by source of funding

Increasing NTP budget and increasing funding gaps



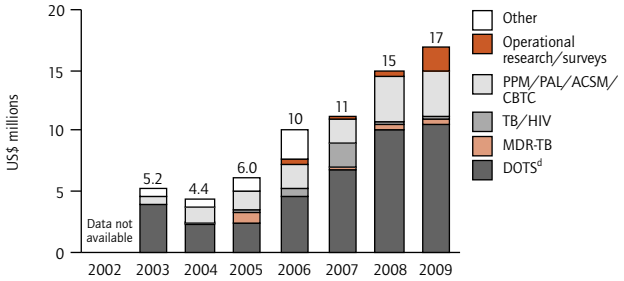
b. NTP budget line items in 2009

DOTS implementation accounts for 62% of budget, followed by ACSM including community TB care



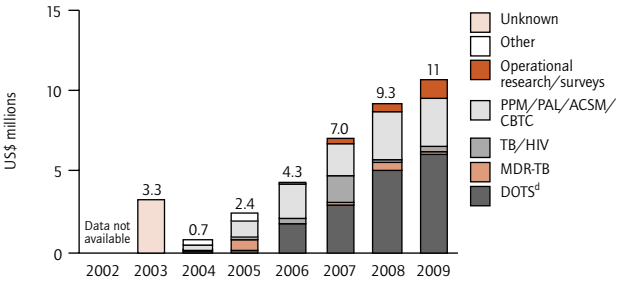
c. NTP budget by line item

Within DOTS, increased funding needs for programme management and supervision activities; operational research includes budget for disease prevalence survey in 2009



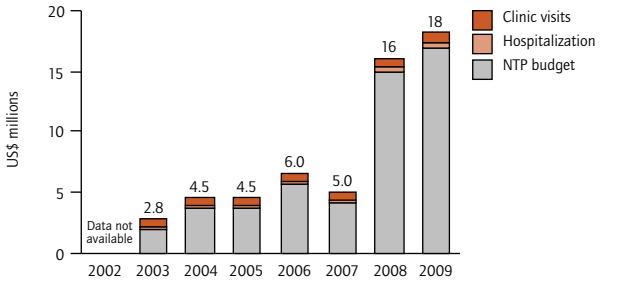
d. NTP funding gap by line item

Funding gap within DOTS is mainly for first-line drugs and routine programme management; half of the budget required for a disease prevalence survey is unfunded



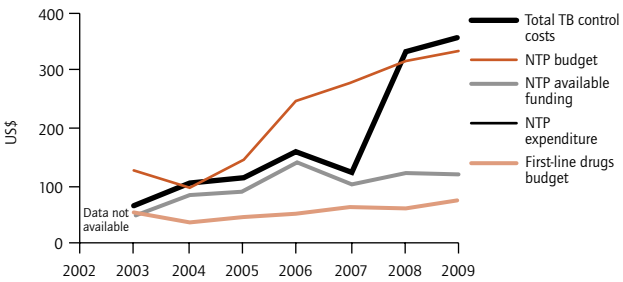
e. Total TB control costs by line item[1]

Cost of clinic visits based on 12 visits for DOT per TB patient (2003–2009); small number of visits to health facilities reflects role of community volunteers



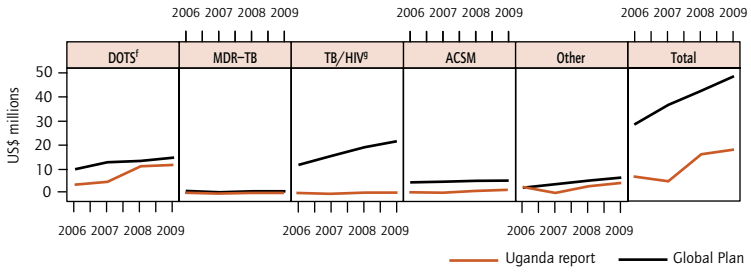
f. Per patient costs, budgets and expenditures[2]

To date, expenditure data have not been reported



g. Global Plan compared with country reports[e]

Biggest difference between country report and Global Plan is collaborative TB/HIV activities, which at least in part reflects funding and implementation of some activities by the national AIDS control programme; expenditure data are not available to allow comparison for 2006 and 2007



h. NTP budget and funding gap by Stop TB Strategy component (US$ millions)

	2009 BUDGET	GAP
DOTS expansion and enhancement	11	6.1
TB/HIV, MDR-TB and other challenges	0.6	0.4
Health system strengthening	0.002	0.002
Engage all care providers	2.0	2.0
People with TB, and communities	1.8	1.1
Research and surveys	2.1	1.1
Other	0	0

SOURCES, METHODS AND ABBREVIATIONS

[a–g] Please see footnotes page 169.

[1] Total TB control costs for 2003–2007 are based on available funding, whereas those for 2008–2009 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

[2] NTP available funding for 2003–2009 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.

– indicates not available or not applicable; pop, population; ss+, sputum smear-positive; ss–, sputum smear-negative pulmonary; unk, pulmonary – sputum smear not done or result unknown.

United Republic of Tanzania

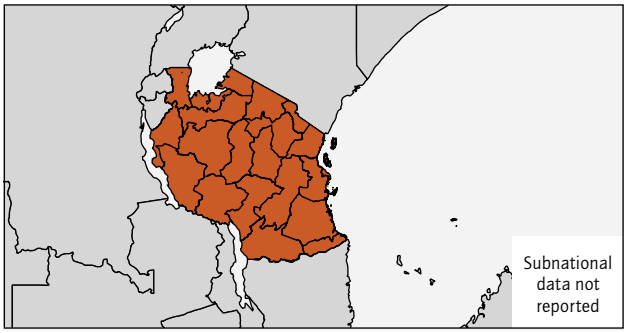
The case detection rate has been relatively stable since 2001 and well below the global target. The treatment success rate for new smear-positive TB cases reached the global target in 2006. Following rapid expansion of collaborative TB/HIV activities, 50% of TB cases are being tested for HIV and 31% and 72% of HIV-positive TB cases are being provided with ART and CPT, respectively. Further expansion of TB/HIV activities, scale-up of community-based TB care, and formal collaboration with the private sector are expected to improve rates of case detection and treatment success. Programmatic management of MDR-TB began in 2007 on a small scale. A survey of the prevalence of disease in 2009 and the results of an in-depth analysis of surveillance data will be used to update existing estimates of the epidemiological burden of TB.

SURVEILLANCE AND EPIDEMIOLOGY

Population (thousands)[a] 40 454

Estimates of epidemiological burden, 2007[b]	ALL	IN HIV+ PEOPLE
Incidence		
All forms of TB (thousands of new cases per year)	120	56
All forms of TB (new cases per 100 000 pop/year)	297	139
Rate of change in incidence rate (%), 2006–2007	**–4.4**	**–5.2**
New ss+ cases (thousands of new cases per year)	49	20
New ss+ cases (per 100 000 pop/year)	120	49
HIV+ incident TB cases (% of all TB cases)	47	–
Prevalence		
All forms of TB (thousands of cases)	136	28
All forms of TB (cases per 100 000 pop)	**337**	70
2015 target for prevalence (cases per 100 000 pop)	**107**	–
Mortality		
All forms of TB (thousands of deaths per year)	32	20
All forms of TB (deaths per 100 000 pop/year)	**78**	49
2015 target for mortality (deaths per 100 000 pop/year)	**21**	–
Multidrug-resistant TB (MDR-TB)		
MDR-TB among all new TB cases (%)	1.1	–
MDR-TB among previously treated TB cases (%)	7.9	–

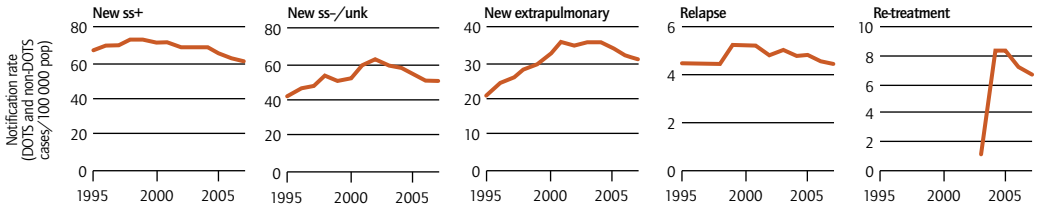
TB notification rate (new and relapse), 2007



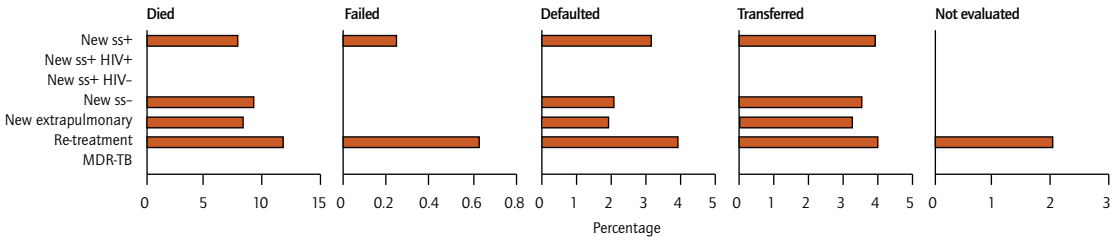
Total notifications, 2007

Notified new and relapse cases (thousands)	59
Notified new and relapse cases (per 100 000 pop/year)	147
Notified new ss+ cases (thousands)	25
Notified new ss+ cases (per 100 000 pop/year)	61
as % of new pulmonary cases	54
sex ratio (male/female)	1.7
DOTS case detection rate (% of estimated new ss+)	**51**
Notified new extrapulmonary cases (thousands)	13
as % of notified new cases	22
Notified new ss+ cases in children (<15 years) (thousands)	0.4
as % of notified new ss+ cases	1.7

Case notifications



Unfavourable treatment outcomes, 2006 cohorts



	2000	2001	2002	2003	2004	2005	2006	2007
DOTS coverage (%)	100	100	100	100	100	100	100	100
Notification rate (new & relapse cases/100 000 pop)	161	177	169	168	167	159	150	147
% notified new & relapse cases reported under DOTS	100	100	100	100	100	100	100	100
Notification rate (new ss+ cases/100 000 pop)	71	71	68	68	69	66	63	61
% notified new ss+ cases reported under DOTS	100	100	100	100	100	100	100	100
Case detection rate (all new cases, %)	46	48	47	47	48	47	47	48
Case detection rate (new ss+ cases, %)	52	51	48	49	51	50	50	51
Treatment success (new ss+ patients, %)	78	81	80	81	81	82	85	–
Re-treatment success (ss+ patients, %)	73	76	77	75	76	77	78	–

Note: notification, case detection and treatment success rates are for the whole country (i.e. DOTS and non-DOTS cases combined).

DOTS EXPANSION AND ENHANCEMENT

Overview of services for diagnosis of TB and treatment of patients

Description of basic management unit	Hospitals and health centres
Number of units (DOTS/total), 2007	157/157
Location of NTP services	
Rural Health centers and dispensaries	
Urban Hospitals and health centres	
NTP services part of general primary health-care network?	Yes
Location where TB diagnosed	
Rural Health centres and dispensaries	
Urban Hospitals and health centres	
Diagnosis free of charge?	Yes (all suspects)
Treatment supervised?	All patients in all units
Intensive phase	Health-care worker, community member, family member
Continuation phase	Health-care worker, community member, family member
Category I regimen	2HRZE/4HR
Treatment free of charge	All patients in all units
External review missions	last: –
	next: –

Political commitment

National strategic plan?	Yes (2004–2009)
Mechanism for national interagency coordination?	No (planned 2009)
National Stop TB Partnership?	No (planned 2009)

Financial indicators, 2009

(see final page for detailed presentation)	%
Government contribution to NTP budget (incl loans)	29
Government contribution to total cost TB control (incl loans)	39
Government health spending used for TB control	8.2
NTP budget funded	70

Per capita health financial indicators, 2009

	US$
NTP budget per capita	0.6
Total costs for TB control per capita	0.7
Funding gap per capita	0.2
Government health expenditure per capita (2005)	9.5
Total health expenditure per capita (2005)	17

Quality-assured bacteriology

National reference laboratory?	Yes

All TB laboratories performing EQA of smear microscopy or DST under the supervision of the National Reference Laboratory

	Smear				Culture		DST			
	Number	per 100 000	EQA	% adeq perf	Number	per 5 000 000	Number	per 10 000 000	EQA	% adeq perf
2007	717	1.8	–	–	3	0.4	1	0.2	1.0	–
2008	717	1.7	717	–	3	0.4	1	0.2	1.0	–

Note: for routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extra-pulmonary and ss–/HIV+ TB, as well as DST of re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population. EQA column shows number of laboratories for which EQA was done. Adeq perf; adequate performance for microscopy based on results of EQA.

System for managing drug supplies and laboratory equipment

	Central level			Peripheral level		
	2005	2006	2007	2005	2006	2007
Stock-outs of laboratory supplies?	–	No	No	–	No	No
Stock-outs of first-line anti-TB drugs?	No	No	No	No	All units	No

Monitoring and evaluation system, and impact measurement

NTP publishes annual report?	Yes (since 1992)
% of BMUs reporting to next level in 2007	
Case-finding	100%
Treatment outcomes	100%

Burden and impact assessment		last	next
In-depth analysis of routine surveillance data	Yes	2007	2008
Prevalence of disease survey	Yes, national	–	2009
Prevalence of infection survey	Yes, national	2004	–
Drug resistance survey	Yes, national	2007	–
Mortality survey	No	–	–
Analysis of vital registration data	No	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES

	2005	2006	2007
Multidrug-resistant TB (MDR-TB)	Number (% of estimated ss+ MDR-TB)		
Estimated incidence of ss+ MDR cases	1 350	1 327	1 301
Diagnosed and notified	10 (0.74%)	13 (0.98%)	169 (13%)
Registered for treatment	– (–%)	– (–%)	– (–%)
GLC	0	0	0
non-GLC	–	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES (*continued*)

Detection and treatment of HIV in TB patients, 2007

TB patients for whom the HIV test result was known	31 305
as % of all notified TB patients	50
TB patients with positive HIV test	14 669
as % of all estimated HIV+ TB cases	26
HIV+ TB patients started or continued on CPT	10 541
as % of HIV+ TB patients notified	72
HIV+ TB patients started or continued on ART	4 619
as % of HIV+ TB patients notified	31

Screening for TB in HIV-positive patients, 2007

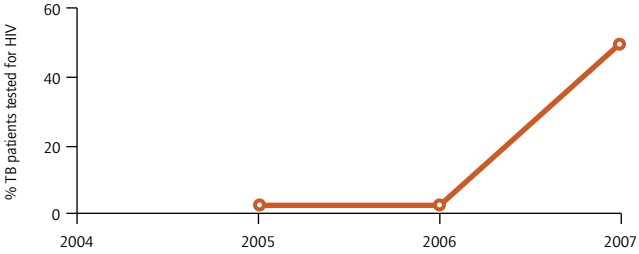
HIV+ patients in HIV care or ART register	–
Screened for TB	–
as % of HIV+ patients in HIV care or ART register	–
Started on TB treatment	–
as % of HIV+ patients in HIV care or ART register	–
Started on IPT	–
as % of HIV+ patients without TB in HIV care or ART register	–

High-risk groups, 2007

Number of close contacts of ss+ TB patients screened	–
Number of TB cases identified among contacts	–
% of contacts with TB	–
Contacts started on IPT	–
% of contacts without TB on IPT	–

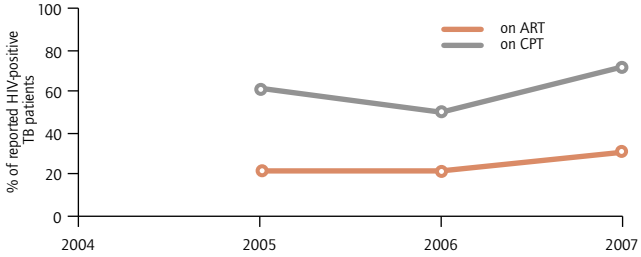
HIV testing for TB patients

The proportion of TB patients tested for HIV increased dramatically in 2007, reaching 50%



CPT and ART for HIV-positive TB patients

The proportion of HIV-positive TB patients receiving ART and CPT improved between 2006 and 2007



CONTRIBUTING TO HEALTH SYSTEM STRENGTHENING

The NTP is fully integrated into the primary health-care system, and planning and budgeting for TB control have been successfully harmonized with sector-wide planning frameworks. Refurbishment of laboratories to support TB diagnosis has helped to strengthen overall laboratory capacity. Shared resources such as transport facilities and the reporting network have been used to reduce transaction costs for the entire health system. Further integration of the procurement system is planned.

Practical Approach to Lung Health (PAL), 2007

Number of health-care facilities providing PAL services	0	As % of total number of health-care facilities	0

ENGAGING ALL CARE PROVIDERS

Public-public and public-private approaches (PPM), 2007

Number of providers collaborating with the NTP[c]

	Number collaborating (total number of providers)	% total notified TB Diagnosed	% total notified TB Treated
Public sector	– (–)	–	–
Private sector	12 (–)	–	–

International Standards for Tuberculosis Care (ISTC)

ISTC endorsed by professional organizations?	Yes
By which organizations:	–
ISTC included in medical curriculum?	Yes

EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

Advocacy, communication and social mobilization (ACSM)

An ACSM strategy has been drafted, and a KAP survey is planned for 2009. A club for former TB patients was recently established.

Community participation in TB care and Patients' Charter

The NTP has started to involve patients and communities in delivering care and in activities to sensitize the general population about TB in selected areas of the country. These activities will be scaled up to cover 31 districts by the end of 2010. No data on use of the Patients' Charter were reported in 2008.

ENABLING AND PROMOTING RESEARCH

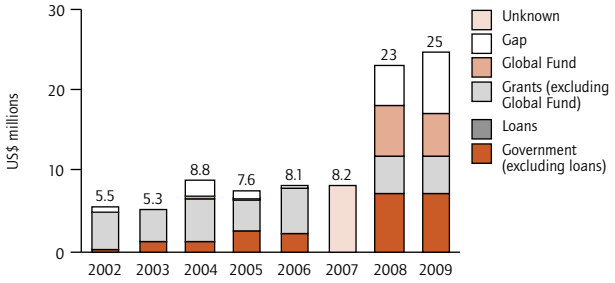
Programme-based operational research, 2007

Operational research budget (% of NTP budget)	–

FINANCING

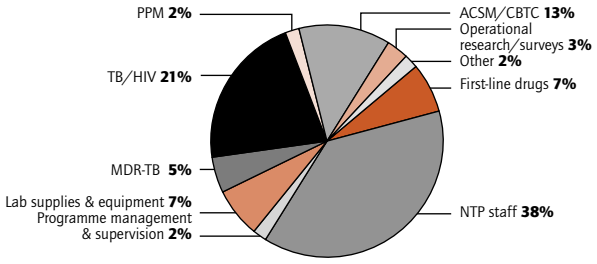
a. NTP budget by source of funding

Increased NTP budget since 2008 reflects new plan for TB control and re-assessment of funding needs; increased funding from government and Global Fund since 2008



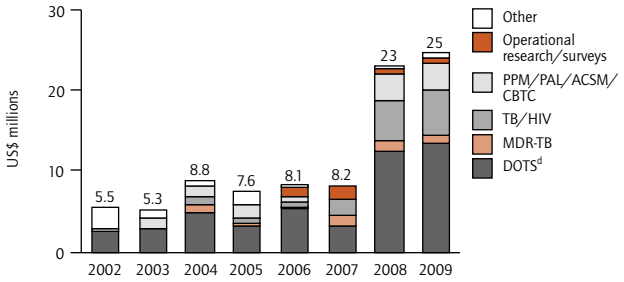
b. NTP budget line items in 2009

Largest component of the budget is NTP staff, unlike other African HBCs, followed by TB/HIV



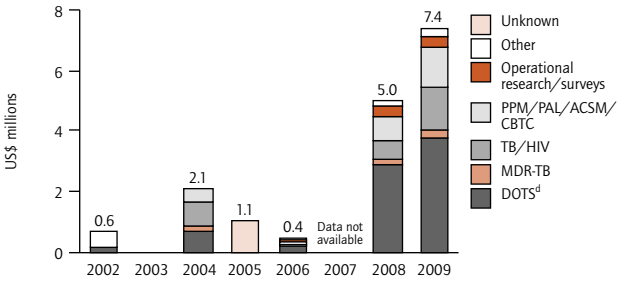
c. NTP budget by line item

Budget for all major components of TB control increased in 2008, notably for DOTS, TB/HIV and ACSM



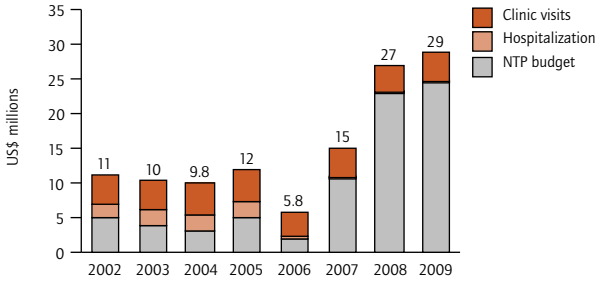
d. NTP funding gap by line item

Funding gap within DOTS mainly for first-line drugs and dedicated NTP staff



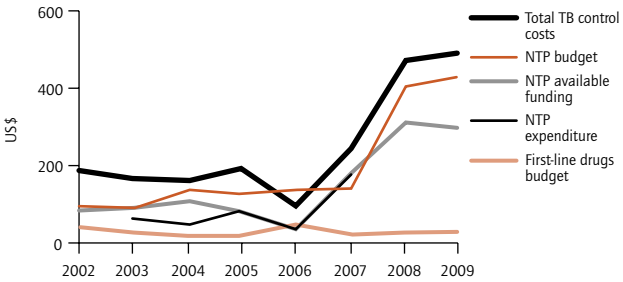
e. Total TB control costs by line item[1]

Cost of hospitalization based on 1900 TB dedicated beds (2002–2005) and 7% of new TB patients hospitalized for 14 days (2006–2009)



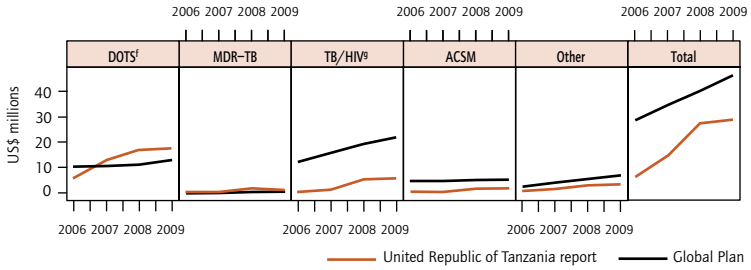
f. Per patient costs, budgets and expenditures[2]

Increasing expenditure, budget and total cost per patient since 2006



g. Global Plan compared with country reports[e]

Country assessment of funding requirements 2006–2007 less than Global Plan, and focused on DOTS; greater similarity with Global Plan 2008–2009, except for TB/HIV, which may reflect funding and implementation of activities by national AIDS control programme as well as NTP



h. NTP budget and funding gap by Stop TB Strategy component (US$ millions)

	2009 BUDGET	GAP
DOTS expansion and enhancement	13	3.8
TB/HIV, MDR-TB and other challenges	6.6	1.7
Health system strengthening	0	0
Engage all care providers	0.4	0.03
People with TB, and communities	3.1	1.3
Research and surveys	0.7	0.4
Other	0.4	0.3

SOURCES, METHODS AND ABBREVIATIONS

[a–g] Please see footnotes page 169.

[1] Total TB control costs for 2002 are based on available funding, whereas those for 2003–2007 are based on expenditure, and those for 2008–2009 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

[2] NTP available funding for 2004–2007 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003 and 2008–2009 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.

– indicates not available or not applicable; pop, population; ss+, sputum smear-positive; ss–, sputum smear-negative pulmonary; unk, pulmonary – sputum smear not done or result unknown.

Viet Nam

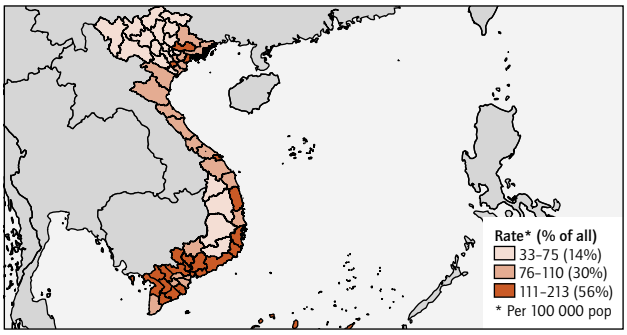
The preliminary results of the 2007 national survey of the prevalence of TB disease indicate that prevalence is higher than previously estimated. Although estimating TB incidence from the prevalence of TB disease is not straightforward, the survey also suggests that TB incidence may be higher, and the case detection rate lower, than previously estimated. Survey findings have prompted the NTP to accelerate implementation of PPM, ACSM and other components of the Stop TB Strategy, especially among population groups that have difficulty in accessing health-care services.

SURVEILLANCE AND EPIDEMIOLOGY

Population (thousands)[a] 87 375

Estimates of epidemiological burden, 2007[b]	ALL	IN HIV+ PEOPLE
Incidence		
All forms of TB (thousands of new cases per year)	150	12
All forms of TB (new cases per 100 000 pop/year)	171	14
Rate of change in incidence rate (%), 2006–2007	**–1.0**	**1.8**
New ss+ cases (thousands of new cases per year)	66	4.2
New ss+ cases (per 100 000 pop/year)	76	4.8
HIV+ incident TB cases (% of all TB cases)	8.1	–
Prevalence		
All forms of TB (thousands of cases)	192	6.0
All forms of TB (cases per 100 000 pop)	**220**	6.9
2015 target for prevalence (cases per 100 000 pop)	**182**	–
Mortality		
All forms of TB (thousands of deaths per year)	21	3.1
All forms of TB (deaths per 100 000 pop/year)	**24**	3.5
2015 target for mortality (deaths per 100 000 pop/year)	**16**	–
Multidrug-resistant TB (MDR-TB)		
MDR-TB among all new TB cases (%)	2.7	–
MDR-TB among previously treated TB cases (%)	19	–

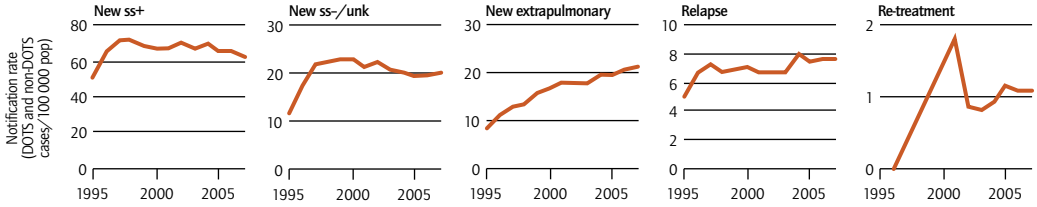
TB notification rate (new and relapse), 2007



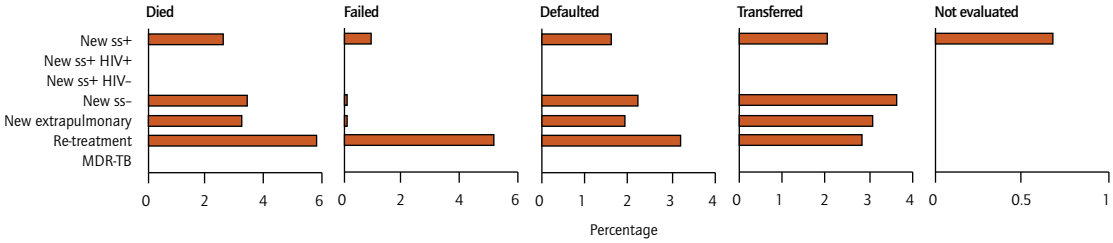
Total notifications, 2007

Notified new and relapse cases (thousands)	97
Notified new and relapse cases (per 100 000 pop/year)	111
Notified new ss+ cases (thousands)	54
Notified new ss+ cases (per 100 000 pop/year)	62
as % of new pulmonary cases	76
sex ratio (male/female)	2.8
DOTS case detection rate (% of estimated new ss+)	**82**
Notified new extrapulmonary cases (thousands)	19
as % of notified new cases	21
Notified new ss+ cases in children (<15 years) (thousands)	0.1
as % of notified new ss+ cases	0.2

Case notifications



Unfavourable treatment outcomes, 2006 cohorts



	2000	2001	2002	2003	2004	2005	2006	2007
DOTS coverage (%)	100	100	100	100	100	100	100	100
Notification rate (new & relapse cases/100 000 pop)	114	113	117	112	117	112	113	111
% notified new & relapse cases reported under DOTS	100	100	100	100	100	100	100	100
Notification rate (new ss+ cases/100 000 pop)	67	68	70	68	70	65	65	62
% notified new ss+ cases reported under DOTS	100	100	100	100	100	100	100	100
Case detection rate (all new cases, %)	58	59	61	59	62	60	61	61
Case detection rate (new ss+ cases, %)	82	84	87	86	89	84	86	82
Treatment success (new ss+ patients, %)	92	93	92	92	93	92	92	–
Re-treatment success (ss+ patients, %)	79	85	85	85	84	83	83	–

Note: notification, case detection and treatment success rates are for the whole country (i.e. DOTS and non-DOTS cases combined).

DOTS EXPANSION AND ENHANCEMENT

Overview of services for diagnosis of TB and treatment of patients

Description of basic management unit	District TB unit
Number of units (DOTS/total), 2007	680/680
Location of NTP services	
Rural Commune health post	
Urban –	
NTP services part of general primary health-care network?	Yes
Location where TB diagnosed	
Rural District TB unit	
Urban –	
Diagnosis free of charge?	Yes (all suspects)
Treatment supervised?	All patients in all units
Intensive phase	Health-care worker
Continuation phase	Health-care worker
Category I regimen	–
Treatment free of charge	–
External review missions	last: 2006
	next: 2011

Political commitment

National strategic plan?	Yes (2007–2011)
Mechanism for national interagency coordination?	Yes (established 2008)
National Stop TB Partnership?	Yes (established 2008)

Financial indicators, 2009

(see final page for detailed presentation)	%
Government contribution to NTP budget (incl loans)	39
Government contribution to total cost TB control (incl loans)	69
Government health spending used for TB control	3.3
NTP budget funded	100

Per capita health financial indicators, 2009

	US$
NTP budget per capita	0.1
Total costs for TB control per capita	0.3
Funding gap per capita	0
Government health expenditure per capita (2005)	9.6
Total health expenditure per capita (2005)	38

Quality-assured bacteriology

National reference laboratory?	Yes

All TB laboratories performing EQA of smear microscopy or DST under the supervision of the National Reference Laboratory

	Smear				Culture		DST			
	Number	per 100 000	EQA	% adeq perf	Number	per 5 000 000	Number	per 10 000 000	EQA	% adeq perf
2007	737	0.8	–	–	17	1.0	2	0.2	2.0	–
2008	–	–	–	–	30	1.7	–	–	–	–

Note: for routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extra-pulmonary and ss–/HIV+ TB, as well as DST of re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population. EQA column shows number of laboratories for which EQA was done. Adeq perf; adequate performance for microscopy based on results of EQA.

System for managing drug supplies and laboratory equipment

	Central level			Peripheral level		
	2005	2006	2007	2005	2006	2007
Stock-outs of laboratory supplies?	–	No	Yes	–	No	–
Stock-outs of first-line anti-TB drugs?	Yes	No	–	No	No	Yes

Monitoring and evaluation system, and impact measurement

NTP publishes annual report?	–
% of BMUs reporting to next level in 2007	
Case-finding	–
Treatment outcomes	–

Burden and impact assessment		last	next
In-depth analysis of routine surveillance data	–	–	–
Prevalence of disease survey	Yes	2007	–
Prevalence of infection survey	–	–	–
Drug resistance survey	Yes, national	2006	–
Mortality survey	–	–	–
Analysis of vital registration data	–	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES

Multidrug-resistant TB (MDR-TB)

	2005	2006	2007
	Number (% of estimated ss+ MDR-TB)		
Estimated incidence of ss+ MDR cases	4 170	4 185	4 199
Diagnosed and notified	– (–%)	– (–%)	– (–%)
Registered for treatment	– (–%)	– (–%)	– (–%)
GLC	0	0	0
non-GLC	–	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES (*continued*)

Detection and treatment of HIV in TB patients, 2007

TB patients for whom the HIV test result was known	14 377
as % of all notified TB patients	15
TB patients with positive HIV test	627
as % of all estimated HIV+ TB cases	5.2
HIV+ TB patients started or continued on CPT	–
as % of HIV+ TB patients notified	–
HIV+ TB patients started or continued on ART	–
as % of HIV+ TB patients notified	–

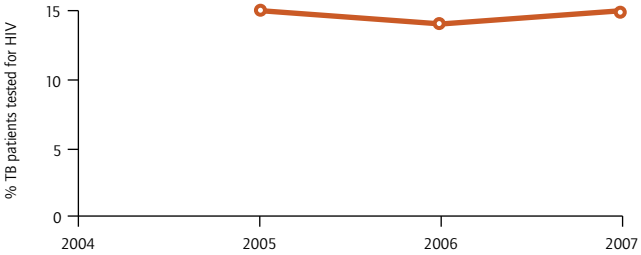
Screening for TB in HIV-positive patients, 2007

HIV+ patients in HIV care or ART register	–
Screened for TB	–
as % of HIV+ patients in HIV care or ART register	–
Started on TB treatment	–
as % of HIV+ patients in HIV care or ART register	–
Started on IPT	–
as % of HIV+ patients without TB in HIV care or ART register	–

High-risk groups, 2007

Number of close contacts of ss+ TB patients screened	–
Number of TB cases identified among contacts	–
% of contacts with TB	–
Contacts started on IPT	–
% of contacts without TB on IPT	–

HIV testing for TB patients



CPT and ART for HIV-positive TB patients

Data not reported

CONTRIBUTING TO HEALTH SYSTEM STRENGTHENING

The NTP is integrated into a relatively strong primary health-care system. However, reforms aimed at decentralizing and separating disease-specific control programmes from clinical services are ongoing and may affect the NTP, which is working to ensure effective services for referring patients and exchange of information where separation is anticipated. A further challenge, the large private health care sector throughout the country where first-line and second-line anti-TB drugs are often used irrationally, is being addressed by the NTP through scale-up of PPM.

Practical Approach to Lung Health (PAL), 2007

Number of health-care facilities providing PAL services	–	As % of total number of health-care facilities	–

ENGAGING ALL CARE PROVIDERS

Public-public and public-private approaches (PPM), 2007

Number of providers collaborating with the NTP[c]

	Number collaborating (total number of providers)	% total notified TB Diagnosed	Treated
Public sector	42 (–)	3.2	4.6
Private sector	– (–)	–	–

International Standards for Tuberculosis Care (ISTC)

ISTC endorsed by professional organizations?	–
By which organizations:	–
ISTC included in medical curriculum?	–

EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

Advocacy, communication and social mobilization (ACSM)

A KAP survey is planned for 2008. On World TB Day, all provinces hold meetings to raise awareness of TB at community level, and TB is featured in radio and television programmes. Advocacy meetings for managers in the health sector have been organized in 8 provinces. Advocacy meetings for political leaders have also been organized in 8 regions (which cover 60/64 provinces), one outcome of which was a letter to the Ministry of Health requesting greater support for provincial efforts in TB control, including support for recruitment and retention of adequately-qualified staff.

Community participation in TB care and Patients' Charter

Community involvement in TB control is in place in hard-to-reach areas as part of the primary health-care package. The project is currently being geographically expanded to cover all hard-to-reach areas in the country. Community-based care is also provided by voluntary treatment supporters in many areas. No data on use of the Patients' Charter were reported in 2008.

ENABLING AND PROMOTING RESEARCH

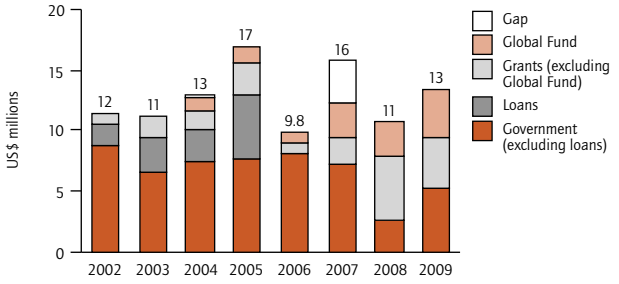
Programme-based operational research, 2007

Operational research budget (% of NTP budget)	0.6%

FINANCING

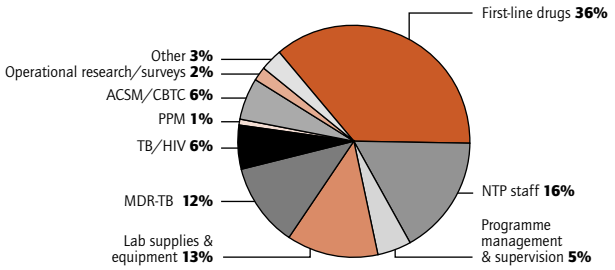
a. NTP budget by source of funding

Decreased funding from the government in 2008–2009, compensated for by increased funding from donors



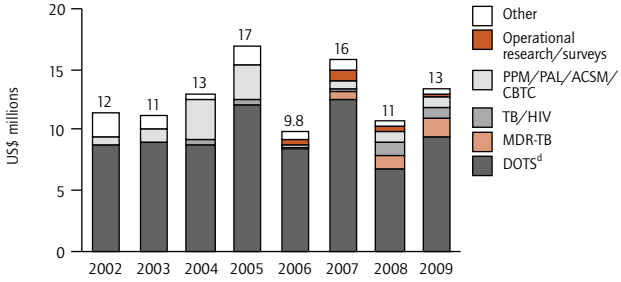
b. NTP budget line items in 2009

Largest component of budget is for DOTS (71%), followed by MDR-TB



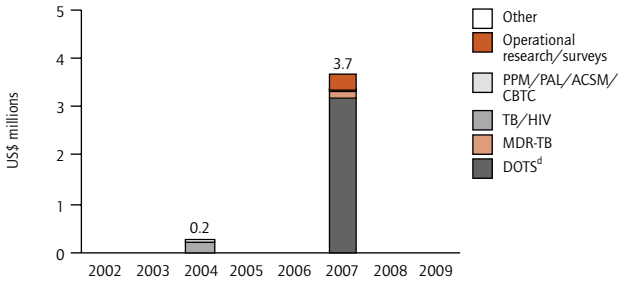
c. NTP budget by line item

Increased budget for MDR-TB in 2008 and 2009; within DOTS decreased budget for NTP staff and programme management



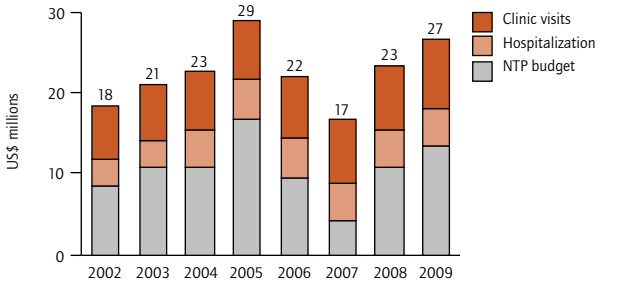
d. NTP funding gap by line item

No funding gap was reported for 2008–2009



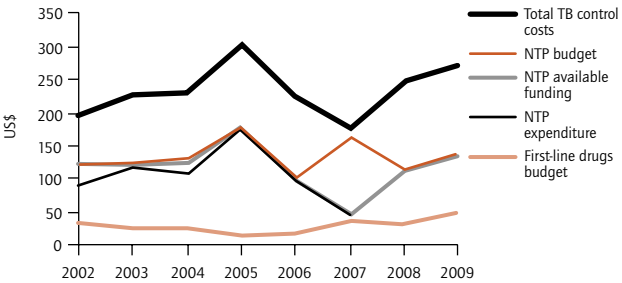
e. Total TB control costs by line item[1]

Cost of clinic visits based on 66 visits per TB patient; hospitalization costs based on estimate that there are 6481 TB beds



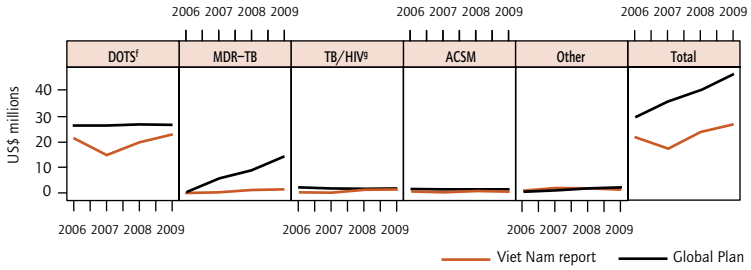
f. Per patient costs, budgets and expenditures[2]

Expenditure comparatively low in 2007; Fluctuation in all indicators



g. Global Plan compared with country reports[e]

Targets for MDR-TB patients to be treated in Global MDR/XDR-TB Response Plan much higher than scaling-up planned by NTP



h. NTP budget and funding gap by Stop TB Strategy component (US$ millions)

	2009 BUDGET	GAP
DOTS expansion and enhancement	9.5	0
TB/HIV, MDR-TB and other challenges	2.3	0
Health system strengthening	0	0
Engage all care providers	0.1	0
People with TB, and communities	0.8	0
Research and surveys	0.3	0
Other	0.4	0

SOURCES, METHODS AND ABBREVIATIONS

[a–g] Please see footnotes page 169.

[1] Total TB control costs for 2002–2007 are based on expenditure, whereas those for 2008–2009 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

[2] NTP available funding for 2004–2007 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003 and 2008–2009 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.

– indicates not available or not applicable; pop, population; ss+, sputum smear-positive; ss–, sputum smear-negative pulmonary; unk, pulmonary – sputum smear not done or result unknown.

Zimbabwe

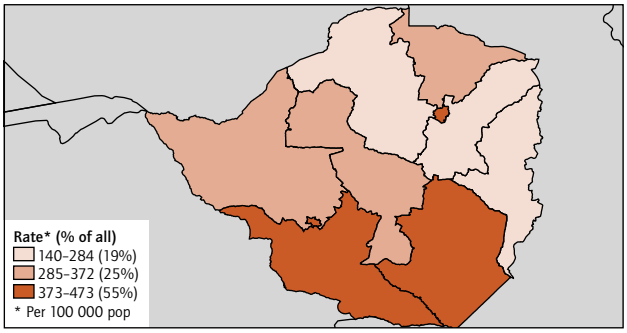
The TB control programme has been adversely affected by a lack of adequate financial, human and material resources. The recording and reporting system is unable to provide reliable data on DOTS implementation, collaborative TB/HIV activities or MDR-TB management. Funding from round 5 of the Global Fund grant and the successful round 8 Global Fund application should help revive basic TB control in the country. However, without a functional health-care system, progress is likely to be slow.

SURVEILLANCE AND EPIDEMIOLOGY

Population (thousands)[a] 13 349

Estimates of epidemiological burden, 2007[b]	ALL	IN HIV+ PEOPLE
Incidence		
All forms of TB (thousands of new cases per year)	104	72
All forms of TB (new cases per 100 000 pop/year)	782	539
Rate of change in incidence rate (%), 2006–2007	**–2.6**	**–5.5**
New ss+ cases (thousands of new cases per year)	40	25
New ss+ cases (per 100 000 pop/year)	298	189
HIV+ incident TB cases (% of all TB cases)	69	–
Prevalence		
All forms of TB (thousands of cases)	95	36
All forms of TB (cases per 100 000 pop)	**714**	270
2015 target for prevalence (cases per 100 000 pop)	**205**	–
Mortality		
All forms of TB (thousands of deaths per year)	35	28
All forms of TB (deaths per 100 000 pop/year)	**265**	213
2015 target for mortality (deaths per 100 000 pop/year)	**70**	–
Multidrug-resistant TB (MDR-TB)		
MDR-TB among all new TB cases (%)	1.9	–
MDR-TB among previously treated TB cases (%)	8.3	–

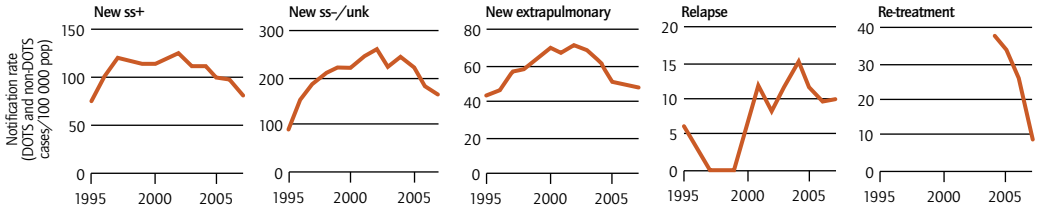
TB notification rate (new and relapse), 2007



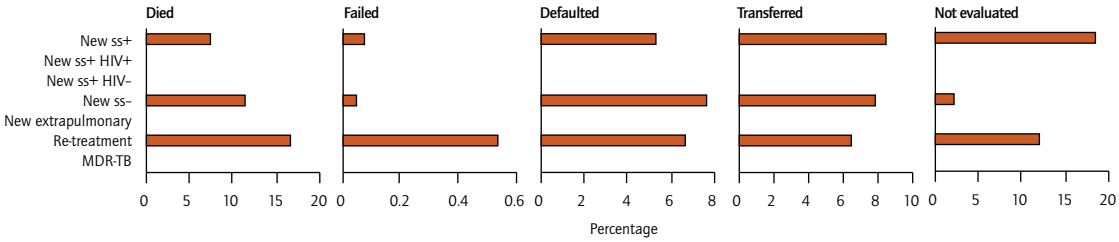
Total notifications, 2007

Notified new and relapse cases (thousands)	40
Notified new and relapse cases (per 100 000 pop/year)	302
Notified new ss+ cases (thousands)	11
Notified new ss+ cases (per 100 000 pop/year)	79
as % of new pulmonary cases	33
sex ratio (male/female)	1.1
DOTS case detection rate (% of estimated new ss+)	**27**
Notified new extrapulmonary cases (thousands)	6.4
as % of notified new cases	16
Notified new ss+ cases in children (<15 years) (thousands)	0.3
as % of notified new ss+ cases	3.1

Case notifications



Unfavourable treatment outcomes, 2006 cohorts



	2000	2001	2002	2003	2004	2005	2006	2007
DOTS coverage (%)	100	100	100	100	100	100	100	100
Notification rate (new & relapse cases/100 000 pop)	402	440	460	411	431	385	335	302
% notified new & relapse cases reported under DOTS	100	100	100	100	100	100	100	100
Notification rate (new ss+ cases/100 000 pop)	114	120	124	112	112	100	96	79
% notified new ss+ cases reported under DOTS	100	100	100	100	100	100	100	100
Case detection rate (all new cases, %)	59	58	57	48	50	45	41	37
Case detection rate (new ss+ cases, %)	45	44	42	36	36	32	32	27
Treatment success (new ss+ patients, %)	69	71	67	66	54	68	60	–
Re-treatment success (ss+ patients, %)	–	61	63	54	53	60	57	–

Note: notification, case detection and treatment success rates are for the whole country (i.e. DOTS and non-DOTS cases combined).

DOTS EXPANSION AND ENHANCEMENT

Overview of services for diagnosis of TB and treatment of patients

Description of basic management unit	Hospital
Number of units (DOTS/total), 2007	64/64
Location of NTP services	
Rural Rural health centre	
Urban Urban clinic	
NTP services part of general primary health-care network?	Yes
Location where TB diagnosed	
Rural District hospital	
Urban Hospital	
Diagnosis free of charge?	Yes (all suspects)
Treatment supervised?	All patients in some units
Intensive phase	–
Continuation phase	–
Category I regimen	2(HRZE)/4(HR)
Treatment free of charge	All patients in all units
External review missions	last: 2008
	next: –

Political commitment

National strategic plan?	Yes (2006–2010)
Mechanism for national interagency coordination?	Yes (established 2008)
National Stop TB Partnership?	No (planned 2009)

Financial indicators, 2009

(see final page for detailed presentation)	%
Government contribution to NTP budget (incl loans)	3.7
Government contribution to total cost TB control (incl loans)	22
Government health spending used for TB control	18
NTP budget funded	46

Per capita health financial indicators, 2009

	US$
NTP budget per capita	1.3
Total costs for TB control per capita	1.6
Funding gap per capita	0.7
Government health expenditure per capita (2005)	9.2
Total health expenditure per capita (2005)	21

Quality-assured bacteriology

National reference laboratory?	Yes

All TB laboratories performing EQA of smear microscopy or DST under the supervision of the National Reference Laboratory

	Smear				Culture		DST			
	Number	per 100 000	EQA	% adeq perf	Number	per 5 000 000	Number	per 10 000 000	EQA	% adeq perf
2007	180	1.3	0	–	1	0.4	1	0.7	0	–
2008	180	1.3	12	–	1	0.4	1	0.7	1.0	–

Note: for routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extra-pulmonary and ss–/HIV+ TB, as well as DST of re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population. EQA column shows number of laboratories for which EQA was done. Adeq perf; adequate performance for microscopy based on results of EQA.

System for managing drug supplies and laboratory equipment

	Central level			Peripheral level		
	2005	2006	2007	2005	2006	2007
Stock-outs of laboratory supplies?	–	No	Yes	–	Some units	Some units
Stock-outs of first-line anti-TB drugs?	Yes	Yes	Yes	Yes	Some units	Some units

Monitoring and evaluation system, and impact measurement

NTP publishes annual report?	Yes (since –)
% of BMUs reporting to next level in 2007	
Case-finding	98%
Treatment outcomes	98%

Burden and impact assessment		last	next
In-depth analysis of routine surveillance data	Yes	2007	2008
Prevalence of disease survey	No	–	2010
Prevalence of infection survey	No	–	–
Drug resistance survey	Yes, sub-national	1995	–
Mortality survey	No	–	–
Analysis of vital registration data	Yes	2007	2008

MDR-TB, TB/HIV AND OTHER CHALLENGES

Multidrug-resistant TB (MDR-TB)

	2005	2006	2007
	Number (% of estimated ss+ MDR-TB)		
Estimated incidence of ss+ MDR cases	1 669	1 644	1 620
Diagnosed and notified	– (–%)	– (–%)	– (–%)
Registered for treatment	– (–%)	– (–%)	– (–%)
GLC	0	0	0
non-GLC	–	–	–

MDR-TB, TB/HIV AND OTHER CHALLENGES (*continued*)

Detection and treatment of HIV in TB patients, 2007

TB patients for whom the HIV test result was known	5 252
as % of all notified TB patients	13
TB patients with positive HIV test	4 373
as % of all estimated HIV+ TB cases	6.1
HIV+ TB patients started or continued on CPT	4 373
as % of HIV+ TB patients notified	100
HIV+ TB patients started or continued on ART	–
as % of HIV+ TB patients notified	–

Screening for TB in HIV-positive patients, 2007

HIV+ patients in HIV care or ART register	142 057
Screened for TB	–
as % of HIV+ patients in HIV care or ART register	–
Started on TB treatment	–
as % of HIV+ patients in HIV care or ART register	–
Started on IPT	–
as % of HIV+ patients without TB in HIV care or ART register	–

High-risk groups, 2007

Number of close contacts of ss+ TB patients screened	–
Number of TB cases identified among contacts	–
% of contacts with TB	–
Contacts started on IPT	–
% of contacts without TB on IPT	–

HIV testing for TB patients

2007 is the first year for which data are available on HIV testing among TB patients

CPT and ART for HIV-positive TB patients

Data on the provision of ART to HIV-positive TB patients are not available; all HIV-positive TB patients receive CPT

CONTRIBUTING TO HEALTH SYSTEM STRENGTHENING

Since they were first introduced, activities to control TB have been fully integrated within primary health-care services. The roles and responsibilities of different levels of the health system are clearly defined for TB control. The main health system challenges are shortages of adequately trained staff due to high turnover and emigration, insufficient access to and availability of laboratory diagnostic services (including reagents, materials and staff), and insufficient funding for supervision, monitoring and evaluation and training at all levels.

Practical Approach to Lung Health (PAL), 2007

Number of health-care facilities providing PAL services	0	As % of total number of health-care facilities	0

ENGAGING ALL CARE PROVIDERS

Public-public and public-private approaches (PPM), 2007

Number of providers collaborating with the NTP[c]

	Number collaborating (total number of providers)	% total notified TB Diagnosed	Treated
Public sector	– (–)	–	–
Private sector	– (–)	–	–

International Standards for Tuberculosis Care (ISTC)

ISTC endorsed by professional organizations?	No
ISTC included in medical curriculum?	No

EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

Advocacy, communication and social mobilization (ACSM)

In 2008, the main ACSM activity was commemoration of World TB Day. This included events attended by the Minister of Health and several MPs, and broadcasting of three radio programmes that featured TB.

Community participation in TB care and Patients' Charter

There are ongoing efforts to improve the quality and scope of community-based activities, both to ensure the quality of care and to increase the demand for services to control TB.

ENABLING AND PROMOTING RESEARCH

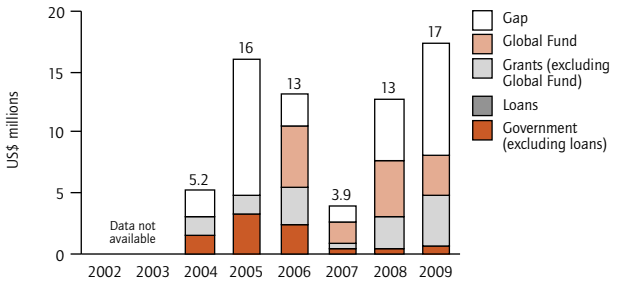
Programme-based operational research, 2007

Operational research budget (% of NTP budget)	3.3%

FINANCING

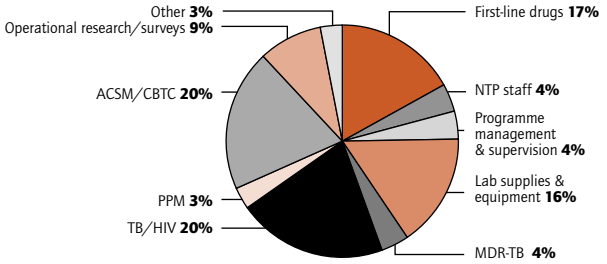
a. NTP budget by source of funding

Increased budget in 2009 with increased funding from external donors other than the Global Fund; large funding gap remains



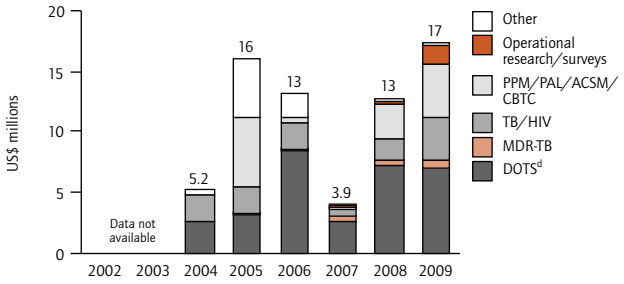
b. NTP budget line items in 2009

DOTS implementation accounts for the highest share of the budget, followed by ACSM; operational research includes surveys of MDR/XDR and HIV among TB patients



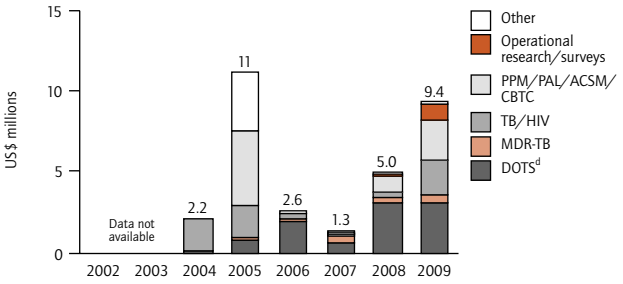
c. NTP budget by line item

Within DOTS, increased budget for laboratory is primarily to equip the second culture and DST laboratory in the capital city



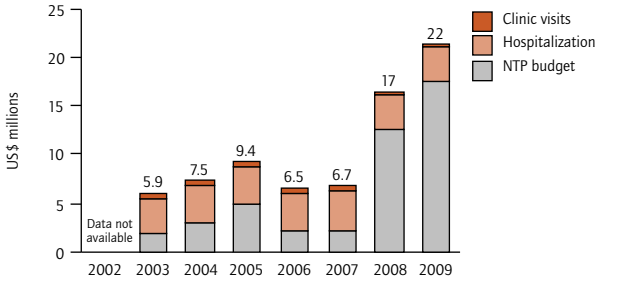
d. NTP funding gap by line item

Funding gap within DOTS mainly for laboratory supplies and equipment



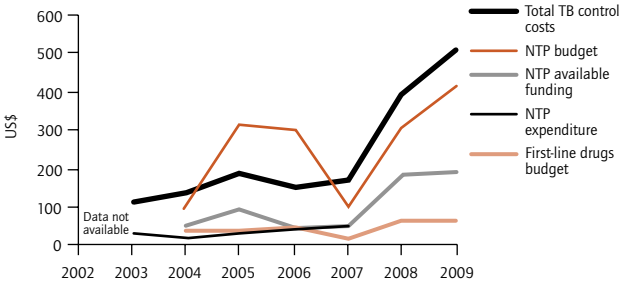
e. Total TB control costs by line item[1]

Hospitalization based on estimates that 85% of new ss+ patients and 55% of new ss–/extrapulmonary patients are hospitalized for 14 and 21 days respectively



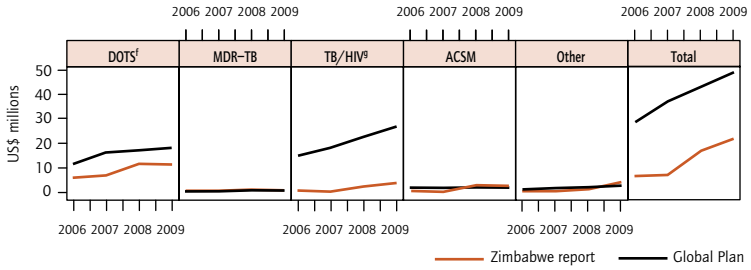
f. Per patient costs, budgets and expenditures[2]

Increasing cost, budget and available funding per patient from 2007



g. Global Plan compared with country reports[e]

Country implementation of TB control activities 2006–2007 focused on DOTS only; country plan for 2008–2009 incorporates other elements of Stop TB Strategy; biggest difference with Global Plan is in estimated funding requirements for TB/HIV



h. NTP budget and funding gap by Stop TB Strategy component (US$ millions)

	2009 BUDGET	GAP
DOTS expansion and enhancement	7.0	3.0
TB/HIV, MDR-TB and other challenges	4.3	2.7
Health system strengthening	0.3	0.2
Engage all care providers	0.6	0.6
People with TB, and communities	3.5	1.6
Research and surveys	1.6	1.1
Other	0.3	0.1

SOURCES, METHODS AND ABBREVIATIONS

[a–g] Please see footnotes page 169.

[1] Total TB control costs for 2003 and 2006–2007 are based on expenditure, whereas those for 2004–2005 are based on available funding, and those for 2008–2009 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

[2] NTP available funding for 2006–2007 is based on the amount of funding actually received, using retrospective data; available funding for 2004–2005 and 2008–2009 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.

– indicates not available or not applicable; pop, population; ss+, sputum smear-positive; ss–, sputum smear-negative pulmonary; unk, pulmonary – sputum smear not done or result unknown.

Footnotes

[a] *World population prospects – the 2006 revision.* New York, United Nations Population Division, 2007.

[b] For data sources and analytical methods, see Annexes 2 and 3.

[c] For a definition of public and private sector and the categories of provider considered in each case, see Chapter 2 and the 2008 WHO TB data collection form.

[d] DOTS includes the following components: first-line drugs, NTP staff, programme management and supervision, and laboratory supplies and equipment.

[e] Estimates in the Global Plan were presented at regional rather than country level. See Methods for explanation of calculation of individual country estimates from regional estimates. Other includes budget for PPM, PAL, operational research, surveys and other.

[f] DOTS includes the cost of clinic visits and hospitalization.

[g] Global Plan estimates cover the full costs of collaborative TB/HIV activities, but these costs may be budgeted for by either the NTP or the National AIDS Control Programme. In this graph, country reports include only the NTP budget. This may explain the apparent discrepancy between the Global Plan and country reports.

ANNEX 2

Methods

A.2.1 Data collection and verification – an overview

Every year since 1995, WHO has requested information about TB control from all countries and territories via a standard data collection form that is sent to NTPs or other relevant public health authorities.[1] The latest form, which was identical for all countries,[2] was distributed in mid-2008. It had three major components: case notifications and treatment outcomes; data related to implementation of the Stop TB Strategy; and financing. Forms returned to WHO are systematically reviewed by staff in country and regional offices and at headquarters. An acknowledgement message that includes follow-up questions if appropriate (for example if some data are missing or if responses appear inconsistent with those from previous years) is sent back to the NTP correspondent (or equivalent) and used as the basis for producing a final dataset. In the WHO European Region only, data collection and verification are undertaken jointly by the WHO regional office and the European Centre for Disease Prevention and Control (ECDC).

Finalized data are used to compile country profiles (such as those that appear in ANNEX 1) as well as the summary analyses that appear in CHAPTERS 1–3 and the regional and country-specific data presented in ANNEX 3 and ANNEX 4. Regional analyses are generally undertaken for the six WHO regions (that is, the African Region, the Region of the Americas, the Eastern Mediterranean Region, the European Region, the South-East Asia Region and the Western Pacific Region). For analyses of epidemiological trends at the regional level, the African Region is divided into countries with low and high rates of HIV infection (with "high" defined as an infection rate of ≥4% in adults aged 15–49 years in 2004, as estimated by UNAIDS); central and eastern Europe (countries of the former Soviet states plus Bulgaria and Romania) are also distinguished; and countries in western Europe are analysed together with other high-income countries.[3] The countries within each of the resulting nine subregions are:

Africa – countries with high HIV prevalence: Botswana, Burkina Faso, Burundi, Cameroon, the Central African Republic, Chad, the Congo, Côte d'Ivoire, the Democratic Republic of the Congo, Equatorial Guinea, Ethiopia, Gabon, Kenya, Lesotho, Liberia, Malawi, Mozambique, Namibia, Nigeria, Rwanda, South Africa, Swaziland, Uganda, the United Republic of Tanzania, Zambia, Zimbabwe.

Africa – countries with low HIV prevalence: Algeria, Angola, Benin, Cape Verde, the Comoros, Eritrea, the Gambia, Ghana, Guinea, Guinea-Bissau, Madagascar, Mali, Mauritania, Mauritius, the Niger, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Togo.

Central Europe: Albania, Bosnia and Herzegovina, Croatia, Hungary, Montenegro, Poland, Serbia, Slovakia, the former Yugoslav Republic of Macedonia, Turkey.

Eastern Europe: Armenia, Azerbaijan, Belarus, Bulgaria, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, the Republic of Moldova, Romania, the Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan.

Eastern Mediterranean: Afghanistan, Djibouti, Egypt, the Islamic Republic of Iran, Iraq, Jordan, Lebanon, the Libyan Arab Jamahiriya, Morocco, Oman, Pakistan, Somalia, the Sudan, the Syrian Arab Republic, Tunisia, the West Bank and Gaza Strip, Yemen.

High-income countries: Andorra, Antigua and Barbuda, Australia, Austria, the Bahamas, Bahrain, Barbados, Belgium, Bermuda, the British Virgin Islands, Brunei Darussalam, Canada, the Cayman Islands, China Hong Kong Special Administrative Region, China Macao Special Administrative Region, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, French Polynesia, Germany, Greece, Guam, Iceland, Ireland, Israel, Italy, Japan, Kuwait, Luxembourg, Malta, Monaco, the Netherlands, the Netherlands Antilles, New Caledonia, New Zealand, Norway, Portugal, Puerto Rico, Qatar, the Republic of Korea, San Marino, Saudi Arabia, Singapore, Slovenia, Spain, Sweden, Switzerland, Trinidad and Tobago, the Turks and Caicos Islands, the United Arab Emirates, the United Kingdom, the United States, the United States Virgin Islands.

Latin America: Anguilla, Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, the Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Montserrat, Nicaragua, Panama, Paraguay, Peru, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Uruguay, Venezuela.

South-East Asia: Bangladesh, Bhutan, the Democratic People's Republic of Korea, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand, Timor-Leste.

Western Pacific: American Samoa, Cambodia, China, Cook Islands, Fiji, Kiribati, the Lao People's Democratic Republic, Malaysia, the Marshall Islands, Micronesia, Mongolia, Nauru, Niue, the Northern Mariana Islands, Palau, Papua New Guinea, the Philippines, Samoa, Solomon Islands, Tokelau, Tonga, Vanuatu, Viet Nam, Wallis and Futuna.

Before publication, country profiles are reviewed by NTPs; ANNEX 1 and ANNEX 3 are also reviewed by regional and country offices.

NTPs that respond to WHO are asked to update information for earlier years where possible. As a result, the data (case notifications, treatment outcomes, etc.) presented in this report may differ from those published in previous reports.

The annual data collection form used by WHO is designed for collection of aggregated national data. It is not recom-

[1] Posted at http://www.who.int/entity/tb/publications/global_report/2009.

[2] In previous years, separate questionnaires were sent to HBCs and other countries, and questions related to TB/HIV were more detailed for a set of global priority countries.

[3] As defined by the World Bank. High-income countries are those with a per capita gross national income (GNI) of US$ 11 116 or more.

TABLE A2.1
Definitions of tuberculosis cases and treatment outcomes

A. DEFINITIONS OF TUBERCULOSIS CASES

CASE OF TUBERCULOSIS A patient in whom tuberculosis has been confirmed by bacteriology or diagnosed by a clinician.

DEFINITE CASE A patient with positive culture for the Mycobacterium tuberculosis complex. In countries where culture is not routinely available, a patient with one sputum smear positive for acid-fast bacilli (AFB+) is also considered a definite case.

PULMONARY CASE A patient with tuberculosis disease involving the lung parenchyma.

SMEAR-POSITIVE PULMONARY CASE A patient with one or more initial sputum smear examinations (direct smear microscopy) AFB+.

SMEAR-NEGATIVE PULMONARY CASE A patient with pulmonary tuberculosis not meeting the above criteria for smear-positive disease. Diagnostic criteria should include: at least two sputum smear examinations negative for AFB; and radiographic abnormalities consistent with active pulmonary tuberculosis; and no response to a course of broad-spectrum antibiotics (except in a patient for whom there is laboratory confirmation or strong clinical evidence of HIV infection); and a decision by a clinician to treat with a full course of antituberculosis chemotherapy; or positive culture but negative AFB sputum examinations.

EXTRAPULMONARY CASE A patient with tuberculosis of organs other than the lungs (e.g. pleura, lymph nodes, abdomen, genitourinary tract, skin, joints and bones, meninges). Diagnosis should be based on one culture-positive specimen, or histological or strong clinical evidence consistent with active extrapulmonary disease, followed by a decision by a clinician to treat with a full course of antituberculosis chemotherapy. A patient in whom both pulmonary and extrapulmonary tuberculosis has been diagnosed should be classified as a pulmonary case.

NEW CASE A patient who has never had treatment for tuberculosis or who has taken antituberculosis drugs for less than one month.

RE-TREATMENT CASE A patient previously treated for TB, who is started on a re-treatment regimen after previous treatment has failed (treatment after failure), who returns to treatment having previously defaulted (see below; treatment after default), or who was previously declared cured or treatment completed and is diagnosed with bacteriologically positive (sputum smear or culture) TB (relapse).

B. DEFINITIONS OF TREATMENT OUTCOMES
(expressed as a percentage of the number registered in the cohort)

CURED A patient who was initially smear-positive and who was smear-negative in the last month of treatment and on at least one previous occasion.

COMPLETED TREATMENT A patient who completed treatment but did not meet the criteria for cure or failure. This definition applies to pulmonary smear-positive and smear-negative patients and to patients with extrapulmonary disease.

DIED A patient who died from any cause during treatment.

FAILED A patient who was initially smear-positive and who remained smear-positive at month 5 or later during treatment.

DEFAULTED A patient whose treatment was interrupted for 2 consecutive months or more.

TRANSFERRED OUT A patient who transferred to another reporting unit and for whom the treatment outcome is not known.

SUCCESSFULLY TREATED A patient who was cured or who completed treatment.

COHORT A group of patients in whom TB has been diagnosed, and who were registered for treatment during a specified time period (e.g. the cohort of new smear-positive cases registered in the calendar year 2005). This group forms the denominator for calculating treatment outcomes. The sum of the above treatment outcomes, plus any cases for whom no outcome is recorded (e.g. "still on treatment" in the European Region) should equal the number of cases registered. Some countries monitor outcomes among cohorts defined by smear and/or culture, and define cure and failure according to the best laboratory evidence available for each patient.

mended for collection of data within countries. Recommendations about recording and reporting of data within countries, starting from the lowest administrative level, are available in other WHO publications.[1]

A2.2 Epidemiology and surveillance

A2.2.1 Data collected

The section of the data collection form on epidemiology and surveillance requested data about TB case notifications in 2007, HIV testing for TB patients in 2007, testing of TB patients for MDR-TB in 2007, treatment outcomes for TB patients registered during 2006, and treatment outcomes for MDR-TB patients registered in 2004, 2005 and 2006 (with final outcomes requested for the 2004 cohort and interim outcomes requested for the 2005 and 2006 cohorts). The main case definitions are given in TABLE A2.1.

The data collection form used in the WHO European Region asked for additional data, including a breakdown of all TB cases by age, sex, HIV status and geographical origin (for example, patients born outside the country or non-citizens). Data on case notifications classified according to diagnosis based on culture (as well as sputum smears) were also requested.

A2.2.2 Estimates of TB incidence, prevalence and mortality – general approach and data sources

Estimates of TB incidence, prevalence and mortality are based on a consultative and analytical process. They are revised annually to reflect new information gathered through surveillance (case notifications and death registrations) and from special studies (including surveys of the prevalence of disease and in-depth analysis of surveillance data). Full details about estimation methods are provided in publications in peer-reviewed journals.[2,3,4] In 2007, WHO also prepared a series of country-by-country explanations of these estimates (for each country, there is one Word file with a text explanation of the key methods, and one Excel file that sets out the data, assumptions and calculations), as well as a general overview of methods. These documents were designed to be accessible to those without expertise in epidemiology, and will be updated in 2009. The documents are available from WHO upon request.

Two more recent publications provide up-to-date guidance about how TB incidence, prevalence and mortality should

[1] WHO recommendations for recording and reporting are described at: http://www.who.int/tb/dots/r_and_r_forms/en/index.html
[2] Dye C et al. Global burden of tuberculosis: estimated incidence, prevalence and mortality by country. *Journal of the American Medical Association*, 1999, 282:677–686.
[3] Corbett EL et al. The growing burden of tuberculosis: global trends and interactions with the HIV epidemic. *Archives of Internal Medicine*, 2003, 163:1009–1021.
[4] Dye C et al. Evolution of tuberculosis control and prospects for reducing tuberculosis incidence, prevalence, and deaths globally. *Journal of the American Medical Association*, 2005, 293:2767–2775.

be measured[1,2] based on the work of the WHO Global Task Force on TB Impact Measurement. These documents can be read in conjunction with the list of countries where surveys of the prevalence of TB disease have been implemented or are planned in the near future (ANNEX 4), with the set of countries that now register deaths by cause of death and provide these data to WHO (ANNEX 4), and with existing or planned work on impact measurement as reported by the HBCs (ANNEX 1, see "Monitoring and evaluation, and impact measurement" sections of country profiles).

Where population sizes are needed to calculate TB indicators, we use the latest revision of estimates provided by the United Nations Population Division.[3] These estimates sometimes differ from those made by countries. Discrepancies in population estimates that make a difference to TB estimates published by WHO are explained in the country notes at the beginning of ANNEX 3.

Until 2008, most analyses were undertaken using Excel software. During 2008, a new system for producing estimates using R software[4] has been developed and run in parallel with analyses undertaken in Excel. Following checks that have verified that both systems produce the same results, full substitution of Excel with R will occur in 2009. Advantages of programming the calculations required to produce estimates of TB incidence, prevalence and mortality in R include enhanced reliability, efficiency, and transparency of methods and results. The software also provides much greater capacity to use Monte Carlo simulations to analyse the sensitivity of estimates to different parameters and to produce confidence intervals as well as point estimates.

A2.2.3 Estimates of TB incidence, 1990–2007

Estimates of the incidence of TB for each country are first made for a reference year using one of the four equations shown below. The reference year is the year for which a best estimate of incidence is available. For most countries (n=148) this is 1997, when a global consultation process was used to produce estimates of incidence for all countries. For an increasing number of countries, the reference year is more recent and is the year in which a survey of the prevalence of TB disease or a rigorous analysis of surveillance data was carried out.

$$\text{incidence} = \frac{\text{case notifications}}{\text{proportion of cases detected}} \qquad 1$$

$$\text{incidence} = \frac{\text{prevalence}}{\text{duration of condition}} \qquad 2$$

$$\text{incidence} = \text{annual risk of infection} \times \text{Stýblo coefficient} \qquad 3$$

$$\text{incidence} = \frac{\text{deaths}}{\text{proportion of incident cases that die}} \qquad 4$$

TABLE A.3.1 summarizes the number of countries for which each method is used.

The Stýblo coefficient (equation 3) has conventionally been assumed to be a constant, with an empirically derived value in the range 40–60. This coefficient relates the annual risk of infection (ARI) (% per year) to the incidence of sputum smear-positive cases (per 100 000 population per year). There is increasing evidence to suggest that the Stýblo coefficient is not constant[5] and that its value is difficult to predict.[6] For this reason, use of this method to estimate incidence is being phased out.

Once incidence has been estimated for a reference year, estimates of incidence for each country in surrounding years (back to 1990, forward to 2007) are made in one of five ways:

1. From country-specific time-series of case notifications, based on the assumption that the trend in incidence (of all forms of TB) is the same as the trend in notifications of all new and relapse TB cases.[7] Time-series of notifications are constructed in one of three ways. If the rate of change in case notifications has been roughly constant through time, exponential trends are fitted to the notification series. If the case notification rate has varied through time, the trend is estimated as a three-year moving average of the notification rate. For countries with a small population, a high estimated case detection rate and surveillance data of high quality, incidence is allowed to mirror annual changes in notifications (on the basis that such changes are stochastic and to avoid substantial year-to-year fluctuation in the case detection rate).

2. From regional time-series of case notifications that are constructed using data from a subset of countries in the region for which notification data are considered to be reliable, with the assumption that the trend in incidence (of all forms of TB) is the same as the regional trend in notifications of all new and relapse TB cases. This method is used for countries where case notifications are assessed to be an unreliable guide to trends in TB incidence (for example because the amount of effort invested in compiling and reporting data is known to have changed, or because reports are clearly erratic and changing in a way that cannot be attributed to real changes in the epidemiology of TB). The aggregated regional trend is based on fitting an exponential trend for the subregions of Africa

[1] Dye C. et al. Measuring tuberculosis burden, trends and the impact of control programmes. *Lancet Infectious Diseases* (published online 16 January 2008; http://infection.thelancet.com).
[2] Measuring progress in TB control: WHO policy and recommendations (policy paper). Geneva, World Health Organization, 2009 [in press].
[3] *World population prospects – the 2006 revision*. New York, United Nations Population Division, 2007.
[4] http://www.r-project.org
[5] Dye C. Breaking a law: tuberculosis disobeys Stýblo's rule. *Bulletin of the World Health Organization*, 2008, 86:4.
[6] van Leth F, Van der Werf MJ, Borgdorff MW. Prevalence of tuberculous infection and incidence of tuberculosis: a re-assessment of the Styblo rule. *Bulletin of the World Health Organization*, 2008, 86:20–26.
[7] The term "case notification", as used here, means that TB is diagnosed in a patient and is reported within the national surveillance system, and then to WHO.

low-HIV, Latin America, South-East Asia and the Western Pacific. The aggregated trend is based on a moving average for the subregions of Africa high-HIV, Central Europe, Eastern Europe, the Eastern Mediterranean and Established Market Economies.

3. From ARI data from tuberculin surveys. For a small and decreasing number of countries, trends in incidence are estimated from trends in the ARI, as measured in a series of tuberculin surveys.
4. From the assumption that TB incidence has been stable. For a few countries with no reliable data from which trends in incidence can be assessed (examples are Iraq and Pakistan, where data are hard to interpret and which are atypical within their own regions), the TB incidence rate per capita is assumed to have remained constant before and after the reference year.
5. From trends in TB mortality. For two countries (Brazil and South Africa), trends in incidence are estimated from trends in TB mortality, as measured from vital registration data.

Further details are available in the publications and other reference material cited in A2.2.2. TABLE A.3.1 in ANNEX 3 summarizes the number of countries for which each method is used.

A2.2.4 Estimates of the prevalence of HIV among incident cases of TB, 1990–2007

The prevalence of HIV among incident TB cases was directly estimated from country-specific and empirical data wherever possible. For the estimates published in this report, such data were available for 64 countries from either national surveys (7 countries), sentinel surveillance systems (8 countries) or provider-initiated HIV testing results of at least 50% of notified new cases (49 countries).

Before using results from routine HIV testing with no adjustment for the coverage of HIV testing, the relationship between estimates of the prevalence of HIV among TB patients and testing coverage was explored. This showed that there was no clear relationship between HIV prevalence and testing coverage (for example, that HIV prevalence fell as testing coverage increased). For this reason, no attempt was made to adjust estimates of HIV prevalence among TB patients to account for testing coverage.

For all remaining countries (that is, for countries where surveillance data were not available or where the percentage of TB patients being tested was below 50%), the prevalence of HIV was estimated indirectly according to equation 5, where t is HIV prevalence among incident TB cases, h is HIV prevalence in the general population (from the latest time-series published by UNAIDS) and ρ is the incidence rate ratio (IRR) (that is, the incidence rate of TB in HIV-positive people divided by the incidence rate of TB in HIV-negative people).[1]

$$t = \frac{h.\rho}{1 + h(\rho - 1)} \qquad 5$$

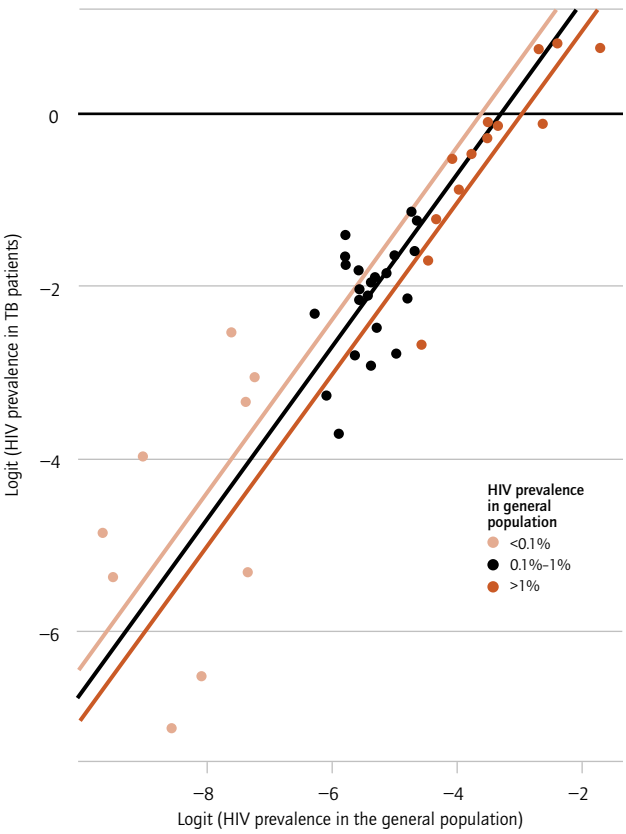
To estimate ρ from empirical data, equation 5 was rearranged as follows:

$$\rho = \frac{t.(1-h)}{h.(1-t)} \qquad 6$$

Using data from 44 countries where HIV prevalence in the general population has been estimated by UNAIDS as an independent variable, a linear model of logit-transformed t was fitted using logit-transformed h. When applied to data from 2007, the model indicates an estimated slope that is not significantly different from 1 (FIGURE A2.1). A model with a slope constrained to 1 was run separately for three levels of HIV epidemic. These were defined as HIV prevalence greater to or equal than 1% in the general population (high HIV), prevalence between 0.1% and 1% (medium HIV) and prevalence lower than 0.1% (low HIV, FIGURE A2.1). When exponentiated, the intercept equals the incidence rate ratio ρ. When data for 2007 were used, its value was 20.6 (95% confidence interval 15.4–27.5) for high HIV, which is much higher than the estimate of 6 that has been used in previous years. The estimated IRR for medium HIV was 26.7 (95% confidence interval 20.4–34.9) and for low HIV, 36.7 (11.6–116).

The predicted IRRs were also used to calculate the prevalence of HIV in TB cases for the years 1990–2006, using equa-

FIGURE A2.1
Relationship between the prevalence of HIV in TB patients and the prevalence of HIV in the general population



[1] Data on HIV prevalence in the general population are unpublished data provided to WHO by UNAIDS.

tion 5. Although existing data suggest that the IRR increases as HIV epidemics mature, there is large uncertainty about its trend. Therefore, estimates of HIV prevalence among TB cases in years before 2007 are more uncertain than the estimates for 2007.

Given a much higher estimate of the IRR compared with previous years, estimates of the number of HIV-positive cases published in this report (CHAPTER 1; ANNEX 1; ANNEX 3) are much higher than those published in previous years. Moreover, and as a direct consequence, estimates of TB mortality are also higher than estimates published in previous years. This is because mortality rates among HIV-positive TB cases are estimated to be much higher than those in HIV-negative TB cases (see also A2.2.6).

A2.2.5 Estimates of TB prevalence rates, 1990–2007

For all countries and all years, the prevalence of TB is generally estimated as incidence multiplied by the duration of disease (using equation 2 above). The exception is the reference year described in A2.2.5, if incidence in that year was based on the results of a prevalence survey (that is, equation 2 was used to estimate incidence in the reference year).

The duration of disease is estimated based on three considerations:

a. whether TB cases are HIV-positive or HIV-negative;
b. whether TB cases are sputum smear-positive or not;
c. whether TB cases are treated in DOTS programmes, treated outside DOTS programmes, or untreated.

Five steps are used to estimate the average duration of disease in any given year and in any given country.

1. TB cases (the total number of estimated incident cases) are divided into two categories: cases that are HIV-positive and cases that are HIV-negative. The methods used to estimate the proportion of cases that are HIV-positive are described above in A2.2.4.

2. HIV-positive and HIV-negative cases are subdivided according to whether they are sputum smear-positive or not (thus giving four categories of incident TB case). Fot countries in all subregions except Latin America, it is assumed that 45% of HIV-negative and 35% of HIV-positive TB cases are sputum smear-positive. These two assumptions are based on observational data on the natural history of TB.[1] For countries in the Latin America subregion, it is assumed that 55% of HIV-negative and 45% of HIV-positive TB cases are sputum smear-positive.

3. Cases in each of the four categories resulting from step 2 are subdivided into three further subcategories: treated under DOTS, treated outside DOTS programmes, and untreated. This results in 12 categories of incident case. For each of the four categories defined in step 2, the proportion treated under DOTS is calculated as DOTS notifications divided by the estimated total incidence, and is calculated separately for a) smear-positive cases and b) other types of case. The maximum proportion of cases that are untreated is estimated by smear status, based on previous reviews of data about access to health services, drug availability, healthcare infrastructure and other qualitative information. The proportion of cases that are treated outside DOTS programmes is estimated as either non-DOTS notifications divided by estimated incidence or as 100% minus the proportion treated under DOTS minus the maximum untreated proportion, whichever is larger. Once the DOTS and non-DOTS proportions have been calculated, the remainder is assumed to be untreated.

4. The average duration of disease is specified for each of the 12 subcategories resulting from step 3. The duration of disease is assumed to be shorter for cases treated in DOTS programmes, and shorter among untreated HIV-positive TB cases.

5. The overall duration of disease is estimated as a weighted average, using the numbers of cases in each of the 12 subcategories and the average duration of disease estimated for each of these 12 subcategories.

For the parameters used to estimate the average duration of disease, please consult the reference material cited in A2.2.2.

A2.2.6 Estimates of TB mortality rates, 1990–2007

The number of deaths from TB is estimated by multiplying TB incidence in each year by the estimated case fatality rate. Case fatality rates are first estimated for each of the 12 subcategories of case described in A.2.2.5. The estimated case fatality rate for each subcategory is then multiplied by the number of incident cases in each subcategory (as described in Steps 1–3 in A.2.2.5).

The following points are worth highlighting:

- case fatality rates are estimated to be lowest for cases treated in DOTS programmes, higher for cases that are treated outside DOTS programmes and highest for cases that are not treated at all. No adjustment to account for whether patients have drug-resistant TB or not is made;
- the case fatality rate for HIV-positive TB patients who are treated in DOTS programmes is assumed to be 10%. Patients who are HIV-positive and treated in non-DOTS programmes are assumed to have a higher case fatality rate, which is estimated on a country-by-country basis. No adjustment to account for whether or not patients are on antiretroviral treatment (ART) is made;
- the case fatality rate for untreated cases is assumed to be the same in all countries. This is an 83% case fatality rate for HIV-positive and sputum-smear positive cases; a 70% case fatality rate for HIV-negative and sputum-smear positive cases; a 74% case fatality rate for HIV-positive cases that are sputum-smear negative;

[1] Dye C et al. Global burden of tuberculosis: estimated incidence, prevalence and mortality by country. *Journal of the American Medical Association*, 1999, 282:677–686.

and a 20% case fatality rate for HIV-negative cases that are sputum-smear negative;

- the difference in the case fatality rate between smear-positive cases and other cases is assumed to be smaller among HIV-positive cases than among HIV-negative cases. This is because smear-negative status in an HIV-positive individual is not necessarily indicative of less severe disease.

A2.2.7 Estimates of MDR-TB

The proportion of new and retreatment cases with MDR-TB in 2007 was estimated using data from drug resistance surveys or routine surveillance (DRS)[1] for 113 (new cases) and 102 (retreatment cases) countries, respectively. For countries without empirical data, estimates of the proportion of new and retreatment cases with MDR-TB were made using statistical models that have been described elsewhere.[2]

The number of incident MDR cases m was computed according to the following equation, where ρ_n is the probability of MDR in new cases (with no history of previous treatment), ρ_r is the probability of MDR in re-treatment cases, c is the number of incident episodes of TB, n is the number of first episodes of MDR-TB and r is the number of any other subsequent episodes:

$$m = \sum_{i=n,r} \rho_i c_i$$

The incidence of subsequent episodes of MDR-TB was estimated using the following equation:

$$c_r = \frac{r}{n} c_n$$

Here, n is the number of newly notified TB cases and r is the number of notified re-treatment cases that occurred in 2007. The re-treatment ratio r/n was estimated as an average of the values observed in the three years 2005–2007.

Two quasi-binomial logistic regression models, in which the proportion of cases with MDR-TB was the dependent variable, were fitted for new cases and re-treatment cases separately. The independent variables used in the model for new cases were epidemiological region as defined in previously published analyses, the log of gross national income (GNI) per capita in 2008,[3] and the re-treatment ratio r/n. The independent variables used in the model for re-treatment cases were epidemiological region (defined as for new cases), the prevalence of HIV in new TB cases and the reported rate of treatment failure in the cohort of new cases treated in 2006. Model fits were assessed using plots of binned residuals[4] against various inputs of interest defined by the selected predictors, and estimates for both new and retreatment cases were adjusted to correct for over-dispersion.[5]

For both new and retreatment cases, the reported proportion of all TB cases that are re-treatment cases was a major influence on estimates of the number of cases that have MDR-TB. In this context, it is important to note that re-treatment cases may be misclassified as new cases in some settings – for example, if the time taken to collect information about previous treatment is too short, if there is pressure to meet targets for case detection of new cases at the local level, and if there are errors in recording and reporting. If the proportion of cases that are retreatment cases has been underestimated, then the point estimates of the number of MDR cases will be too low and confidence intervals will underestimate the true uncertainty that is associated with these point estimates.

Estimates for 2005 and 2006 were produced by assuming that the probability of MDR-TB among new and retreatment cases has remained constant during the three years 2005–2007.

Estimates of the number of incident cases of MDR-TB, disaggregated by smear status, are presented in ANNEX 3. The method used to derive estimates of the frequency of MDR-TB in new and re-treatment cases (based on direct measurement from DRS or indirect estimation from modelling) is also presented in ANNEX 3. All re-treatment cases were assumed to be smear-positive. In some countries (for example, Australia and the United States), routine data on drug sensitivity were not available for new and retreatment cases separately; for these countries, only an estimate of the total number of MDR-TB cases is presented in ANNEX 3. Estimates of the number of smear-positive cases of MDR-TB in the years 2005–2007 are also presented in the country profiles that appear in ANNEX 1. These estimates can be used to set targets for detection and treatment of MDR-TB cases by NTPs.

It should be noted that estimates of the numbers of MDR cases presented in this report may substantially differ from those previously published by WHO. Differences are due to changes in estimation methods and new data, as opposed to real changes in the epidemiological burden of MDR-TB.

A2.2.8 Case notification and case detection

The term "case notification", as used here, means that TB is diagnosed in a patient and is reported within the national surveillance system, and then to WHO. While the emphasis is on new smear-positive cases, we also present the numbers of all

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1 *Anti-tuberculosis drug resistance in the world. Fourth global report: the WHO/IUATLD Global Project on Anti-tuberculosis Drug Resistance Surveillance.* Geneva, World Health Organization, 2008 (WHO/HTM/TB/2008.394).

2 Zignol M et al. Global incidence of multidrug-resistant tuberculosis. *Journal of Infectious Diseases*, 2006, 194:479–485.

3 World Bank, 2008. See devdata.worldbank.org/data-query (accessed in December 2008).

4 Gelman A and Hill J. Data Analysis Using Regression and Multilevel/Hierarchical Models, Cambridge University Press, 2006.

5 Over-dispersion was measured by comparing the sum of squared standardized residuals to a χ^2 distribution with $n-k$ degrees of freedom, where n is the number of data points and k is the number of estimated model parameters. In quasi-binomial logistic models, the standard deviation has the form: $\sqrt{\omega n \rho(1-\rho)}$, where $\omega > 1$ is the over-dispersion parameter. The over-dispersion parameter ω was estimated to be > 9 for both new and retreatment cases. Without adjustment for over-dispersion, confidence intervals would be too narrow, and the precision of estimates would be overstated.

TB cases reported – smear-positive and smear-negative pulmonary cases – in addition to those in whom extrapulmonary disease is diagnosed. The number of cases notified in any year is the sum of new and relapse cases. Case reports that represent a second registration of the same patient or episode (that is, re-treatment after failure or default) are presented separately.

The case detection rate is calculated as the number of cases notified in a given year divided by the number of incident cases estimated for that year, expressed as a percentage. Case detection is presented in three main ways: (a) for new smear-positive cases (excluding relapse cases); (b) for all new cases (all clinical forms of TB, excluding relapse cases); and (c) for smear-positive cases and all new cases, in DOTS programmes only.

$$\text{DOTS case detection rate} = \frac{\text{annual new smear–positive notifications (DOTS)}}{\text{estimated annual new smear–positive incidence (country)}} \qquad 7$$

$$\text{Case detection rate} = \frac{\text{annual new smear–positive notifications (country)}}{\text{estimated annual new smear–positive incidence (country)}} \qquad 8$$

The global target of a 70% case detection applies to the DOTS case detection rate in equation 7. Even when a country has not achieved full geographical coverage of DOTS, we use the incidence estimated for the whole country as the denominator of the DOTS case detection rate, as in equation 7. The DOTS case detection rate and the case detection rate for the whole country are identical when a country reports only from DOTS areas. This generally happens when DOTS coverage is 100%, but in some countries where DOTS is implemented in only part of the country, no TB notifications are received from the non-DOTS areas. Furthermore, in some countries where DOTS coverage is 100%, patients may seek treatment from non-DOTS providers that, in some cases, notify TB cases to the national authorities.

Although these indices are termed "rates", they are actually ratios. The number of cases notified is usually smaller than the estimated incidence because of incomplete coverage by health services, under-diagnosis, or deficient recording and reporting. However, the calculated rate of case detection can exceed 100% if case-finding has been intense in an area with a backlog of existing cases, if there has been over-reporting (for example, double-counting) or over-diagnosis, or if estimates of incidence are too low. If the expected number of cases per year is very low (for example, less than one), the case detection rate can vary markedly from year to year because of chance. Whenever this index comes close to or exceeds 100%, we attempt to investigate, as part of the joint planning and evaluation process with NTPs, which of these explanations is correct.

For the first time, the country profiles in ANNEX 1 include maps that show subnational variation in notification rates. Geographical variation in notification rates may reflect true differences in TB incidence, or variation in other factors such as efforts to find and diagnose cases. If variation in notification rates is greater than would be expected by chance, further investigation to understand the reasons is warranted.

A2.2.9 Outcomes of treatment

The treatment success rate in DOTS programmes is defined as the percentage of new smear-positive patients who are cured (negative on sputum smear examination), plus the percentage who complete a course of treatment, without bacteriological confirmation of cure (TABLE A2.1). Cure and completion are among the six mutually exclusive treatment outcomes.[1] The sum of cases assigned to these outcomes, plus any additional cases registered but not assigned to an outcome, adds up to 100% of cases registered (that is, the treatment cohort).

In this report, the country profiles that appear in ANNEX 1 show trends in treatment success rates for all notified cases (i.e. cases notified by DOTS and non-DOTS programmes) from 2000 to 2006. This indicator allows assessment of national changes in treatment success rates as well as the overall improvements that have been achieved as DOTS programmes have expanded. Where there has been substantial geographical expansion of DOTS since 2000, treatment success rates for DOTS and non-DOTS areas combined may be considerably different (typically lower) than treatment success rates for DOTS programmes specifically. Trends in treatment success rates for DOTS programmes only are presented in ANNEX 3.

We also compare the number of new smear-positive cases registered for treatment with the number of cases notified as smear-positive. All notified cases should be registered for treatment, and the numbers notified and registered should therefore be the same (discrepancies can arise, however, for example, when subnational reports are not received at the national level). If the number registered for treatment is not provided, we take as the denominator for treatment outcomes the number notified for that cohort year. If the sum of the six outcome categories is greater than the number registered (or the number notified), we use this sum as the denominator.

The number of patients presenting for a second or subsequent course of treatment, and the outcome of further treatment, are indicative of NTP performance and levels of drug resistance. We present in this report, where data are available, the numbers of patients registered for re-treatment, and the outcomes of re-treatment, for each of four registration categories: smear-positive re-treatment after relapse; failure; default; and other re-treatment (including pulmonary smear-negative and extrapulmonary).

The assessment of treatment outcomes for a given calendar year always lags case notifications by one year, to ensure

[1] *Treatment of tuberculosis: guidelines for national programmes*, 3rd ed. Geneva, World Health Organization, 2003 (WHO/CDS/TB/2003.313).

that all patients registered during that calendar year have completed treatment. For MDR-TB patients, who have longer treatment regimens, the lag is three years.

A2.3 Implementation of the Stop TB Strategy

The "strategy" section of the questionnaire described in A2.1 was structured around the six major components and subcomponents of the Stop TB Strategy: pursue high-quality DOTS expansion and enhancement; address TB/HIV, MDR-TB and the needs of poor and vulnerable populations; contribute to health-systems strengthening based on primary health care; engage all care providers; empower people with TB, and communities through partnership; and promote and enable research. In 2008, greater emphasis was placed on the collection of quantitative data in a shorter and more user-friendly format, compared with the data collection form used in 2007. There was positive feedback about these changes, although the data that were reported show that it remains difficult for many countries to report accurate and quantitative data about several key elements of TB control. Examples include data related to the contribution of public-public and public-private mix (PPM) to case notifications and treatment, community-based TB care (CBTC), human resource development (HRD), the number of laboratories and the number of laboratory tests being done for different types of case, and advocacy, communication and social mobilization (ACSM).

Specific additional details about data collection or analysis for DOTS implementation, collaborative TB/HIV activities, diagnosis and treatment of MDR-TB and case detection through quality-assured bacteriology are provided below.

A2.3.1 DOTS and the Stop TB Strategy

Before the launch of the Stop TB Strategy in 2006, NTPs reporting to WHO were classified as either DOTS or non-DOTS, based on the elements listed in TABLES 2.1 AND 2.2 (see CHAPTER 2). To be classified as a country implementing DOTS in a given year, a country must have officially accepted and adopted the DOTS strategy in that year (or earlier), and must have implemented its four technical components in at least part of the country. Based on NTP responses to standard questions about policy – and usually on further discussion with the NTP – we accept or revise each country's own determination of its DOTS status.

DOTS coverage is defined as the percentage of the national population living in areas where health services have adopted DOTS. "Areas" are the lowest administrative or basic management units[1] in the country (townships, districts, counties, etc.). If an area (with its one or more health facilities) is considered by the NTP to have been a DOTS area in any given year, then all the cases registered and reported by the NTP in that area are considered DOTS cases, and the population living within the boundaries of that area counts towards the national DOTS coverage. In some cases, treatment providers that are not following DOTS guidelines (for example, private practitioners, or public health services outside the NTP such as those within prisons) notify cases to the NTP. These cases are considered non-DOTS cases, even if they are notified from within DOTS areas. However, when certain groups of patients treated by DOTS services receive special regimens or management (for example, nomads placed on longer courses of treatment), these are considered DOTS cases. As the number of countries that are not implementing DOTS or that have not yet achieved national coverage is now small, DOTS coverage is becoming a less relevant indicator.

DOTS coverage as described above is a crude indicator of the actual proportion of people who have access to DOTS services. Where countries are able to provide more precise information about access to DOTS services, this information is reported in the country notes of ANNEX 3. The case detection rate (defined above in A2.2.8) is a more precise measure of DOTS implementation but is also more demanding of data.

A2.3.2 Collaborative TB/HIV activities

In 2002, questions on collaborative TB/HIV activities were introduced into the WHO data collection form for the first time and sent to 41 priority countries. These countries were selected because they accounted for 97% of the estimated global number of HIV-positive TB cases.[2] From 2003–2005, data on three aspects of collaborative TB/HIV activities were requested from all countries: HIV testing of TB patients, and provision of CPT and of ART to those TB patients found to be HIV positive. In 2005, all questions were sent to the 41 countries described above and to an additional 22 countries.[3] These countries were added to the list of countries that were sent the full set of questions because they were defined by UNAIDS as having a generalized HIV epidemic (UNAIDS 2004).[4] In 2006 and 2007, all questions were sent to all 63 countries. In 2008, all questions were sent to all countries.

For those indicators that require both a numerator and a denominator, countries reported only the numerator or only the denominator. Given this incompleteness in reporting, estimates of the proportion of HIV-positive TB cases treated with CPT and ART, and the proportion of TB cases tested that were HIV-positive, were based on "matched data", that is, reported figures are based on data from only those countries that

[1] The basic management unit is defined in terms of responsibility for management, supervision and monitoring. It may have several treatment facilities, one or more laboratories, and one or more hospitals. The defining aspect is the presence of a manager or coordinator who oversees TB control activities for the unit and who maintains a master register of all TB patients being treated, which is used to monitor the programme and report on indicators to higher levels.

[2] The 41 countries are Angola, Botswana, Brazil, Burkina Faso, Burundi, Cambodia, Cameroon, the Central African Republic, Chad, China, the Congo, Côte d'Ivoire, Djibouti, the Democratic Republic of the Congo, Ethiopia, Ghana, Haiti, India, Indonesia, Kenya, Lesotho, Malawi, Mali, Mozambique, Myanmar, Namibia, Nigeria, the Russian Federation, Rwanda, Sierra Leone, South Africa, the Sudan, Swaziland, Thailand, Togo, Uganda, Ukraine, the United Republic of Tanzania, Viet Nam, Zambia and Zimbabwe.

[3] The 22 countries are the Bahamas, Barbados, Belize, Benin, the Dominican Republic, Equatorial Guinea, Eritrea, Estonia, Gabon, Guatemala, Guinea, Guinea-Bissau, Guyana, Honduras, Jamaica, Liberia, Madagascar, the Niger, Panama, Somalia, Suriname, and Trinidad and Tobago.

[4] HIV prevalence estimates for 2004 (unpublished data) Geneva, Joint United Nations Programme on HIV/AIDS.

provided data on both the numerator and the denominator.

Indicators for monitoring and evaluating collaborative TB/HIV activities are available from WHO.[1]

A2.3.3 Diagnosis and management of MDR-TB

In addition to the standard data collection form, we also use data compiled through the monitoring process of the Green Light Committee.

In CHAPTER 2, particular attention is given to 27 countries that have been prioritized at global level. These countries were defined using the following criteria:

- the estimated number of MDR-TB cases exceeds 4000 per year; and/or
- the proportion of TB cases that is estimated to have MDR-TB exceeds 10%.

A2.3.4 Early case detection through quality-assured bacteriology

Between 2003 and 2005, data about laboratory services were collected from HBCs using a stand-alone questionnaire. In 2006, questions on laboratory services were introduced into the annual WHO data collection form for the first time, and data were requested from all countries. In 2007, questions were asked about the presence of a national reference laboratory (NRL), the number of microscopy, culture and DST laboratories, the number of microscopy laboratories for which external quality assurance (EQA) was carried out, the frequency of stock-outs of reagents at central and peripheral levels, and collaboration with non-NTP laboratories. These questions were retained in 2008, and supplemented by questions about the uptake of new technologies and country plans to absorb new diagnostic tools. Overall, the quality of the laboratory data that were reported was poor and inconsistent with previous reports. This suggests that essential linkages between NTPs and laboratory services have not yet been established or are weak in many countries. It is also possible that reporting is hindered by insufficient understanding of the laboratory component of the Stop TB strategy.

A2.4 Financing

A2.4.1 Data collected

Data were collected from six main sources: NTPs, the WHO-CHOICE team,[2] the WHO National Health Accounts statistics, Global Fund proposals and databases, previous WHO reports in this series, and epidemiological and financial analyses carried out for the Global Plan.[3] In 2008, data were collected directly from countries using a two-page questionnaire included in the standard WHO data collection form (described above in A2.1). NTP managers were asked to complete four tables. The first two tables required a summary of the NTP budget for fiscal years 2008 and 2009, in US dollars, by line item and source of funding (including a column for funding gaps). The third table requested NTP expenditure data for 2007, by line item and source of funding. The fourth table requested information about the way in which general health infrastructure is used for TB control (for example, the number of beds dedicated to TB patients that are available, the number of outpatient visits that patients need to make to a health facility during treatment and the average length of stay when patients are admitted to hospital). Estimates of the number of patients who would be treated in 2008 and 2009 were also requested for (a) new smear-positive cases (b) new smear-negative and extrapulmonary cases, (c) HIV-positive TB patients on ART and (d) cases with MDR-TB.

Line items for the budget tables are designed to be in line with the Stop TB Strategy and to allow for comparisons with the cost categories used in the Global Plan. A total of 14 line items were defined: first-line drugs; dedicated NTP staff; routine programme management and supervision activities; laboratory supplies and equipment; PAL; PPM; second-line drugs for MDR-TB; management of MDR-TB (budget excluding second-line drugs); collaborative TB/HIV activities; ACSM; community-based care; operational research; surveys of disease prevalence and infection; and all other budget lines for TB (e.g. technical assistance). The relationship of these items to the Stop TB Strategy and the Global Plan and the categories used for presentation of financial analyses in this report are shown in TABLE A2.2.

A2.4.2 Data entry and analysis

A standardized Microsoft Excel worksheet was created, which generates financial tables and related figures for each country that reported data for each year 2002–2009. The workbook also contains additional worksheets for summary analyses and for the data required as inputs to the country-specific analyses (for example, unit costs for bed-days and outpatient clinic visits, national health account statistics). This system allows a systematic analysis of each country's data, which in turn is used to determine which countries, other than HBCs, have provided data of sufficient quality to be included in the main figures and tables of the report. This country worksheet includes 13 tables and related figures:

- NTP budget by line item for each year 2002–2009. Line items were grouped to allow for comparisons with the Stop TB Strategy and the Global Plan. This grouping, both for the budget categories used in 2006–2009 and for those used in 2002–2005, is explained in TABLE A2.2.
- NTP budget by line item for each year 2002–2009, according to the categories used in each round of data collection.

[1] *A guide to monitoring and evaluation for collaborative TB/HIV activities*. Geneva, World Health Organization, 2004 (WHO/HTM/TB/2004.342 and WHO/HIV/2004.09; available at http://www.who.int/hiv/pub/tb/en/guidetomonitoringevaluationtb_hiv.pdf; accessed January 2008).

[2] The WHO-CHOICE (CHOosing Interventions that are Cost-Effective) team conducts work on the costs and effects of a wide range of health interventions.

[3] *The Global Plan to Stop TB, 2006–2015: methods used to assess costs, funding and funding gaps*. Geneva, Stop TB Partnership and World Health Organization, 2006 (WHO/HTM/STB/2006.38).

TABLE A2.2

Categories used to present the financial analyses in this report and their relationship to the Stop TB Strategy, the Global Plan, the budget line items used in the WHO data collection form and the budget lines used in previous WHO reports

CATEGORIES USED FOR FINANCIAL ANALYSES IN THIS REPORT, 2002–2009	STOP TB STRATEGY	GLOBAL PLAN	BUDGET LINE ITEMS, 2006–2008	BUDGET LINE ITEMS, PRE- 2006
DOTS	Component 1	DOTS	First-line anti-TB drugs; NTP staff; routine programme management and supervision activities; laboratory supplies and equipment	First-line anti-TB drugs; NTP staff; buildings, vehicles, equipment; all other budget lines for TB
MDR-TB	Component 2	MDR-TB or DOTS-Plus[a]	Second-line drugs for MDR-TB; management of MDR-TB (excluding second-line drugs)	Second-line anti-TB drugs
TB/HIV		TB/HIV	Collaborative TB/HIV activities	Collaborative TB/HIV activities
ACSM	Component 5	ACSM	ACSM	
Other (includes PPM, PAL, community-based TB care, operational research, surveys and other)	Components 3–5 and 6	New approaches to DOTS (includes PAL, PPM and community-based TB care). Operational research, surveys and other were not included as specific categories	PPM, PAL, community-based TB care, operational research and special surveys of prevalence of disease and of infection. Other for all other budget lines for TB (e.g. technical assistance)	New initiatives to increase case detection and cure rates for PPM, PAL and community-based TB care; other. Operational research and surveys were not included as a specific category

[a] DOTS-Plus is the term used to describe the management of MDR-TB patients according to international guidelines at the time of the development of the Global Plan.

- NTP budget by source of funding for each year 2002–2009, with the funding sources defined as government contribution (excluding loans), loans, Global Fund grants, grants (excluding Global Fund) and funding gap.
- NTP expenditures by source of funding for 2002–2007, with funding sources as defined for NTP budgets.
- NTP expenditures by line item for each year 2002–2007. Line items were grouped, as for budgets, to allow for comparisons with the Global Plan and the Stop TB Strategy (TABLE A2.2).
- NTP expenditure by line item for each year 2002–2007, according to the categories used in each round of data collection.
- Funding gap by line item for each year 2002–2009. Line items were grouped as for budget and expenditure tables (TABLE A2.2).
- Total costs of TB control by funding source for each year 2002–2009, with funding sources as defined for NTP budgets.
- Total costs of TB control by line item for each year 2002–2009, with line items defined as NTP budget items, hospitalization and clinic visits.
- Per patient costs, NTP budget, available funding, expenditures and budget for first-line anti-TB drugs.
- Comparison of NTP budget, available funding and expenditure for 2003–2007 by line item.[1]
- Financial indicators for 2008 and 2009, which were defined as government contribution to NTP budgets (as a percentage), government contribution to total TB control costs (as a percentage), the proportion of the NTP budget for which funding is available, the NTP budget per capita, total TB control costs per capita, the funding gap per capita, total expenditure on health per capita, and general government expenditure on health per capita.
- Comparison of total costs based on the country report with total costs implied by the Global Plan, for 2006–2009.

Budget data for 2002–2007 and expenditure data for 2003–2006 were taken from the forms used in previous years, while budget data for 2008–2009 and expenditure data for 2007 were taken from the 2008 data collection form. Total TB control costs were estimated by adding costs for hospitalization and outpatient clinic visits to either NTP expenditures (for 2002–2007) or NTP budgets (for 2008–2009). Expenditures were used in preference to budgets for 2002–2007 because they reflect actual costs, whereas budgets can be higher than actual expenditures (for example, when large budgetary funding gaps exist or when the NTP does not spend all the available funding). When expenditures are known for 2008 and 2009, they will be used instead of budget data to calculate, retrospectively, the total cost of TB control in these years. For countries other than HBCs, expenditures before 2003 are not available in our database. For some HBCs, expenditures were not available for 2002–2007. In this case, we estimated expenditures based on available funding, which was calculated as the total budget minus the funding gap. The exceptions were South Africa and Thailand, which reported budget and expenditure data for the first time in 2006 and 2008, respectively. In previous annual reports, costs in South Africa were based on costing studies undertaken in the mid-to-late 1990s and costs in Thailand were not calculated because data were absent. Given the availability of new information the previous cost estimates for 2002–2004 (South-Africa) and 2002–2007 (Thailand) were revised by assuming that per patient costs in these years would be as for 2006 (South Africa) and 2008 (Thailand). Total costs were then estimated by multiplying total case notifications in each year by the estimated cost per patient treated.

[1] Expenditure data are available for a larger set of countries in 2003 compared with 2002. For this reason, comparisons are with 2003.

The total cost of outpatient clinic visits was estimated in two steps. First, the unit cost (in US$)[1] of a visit was multiplied by the average number of visits required per patient (estimated on the WHO data collection form) to give the cost per patient treated. This was done separately for (a) new smear-positive cases and (b) new smear-negative and extrapulmonary cases. Second, the cost per patient treated was multiplied by the number of patients notified (for 2002–2007) or the number of patients whom the NTP expects to treat (for 2008–2009). The total costs for the two categories of patient were then summed. The cost of hospitalization was generally calculated in the same way, replacing the unit cost of a clinic visit with the unit cost of a bed-day. However, the number of dedicated TB beds was used to calculate the cost of hospitalization when the total cost of these beds is higher than the total cost estimated by multiplying the country's estimate of the number of bed-days per patient by the number of patients treated. For HBCs, this was the case for 11 countries that have dedicated TB beds: Bangladesh, Brazil, Cambodia, Ethiopia, India, Kenya, Mozambique, Myanmar, the Russian Federation, South Africa and Viet Nam. We assumed that all clinic visits and hospitalization are funded by the government, because staff and facility infrastructure are the major inputs included in the unit cost estimates and these are typically not funded by donors.

Per patient costs, budgets, available funding and expenditures were calculated by dividing the relevant total by the number of cases notified (for 2002–2007) and the number of patients whom the NTP expects to treat (for 2008–2009). Since the total costs of TB control for 2002–2007 were based on expenditure data, it is possible that the total TB control cost per patient treated is less than the NTP budget per patient treated when the funding gap is large or there is a significant budgetary under-spend. In addition, for 2002–2007, expenditures per patient were sometimes higher than the available funding per patient. This can occur when the NTP budget funding gap is reduced after the reporting of budget data to WHO (since available funding is estimated as the total budget minus the funding gap). To try to eliminate this problem, the data collection form has allowed countries to update budget data reported in the previous round of data collection since 2005 (for example in the 2005 round of data collection, countries were able to update 2005 budget data originally reported in 2004; in the 2008 round of data collection, countries were able to update 2008 budget data originally reported in 2007).

Costs based on country reports reflect actual country plans for TB control. To address the question of whether these costs are in line with the Global Plan, the regional costs that appear in the Global Plan were converted into estimates for individual countries. While these costs should be seen as approximations only, they can be used to identify important similarities and differences between country reports and the Global Plan. Differences may occur if the intervention coverage and rates of scale up (for example, the number of TB patients to be treated or the number of HIV-positive TB patients to be enrolled on ART) planned by countries since 2006 are more or less ambitious than the projections included in the Global Plan, and/or if country-specific budget development is based on input prices that are more or less than the average regional prices used in the Global Plan. A further reason for discrepancies is that, while the Global Plan includes the full cost of collaborative TB/HIV activities, the budget for these activities that is reported by NTPs may include only the budget managed by the NTP, and not the budget for such activities that is managed by the national AIDS control programme. In the 2007 and 2008 rounds of data collection, we were able to improve our understanding of both TB and HIV budgets for collaborative TB/HIV activities in several countries (for example, in Kenya and the United Republic of Tanzania). TABLE A2.3 summarizes the methods used to convert regional costs as they appear in the Global Plan into estimates for individual countries.

All budget and expenditure data are reported in nominal prices (that is, prices are not adjusted for inflation) rather than in constant prices (that is, all prices are adjusted to a common year). This means that values given for individual countries in this series of reports for 2002–2008 do not have to be adjusted, which makes it easier for country staff to review the data for previous years.

Once the data were entered, any queries were discussed with NTP staff and the appropriate WHO regional and country office, and a final set of charts and tables was produced.

High-burden countries

For HBCs specifically, seven of these charts plus a summary table appear in the profiles for each country at ANNEX 1: NTP budget by funding source 2002–2009; NTP budget line items in 2009, according to the line items used in the 2008 round of data collection; NTP budget by line item 2002–2009, with line items as defined in the first column of TABLE A2.2; NTP funding gap by line item, with line items as defined in the first column of TABLE A2.2; total TB control costs by line item 2002–2009; per patient costs, budgets, available funding, expenditures and budget for first-line anti-TB drugs 2002–2009; costs according to country reports compared with costs implied by the Global Plan for 2006–2009; and a summary table including the NTP budget and funding gap by component of the Stop TB Strategy for 2009.[2] In some instances, the review process led to revisions to data included in previous annual reports. For this reason, figures sometimes differ from those published in the 2002–2008 reports.

Nine financial indicators appear in the profiles for each country at ANNEX 1. These indicators were calculated as follows:

[1] Average costs in the WHO-CHOICE database are reported in local currency units. These were converted into US$ using exchange rate data provided in the IMF *International financial statistics yearbook*. Washington, DC, International Monetary Fund, 2003.

[2] A full set of charts and data is available upon request to tbdocs@who.int.

TABLE A2.3
Methods used to allocate regional costs in the Global Plan to individual countries

COUNTRY	NUMBERS OF PATIENTS			COSTS					
	NUMBER OF SS+ AND SS–/EP PATIENTS TREATED IN DOTS PROGRAMMES	NUMBER OF MDR-TB PATIENTS TREATED IN "DOTS-PLUS" PROGRAMMES	NUMBER OF HIV+ TB PATIENTS ENROLLED ON ART	NTP BUDGET FOR DOTS, EXCLUDING NEW APPROACHES	NTP BUDGET FOR NEW APPROACHES TO DOTS IMPLEMENTATION	BUDGET FOR ACSM	BUDGET FOR ART FOR HIV+ TB PATIENTS, AND OTHER COLLABORATIVE TB/HIV ACTIVITIES	NTP BUDGET FOR MDR-TB TREATMENT	COSTS ASSOCIATED WITH UTILIZATION OF GENERAL HEALTH SERVICES, FINANCED FROM GENERAL HEALTH FACILITY BUDGETS
Afghanistan Bangladesh Cambodia China India Indonesia Myanmar Pakistan Philippines Thailand Viet Nam	Global Plan regional numbers allocated to each country according to its share of the regional burden of TB (in 2004).	Global Plan regional numbers allocated to each country according to its estimated share of the regional burden of MDR-TB cases in 2003 (source: DOTS-Plus Working Group).	Estimates were made for each country as a joint effort by the Stop TB Partnership and UNAIDS for the Global Plan. Country-specific numbers were therefore already available and no allocation process was required.	The NTP budget per patient in each country in 2005 was used in the Global Plan to estimate a budget per patient for the region as a whole, with each country weighted according to its share of regional cases. To return to country-specific estimates, we used the NTP budget per patient in each country that was used in the Global Plan. This is the NTP budget reported in the 2005 WHO TB control report, excluding second-line drugs and collaborative TB/HIV activities. The NTP budget for each country that underpinned the Global Plan regional calculations was then multiplied by the number of cases to be treated (estimated as explained in column 2).	Global Plan cost estimates were first made for a standard population of 500 000, or in the case of culture and DST laboratories for a population of 5 million, based on regional unit prices. These unit costs were then multiplied by a factor according to the size of the regional population to be covered (e.g. if the population to be covered was 100 million, the unit cost was multiplied by 200, or by 20 in the case of culture and DST laboratories). To estimate costs for each country, Global Plan costs for each region were allocated to each country according to its share of the regional population.		The number of TB/HIV patients on ART was multiplied by the unit cost of providing ART, estimated by UNAIDS for each country as part of the development of the Global Plan. For other activities, the number of patients was allocated to a country according to its share of the regional TB/HIV burden and then multiplied by the country-specific unit cost used in the Global Plan.	Calculated as the number of MDR-TB cases to be treated multiplied by a country-specific unit cost. Country-specific unit costs estimated by adjusting the regional cost used in the Global Plan according to GNI per capita (except for the cost of drugs, which were assumed to be the same in all countries).	Calculated on a per patient basis for each country according to the inputs reported in the 2007 WHO data collection form. Unit costs for hospitalization and outpatient visits are WHO country-specific estimates as opposed to the DCPP regional estimates used in the Global Plan. Costs for diagnostic tests among TB suspects were included in the Global Plan, but were not included in the country-specific estimates because there are no comparative data from countries (the number of such tests is not requested on the WHO data collection form).
Brazil Russian Federation	Global Plan regional numbers allocated to each country according to its share of the regional burden of TB (in 2004), then adjusted according to target level of DOTS population coverage set out in the Global Plan.								
DR Congo Ethiopia Kenya Mozambique Nigeria South Africa Uganda UR Tanzania Zimbabwe	Global Plan regional numbers allocated to each country according to its share of regional cases treated under DOTS (in 2004).								

DCPP indicates Disease Control Priorities Project of the World Bank; DOTS-Plus, the term used for the management of MDR-TB patients according to international guidelines at the time of the development of the Global Plan; DST, drug susceptibility testing; HIV+, HIV-positive; NTP, national tuberculosis control programme; ss+, sputum smear-positive; ss–, sputum smear-negative; EP, extrapulmonary.

- Government contribution to the NTP budget (including loans). This was calculated as the sum of funds for the NTP from the government (including loans), divided by the total NTP budget.
- Government contribution to the total cost of TB control (including loans). This was calculated as the sum of funds from the government (including funds for the NTP and funds for resources within the general health-care system that are used for TB control), divided by the total cost of TB control.
- Government health spending used for TB control. This was calculated as the total cost of TB control divided by general government expenditure on health.[1]
- Percentage of the NTP budget that is funded. This was estimated as the available funding (the sum of funds from the government, including loans, plus funds from the Global Fund and other donors), divided by the total NTP budget.
- NTP budget per capita, total TB control costs per capita and funding gap per capita. These indicators were calculated as the total NTP budget, total cost of TB control and the funding gap, respectively, divided by the population of the country.
- Government health expenditure per capita and total health expenditure per capita.[1] These estimates show how much money is spent on health care by the government, and how much is spent in total (including expenditures in the private sector), per capita.

To assess whether increased spending on TB control has resulted in an increase in the number of cases detected and treated in DOTS programmes, the change in total NTP expenditures between 2003 and 2007 was compared with the change between 2003 and 2007 in (a) the total number of TB cases treated in DOTS programmes and (b) the total number of new smear-positive cases treated in DOTS programmes. This was done for all HBCs for which the necessary data existed (not all countries have reported expenditure data for both years).

Finally, the associations between GNI per capita in 2007 and government contributions to total NTP budgets and TB control costs were examined. Data on GNI per capita were taken from *World development indicators database*.[2]

Other countries

For countries other than the HBCs, the data provided on the 2008 data collection form were used to assess NTP budgets by region in 2009 and to compare these data with the budgets reported by the HBCs. Only countries that submitted complete data of sufficient quality (for example, data whose subtotals and totals were consistent by both line item and funding source) were used. In addition, trends in total costs were assessed by using data from all countries with sufficient data from 2006 to 2009. Costs were analysed according to the components of the Stop TB Strategy.

Estimates were also made of the costs implied by the Global Plan for the 171 countries in the regions covered by the plan, as described above for the 22 HBCs. These values were aggregated for each WHO region for the subset of countries that (a) provided a complete budget report to WHO and (b) were included in the Global Plan. The total number of countries (apart from HBCs) meeting both criteria was 72. These aggregated values were then compared with costs according to country reports.

A2.4.3 Global Fund contribution to TB control

Available funding from the Global Fund was evaluated both for HBCs and for other countries, as announced after the first eight rounds of funding. Total approved funding at the end of 2008, disbursements to the end of 2008, the time taken between approval of a proposal and the signature of grant agreements, and the time taken between the signing of the grant agreement and the first disbursement of funds was assessed. Also assessed was how the total value of grants awarded for TB control had evolved between rounds 1 and 8, and the approval rate. The approval rate was calculated as the number of proposals considered by the Global Fund Technical Review Panel in each round divided by the number of proposals approved in each round (including proposals approved after appeal). This approval rate was compared with applications for funding for malaria and HIV.

[1] *National health accounts* [online database]. Geneva, World Health Organization, 2008.
[2] Accessed in December 2008: devdata.worldbank.org/data-query.

ANNEX 3

The Stop TB Strategy, case reports, treatment outcomes and estimates of TB burden

Explanatory notes

Summary by WHO region

Africa

The Americas

Eastern Mediterranean

Europe

South-East Asia

Western Pacific

Explanatory notes

The following tables present detailed data, first summarized by WHO region, then by country (grouped by WHO region).[1] Unless otherwise specified, rates are per 100 000 population,[2] using the total population of a country (*not*, for example, only the population covered by DOTS, or only HIV+ve people).

Estimates for all years are recalculated as new information becomes available and techniques are refined, so they may differ from those published previously.

NTP manager (or equivalent) and/or person(s) responsible for completing data collection form

The people named on the data collection form returned to WHO in 2008. This list acknowledges the contribution of NTP managers and others; those named are not necessarily the current NTP managers.

TABLE A3.1 Methods and assumptions for estimation of TB incidence, prevalence and mortality

The principal assumptions and methods used to estimate TB incidence (including incidence of TB in HIV-positive people), prevalence and mortality, and the prevalence of MDR among new and re-treatment cases for each country. See ANNEX 2 for details of calculations.

TABLE A3.2 Estimated burden of TB, 1990 and 2007

- For 1990 (baseline year for MDG): estimates of incidence (all forms and smear-positive); prevalence and mortality.
- For 2007: estimates of incidence (all forms and smear-positive), prevalence and mortality, in all people and in HIV-infected people only.

Incidence, prevalence and mortality presented as absolute numbers and as rates per 100 000 population.

- Estimated prevalence of HIV infection in incident TB cases, 2007.
- Estimates of the percentage of TB cases that are MDR (calculated for new and re-treatment cases separately) and of the number of MDR-TB cases (for all forms and smear-positive cases), 2007.

TABLE A3.3 Estimated incidence of TB (all forms) in all people, 1990–2007

The current estimates (numbers and rates per 100 000 population) of TB incidence from 1990 to 2007, including in HIV-negative and HIV-positive people.

TABLE A3.4 Estimated incidence, prevalence and mortality rates, 2000–2007

- The estimated incidence of TB in HIV-positive people, expressed as incident cases per 100 000 population (both HIV-infected and un-infected people are included in the denominator), 2000–2007.
- The estimated prevalence of TB (including cases in HIV-negative and HIV-positive people), 2000–2007.
- Estimated mortality from TB in HIV-negative people (both HIV-infected and un-infected people are included in the denominator), 2000–2007.
- Estimated mortality from TB in HIV-positive people (both HIV-infected and un-infected people are included in the denominator), 2000–2007.

TABLE A3.5 Case notifications and case detection rates, DOTS and non-DOTS combined, 2007

Case notifications by history of treatment (new or re-treatment), by site (pulmonary or extrapulmonary) and by smear status (smear-positive, smear-negative or unknown). See TABLE A2.1 for definitions of case types. Proportions of case types and estimated case detection rate for DOTS and non-DOTS cases combined.

- *Population*, source: *World population prospects – the 2006 revision*. New York, United Nations Population Division, 2007.
- *All notified*: all notified cases, including new cases (new smear-positive, new smear-negative/unknown/not done, other new and new extrapulmonary), re-treatment cases (relapse, treatment after failure, treatment after default and other re-treatment) and other cases (cases in patients for whom it is not known whether they have previously been treated for TB).
- *New and relapse*: new and relapse cases, including new smear-positive, new smear-negative/unknown/not done,

[1] The WHO Global TB Database, which includes data for previous years (revised as appropriate), is available at http://www.who.int/tb/country/global_tb_database/en/

[2] *World population prospects – the 2006 revision*. New York, United Nations Population Division, 2007.

other new, new extrapulmonary and (smear-positive) relapse cases (for the WHO European Region only, cases reported as "previous treatment history unknown" are also included).

- *Other new*: new cases for which the site of disease is not recorded.
- *Re-treatment cases*: smear-positive cases in patients previously treated for TB. (*Other re-treat.* includes re-treatment cases for which the outcome of previous treatment is not known, and smear-negative re-treatment cases including smear-negative relapse cases).
- *Other*: cases in patients for whom it is not known whether they have previously been treated for TB, and chronic cases (smear-positive cases in patients who have previously received re-treatment regimens).
- *New pulm. Lab. confirmed*: new cases of pulmonary TB in which the diagnosis has been confirmed by smear and/or culture examination.
- *Detection rate, all new*: the number of notified new cases divided by the estimated number of incident cases (expressed as a percentage).
- *Detection rate, new ss+*: the number of notified new smear-positive cases divided by the estimated number of incident smear-positive cases (expressed as a percentage).
- *SS+ (% of pulm.)*: the percentage of all notified new pulmonary cases that are notified as smear-positive.
- *SS+ (% of new+relapse)*: the percentage of notified new and relapse cases that are notified as new smear-positive.
- *Extrapulm. (% of new+relapse)*: the percentage of all new and relapse cases that are extrapulmonary.
- *Re-treatment (% of new+re-treatment)*: the percentage of all notified cases that are notified as re-treatment cases.

TABLE A3.6 **DOTS coverage, case notifications and case detection rates, 2007**

As for TABLE A3.5, but for DOTS notifications only.

- *DOTS coverage*: the percentage of the national population living in areas where health services have adopted DOTS.

TABLE A3.7 **Laboratory services, collaborative TB/HIV activities and management of MDR-TB, 2006–2007**

Laboratory services

- *Numbers of laboratories*: the numbers of laboratories working with the NTP that perform smear microscopy, culture or DST, and the number of laboratories performing smear microscopy that are included in external quality assurance (EQA).

Collaborative TB/HIV activities, 2006–2007

- *TB pts tested for HIV*: the number of TB patients who were tested for HIV.
- *TB pts HIV-positive*: the number of TB patients who tested positive for HIV.
- *HIV+ TB pts CPT*: the number of HIV-positive TB patients who received co-trimoxazole preventive therapy during their anti-TB treatment.
- *HIV+ TB pts ART*: the number of HIV-positive TB patients who received antiretroviral therapy during their anti-TB treatment.

Data for 2006 were requested in the data collection form in 2007 and in 2008. For those countries that provided data for 2006 in 2007 but not in 2008, the data provided in 2007 are shown.

Multidrug-resistant (MDR) TB, 2007

- *Lab-confirmed MDR*: the number of laboratory-confirmed cases of MDR-TB identified among patients (new and re-treatment) in whom TB was diagnosed in 2007.
- *DST in new cases*: the number of new TB cases in 2007 for whom drug sensitivity testing (DST) was performed at the start of treatment.
- *MDR in new cases*: the number of new cases who were identified as MDR-TB based on DST at the start of treatment.
- *Re-treatment DST*: the number re-treatment cases registered in 2007 for whom DST was performed at the start of treatment.
- *Re-treatment MDR*: the number of re-treatment cases identified as MDR-TB based on DST at the start of treatment.

TABLE A3.8 **Treatment outcomes, 2006 cohort**

The outcomes of treatment of new smear-positive cases treated under DOTS, new smear-positive cases treated under non-DOTS, and re-treatment cases treated under DOTS (all re-treatment cases combined). Note that when the outcomes of different groups of re-treatment cases are available, they are presented in TABLE A3.9.

TABLE A3.9 **DOTS re-treatment outcomes, 2006 cohort**

The outcomes of re-treatment of smear-positive cases treated under DOTS after relapse, treatment failure or default. For those countries which are not able to provide outcomes separately for the different groups of re-treatment cases, outcomes are shown in TABLE A3.8 only.

TABLE A3.10 **DOTS treatment success and case detection rates, 1994–2007**

The rates of successful treatment (the proportion of registered cases who cured or completed treatment) for new smear

positive cases treated under DOTS from 1994 to 2006 and smear-positive case detection rates under DOTS from 1995 to 2007.

TABLE A3.11 **New smear-positive case notification by age and sex, DOTS and non-DOTS, 2007**

The breakdown, by age and sex, of new smear-positive cases notified from the whole country. Some countries cannot provide the breakdown for all notified new smear-positive cases; other countries cannot provide the breakdown for new smear-positive cases alone (see COUNTRY NOTES).

TABLE A3.12 **New smear-positive case notification rates by age and sex, DOTS and non-DOTS, 2007**

The rates of notification of new smear-positive cases by age and sex (DOTS and non-DOTS cases). Rates are missing where the breakdown of smear-positive notified cases is not provided, or where age-specific and sex-specific population data are not available. In the regional summary table, rates are calculated excluding those countries for which the breakdown of notified cases or population by age and sex is missing.

TABLE A3.13 **TB case notifications, 1980–2007**

TABLE A3.14 **TB case notification rates, 1980–2007**

TABLE A3.15 **New smear-positive cases notified, 1993–2007**

TABLE A3.16 **NTP budgets, available funding, cost of utilization of general health-care services and total TB control costs (US$ millions), 2009**

Notes

These notes include data provided to WHO in non-standard formats, additional information reported by countries and other observations.

SUMMARY BY WHO REGION

Table A3.1 **Methods of estimates**

Methods are presented by country (see regional sections of this annex). There is no regional summary for this table.

Table A3.2 **Estimated burden of TB, 1990 and 2007**

	Incidence, 1990				Prevalence, 1990		TB mortality, 1990		Incidence, 2007								Prevalence, 2007				TB mortality, 2007				HIV prevalence	MDR, 2007			
	All forms*		Smear-positive*		All forms*		All forms*		All forms*		All forms HIV+		Smear-positive*		Smear-positive HIV+		All forms*		All forms HIV+		All forms*		All forms HIV+		in incident TB	Percentage of		Number among	
	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	cases, 2007 (%)	new	re-treat	All cases	Smear-positive
AFR	860 042	168	373 360	73	1 654 085	324	232 149	45	2 879 434	363	1 080 328	136	1 187 713	150	378 115	48	3 766 069	475	540 164	68	734 891	93	377 535	48	38	2	8	75 657	45 029
AMR	415 623	57	223 876	31	598 017	82	57 395	8	294 636	32	33 356	4	157 225	17	14 845	2	348 043	38	16 678	2	40 616	4	7 892	< 1	11	2	14	10 214	7 261
EMR	419 455	110	186 491	49	868 989	227	99 510	26	582 767	105	20 517	4	258 877	47	7 179	1	772 039	139	10 258	2	104 300	19	7 726	1	3.5	3	27	23 049	14 120
EUR	318 540	37	143 062	17	439 626	52	43 963	5	431 518	49	42 322	5	189 951	21	14 813	2	455 580	51	21 161	2	63 765	7	8 096	< 1	9.8	10	43	92 554	67 440
SEAR	2 646 286	202	1 189 326	91	7 242 230	554	689 251	53	3 165 139	181	146 042	8	1 409 708	81	51 115	3	4 880 642	280	73 021	4	537 616	31	40 465	2	4.6	3	18	173 660	124 826
WPR	1 954 134	129	878 939	58	4 842 675	320	397 633	26	1 919 306	108	51 483	3	858 539	48	18 019	1	3 500 160	197	25 741	1	290 546	16	14 503	< 1	2.7	4	24	135 411	89 926
Global	**6 614 081**	**125**	**2 995 054**	**57**	**15 645 621**	**296**	**1 519 900**	**29**	**9 272 799**	**139**	**1 374 048**	**21**	**4 062 013**	**61**	**484 085**	**7**	**13 722 534**	**206**	**687 024**	**10**	**1 771 733**	**27**	**456 218**	**7**	**15**	**3**	**19**	**510 545**	**348 602**

* Incidence, prevalence and mortality estimates include patients with HIV. Estimates labelled "HIV+" are estimates of HIV+ TB cases in all people. Estimates for all years are re-calculated as new information becomes available and techniques are refined, so they may differ from those published previously. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.3 **Estimated incidence of TB (all forms) in all people, 1990–2007**

	Number of cases																		Rate (per 100 000 population)																	
	1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
AFR	860 042	962 684	1 049 154	1 144 912	1 244 488	1 354 099	1 457 871	1 593 492	1 747 230	1 926 456	2 135 150	2 347 968	2 557 357	2 725 652	2 824 866	2 863 387	2 870 765	2 879 434	168	183	194	206	218	230	242	257	275	296	319	343	364	379	383	379	371	363
AMR	415 623	408 987	401 292	393 343	384 962	376 797	368 617	360 528	352 823	345 176	338 008	330 965	324 415	318 006	311 897	306 017	300 239	294 636	57	55	54	52	50	48	46	45	43	42	40	39	38	37	35	34	33	32
EMR	419 455	429 421	442 594	451 118	462 914	473 393	483 201	489 400	497 708	507 006	516 769	525 495	533 979	542 116	550 322	560 010	571 155	582 767	110	109	110	109	109	109	109	108	107	107	107	106	106	106	105	105	105	105
EUR	318 540	308 459	314 704	326 181	341 420	363 185	389 505	409 910	428 724	437 374	445 657	445 527	440 916	435 397	432 139	432 704	432 102	431 518	37	36	37	38	40	42	45	47	49	50	51	51	50	49	49	49	49	49
SEAR	2 646 286	2 679 787	2 713 371	2 746 866	2 780 040	2 812 714	2 844 806	2 876 331	2 907 313	2 937 815	2 967 878	2 997 483	3 026 592	3 055 214	3 083 367	3 111 072	3 138 330	3 165 139	202	201	199	198	196	195	194	192	191	190	189	188	187	185	184	183	182	181
WPR	1 954 134	1 953 163	1 952 822	1 949 018	1 949 523	1 948 576	1 949 824	1 950 655	1 949 201	1 944 776	1 942 425	1 939 819	1 940 021	1 934 413	1 930 914	1 927 186	1 923 413	1 919 306	129	127	126	124	123	121	120	119	118	116	115	114	113	112	111	110	109	108
Global	**6 614 081**	**6 742 501**	**6 873 937**	**7 011 438**	**7 163 347**	**7 328 763**	**7 493 825**	**7 680 316**	**7 883 001**	**8 098 603**	**8 345 888**	**8 587 256**	**8 823 280**	**9 010 797**	**9 133 506**	**9 200 376**	**9 236 004**	**9 272 799**	**125**	**125**	**126**	**126**	**127**	**128**	**129**	**131**	**132**	**134**	**136**	**138**	**141**	**142**	**142**	**141**	**140**	**139**

Estimates for all years are re-calculated as new information becomes available and techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.4 **Estimated incidence, prevalence and mortality rates (per 100 000 population), 2000–2007**

	Incidence of HIV+ TB cases								Prevalence of TB (all forms)								Mortality (excluding HIV+)								Mortality HIV+							
	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
AFR	123	133	142	148	149	145	141	136	436	461	480	497	501	500	487	475	41	43	45	47	47	47	46	45	49	52	51	53	53	53	49	48
AMR	4	4	4	4	4	4	4	4	51	50	48	46	43	41	38	38	5	5	5	4	4	4	4	4	1	1	< 1	< 1	< 1	< 1	< 1	< 1
EMR	3	3	3	3	3	3	4	4	203	200	187	181	172	159	150	139	24	23	22	22	21	20	19	17	1	1	1	1	1	1	1	1
EUR	2	2	3	4	4	4	5	5	68	67	63	62	60	55	52	51	7	7	7	7	7	6	6	6	< 1	< 1	< 1	1	1	< 1	< 1	< 1
SEAR	9	9	9	9	9	9	9	8	417	390	370	337	309	296	286	280	42	40	38	35	32	30	29	28	4	4	4	3	3	3	2	2
WPR	2	2	2	3	3	3	3	3	260	255	250	235	218	207	201	197	20	20	19	18	17	16	16	16	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Global	**17**	**19**	**20**	**21**	**21**	**21**	**21**	**21**	**259**	**254**	**248**	**237**	**225**	**217**	**210**	**206**	**24**	**24**	**23**	**23**	**22**	**21**	**20**	**20**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**

Rates are per 100 000 population (total country population, including HIV-positive and HIV-negative people). Estimates for all years are re-calculated as new information becomes available and techniques are refined, so they may differ from those published previously. Data (including for years 1990 to 1999) can be downloaded from www.who.int/tb

Table A3.5 **Case notifications and case detection rates, DOTS and non-DOTS combined, 2007**

	Notified TB cases, DOTS and non-DOTS combined															Estimated incidence and case detection rates				Proportions			
					New pulmonary			New extra-	Other	Re-treatment cases					New pulm.	Estimated incidence		Case detection rate		ss+	ss+	Extrapulm.	Re-treat.
	Population	All notified	New and relapse		ss+		ss- / unk.	pulmonary	new	Relapse	After failure	After default	Other re-treat.	Other	lab. confirm.	all forms	ss+	all new	new ss+	(% of	(% of	(% of	(% of
	thousands	number	number	rate	number	rate	number	number	number	number	number	number	number	number	number	number	number	%	%	pulm.)	new+relapse)	new+relapse)	new+re-treat.)
AFR	792 378	1 326 692	1 251 735	158	561 149	71	408 964	223 322	1 184	57 116	12 086	16 908	45 171	792	668 500	2 879 434	1 187 713	41	47	58	45	18	10
AMR	909 820	230 175	218 426	24	119 838	13	55 041	32 564	990	9 993	1 346	4 304	5 395	704	125 098	294 636	157 225	71	76	69	55	15	9
EMR	555 064	383 364	378 895	68	155 572	28	136 865	76 898	0	9 560	1 638	2 652	48	131	262 337	582 767	258 877	63	60	53	41	20	4
EUR	889 278	478 299	350 529	39	105 288	12	165 777	53 623	0	25 841	4 887	4 150	118 317	416	141 324	431 518	189 951	75	55	39	30	15	32
SEAR	1 745 394	2 202 149	2 007 193	115	972 441	56	622 795	295 866	798	115 293	23 131	80 523	91 082	220	930 587	3 165 139	1 409 708	60	69	61	48	15	14
WPR	1 776 440	1 446 866	1 365 284	77	666 412	38	548 024	88 538	8	62 302	4 033	4 450	68 661	4 438	631 675	1 919 306	858 539	68	78	55	49	6	10
Global	**6 668 374**	**6 067 545**	**5 572 062**	**84**	**2 580 700**	**39**	**1 937 466**	**770811**	**2980**	**280 105**	**47 121**	**112 987**	**328 674**	**6 701**	**2 759 521**	**9 272 799**	**4 062 013**	**57**	**64**	**57**	**46**	**14**	**13**

ss+ indicates sputum smear-positive; ss-, sputum smear-negative; unk., sputum smear result unknown; re-treat., re-treatment; pulm. lab. confirmed, pulmonary case confirmed by positive smear or culture. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.6 **DOTS coverage, case notifications and case detection rates, 2007**

	TB cases reported from DOTS services															Estimated incidence and case detection rate				Proportions			
	DOTS				New pulmonary			New extra-	Other	Re-treatment cases					New pulm.	Estimated incidence		DOTS case detection rate		ss+	ss+	Extrapulm.	Re-treat.
	coverage	New and relapse			ss+		ss- / unk.	pulmonary	new	Relapse	After failure	After default	Other re-treat.	Other	lab. confirm.	all forms	ss+	all new	new ss+	(% of	(% of	(% of	(% of
	%	number	rate		number	rate	number	number	number	number	number	number	number	number	number	number	number	%	%	pulm.)	new+relapse)	new+relapse)	new+re-treat.)
AFR	93	1 251 642	158		561 091	71	408 936	223 320	1 184	57 111	12 086	16 908	45 171	792	668 442	2 879 434	1 187 713	41	47	58	45	18	10
AMR	91	208 419	23		114 307	13	52 053	31 389	986	9 684	1 327	4 059	5 076	688	119 082	294 636	157 225	67	73	69	55	15	9
EMR	97	375 857	68		155 558	28	135 441	75 299	0	9 559	1 638	2 652	48	131	261 551	582 767	258 877	63	60	53	41	20	4
EUR	75	322 132	36		97 156	11	154 365	45 094	0	25 517	4 602	4 032	113 302	57	127 865	431 518	189 951	69	51	39	30	14	33
SEAR	100	2 007 111	115		972 390	56	622 776	295 857	798	115 290	23 131	80 520	91 082	218	930 536	3 165 139	1 409 708	60	69	61	48	15	14
WPR	100	1 325 173	75		656 883	37	529 296	78 479	8	60 507	3 832	4 161	65 012	951	616 335	1 919 306	858 539	66	77	55	50	6	10
Global	**94**	**5 490 334**	**82**		**2 557 385**	**38**	**1 902 867**	**749 438**	**2 976**	**277 668**	**46 616**	**112 332**	**319 691**	**2 837**	**2 723 811**	**9 272 799**	**4 062 013**	**56**	**63**	**57**	**47**	**14**	**13**

ss+ indicates sputum smear-positive; ss-, sputum smear-negative; unk., sputum smear result unknown; re-treat., re-treatment; pulm. lab. confirmed, pulmonary case confirmed by positive smear or culture. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.7 **Laboratory services, collaborative TB/HIV activities and management of MDR-TB, 2006–2007**

	Laboratory services, 2007				Collaborative TB/HIV activities								Management of MDR-TB, 2007				
					2006				2007								
	Number of labs working with NTP			Smear labs	TB pts		HIV+	HIV+	TB pts		HIV+	HIV+					
	smear	culture	DST	included in EQA	tested for HIV	TB pts HIV-positive	TB pts CPT	TB pts ART	tested for HIV	TB pts HIV-positive	TB pts CPT	TB pts ART	Lab-confirmed MDR	DST in new cases	MDR in new cases	Re-treatment DST	Re-treatment MDR
AFR	8 547	110	45	4 466	285 826	147 406	137 760	53 262	491 755	250 546	186 941	76 547	8 772	523	47	7 043	709
AMR	13 874	1 487	111	9 040	94 578	13 885	96	8 997	113 559	14 619	879	9 259	2 522	13 061	532	4 183	1 839
EMR	4 094	162	36	2 158	3 657	275	58	126	4 160	477	102	272	486	2 216	87	938	377
EUR	6 744	2 216	762	284	191 698	5 339	275	1 184	169 397	6 710	405	138	16 062	76 601	7 351	22 228	8 572
SEAR	20 090	129	43	18 372	89 418	21 630	5 220	2 550	121 872	17 964	6 660	3 062	918	1 649	31	1 275	287
WPR	7 997	463	224	6 262	39 650	4 043	1 098	551	95 300	6 679	1 946	1 214	948	10 231	89	1 596	468
Global	**61 346**	**4 567**	**1 221**	**40 582**	**704 827**	**192 578**	**144 507**	**66 670**	**996 043**	**296 995**	**196 933**	**90 492**	**29 708**	**104 281**	**8 137**	**37 263**	**12 252**

ART indicates antiretroviral therapy; CPT, co-trimoxazole preventive therapy; DST, drug susceptibility testing; EQA, external quality assurance; HIV+, HIV-positive; pts, patients. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.8 **Treatment outcomes, 2006 cohort**

	New smear-positive cases, DOTS											New smear-positive cases, non-DOTS											Smear-positive re-treatment cases, DOTS									
			%	% of cohort							%			%	% of cohort							%				% of cohort						%
	Number of cases		of notif		Compl-				Trans-	Not		Number of cases		of notif		Compl-				Trans-	Not		Number		Compl-				Trans-	Not	
	Notified	Regist'd	regist'd	Cured	eted	Died	Failed	Default	ferred	eval.	Success	Notified	Regist'd	regist'd	Cured	eted	Died	Failed	Default	ferred	eval.	Success	Regist'd	Cured	eted	Died	Failed	Default	ferred	eval.	Success
AFR	555 361	562 884	101	65	10	6	1	8	4	5	75	5 703	36	1	94	0	3	3	0	0	0	94	98 957	49	17	7	5	11	5	6	66
AMR	114 680	116 925	102	55	20	4	1	6	3	10	75	10 509	15 153	144	26	46	4	0	10	3	10	72	12 282	37	18	6	3	14	6	16	55
EMR	131 820	132 001	100	75	11	3	1	6	3	1	86	62	123	198	25	8	1	0	9	57	0	33	14 039	58	18	4	3	11	5	2	76
EUR	100 102	94 262	94	61	9	8	9	7	3	2	70	9 799	4 662	48	15	31	6	0	2	0	46	46	51 866	34	7	14	19	12	5	8	42
SEAR	938 572	937 764	100	84	4	4	2	5	1	0	87	65	0	0									290 910	47	25	7	4	14	2	0	72
WPR	662 273	663 261	100	89	3	2	1	1	3	1	92	8 970	346	4	4	3	6	1	2	2	82	8	96 159	80	6	3	3	2	5	1	87
Global	**2 502 808**	**2 507 097**	**100**	**78**	**6**	**4**	**2**	**5**	**3**	**2**	**85**	**35 108**	**20 320**	**58**	**23**	**42**	**5**	**0**	**8**	**3**	**20**	**65**	**564 213**	**52**	**18**	**7**	**6**	**11**	**3**	**2**	**70**

Not eval. indicates not evaluated (percentage of registered cases for which outcomes were not recorded); success, sum of cured and completed; cases regist'd, the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2006 is used as the denominator for calculating treatment outcomes unless it is less than the sum of outcomes, in which case the sum of outcomes is used. If the number of cases registered is not reported, then the number of cases notified in 2006 is used, or the sum of outcomes if the latter is greater. Data can be downloaded from www.who.int/tb

Table A3.9 **DOTS re-treatment outcomes, 2006 cohort**

	Relapse, DOTS									After failure, DOTS									After default, DOTS								
		% of cohort									% of cohort									% of cohort							
	Number regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	% Success	Number regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	% Success	Number regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	% Success
AFR	44 530	60	7	7	8	12	5	1	66	3 798	50	12	9	8	13	5	3	62	9 409	56	18	5	4	7	6	5	74
AMR	5 851	50	14	5	3	9	5	14	64	410	20	8	7	18	8	6	33	27	2 699	27	14	6	2	26	9	16	41
EMR	8 193	67	11	4	3	8	4	2	78	1 322	50	22	6	7	9	6	0	72	2 435	44	23	4	4	21	4	0	67
EUR	19 893	46	8	12	15	10	5	4	54	3 927	27	9	13	22	10	3	15	37	6 285	27	9	15	17	19	5	8	36
SEAR	108 887	67	7	7	5	12	2	0	74	23 308	52	8	8	14	16	2	0	60	78 994	58	8	8	4	19	2	0	66
WPR	60 180	82	6	3	3	2	5	1	87	1 341	58	11	6	13	6	4	2	69	1 010	50	16	7	2	11	5	8	66
Global	**247 534**	**67**	**7**	**6**	**6**	**9**	**3**	**1**	**74**	**34 106**	**49**	**9**	**9**	**14**	**14**	**3**	**3**	**58**	**100 832**	**55**	**10**	**8**	**5**	**18**	**3**	**1**	**64**

Not eval. indicates not evaluated (percentage of registered cases for which outcomes were not recorded); success, sum of cured and completed; cases regist'd, the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2006 is used as the denominator for calculating treatment outcomes unless it is less than the sum of outcomes, in which case the sum of outcomes is used. If the number of cases registered is not reported, then the number of cases notified in 2006 is used, or the sum of outcomes if the latter is greater. Data can be downloaded from www.who.int/tb

Table A3.10 **DOTS treatment success and case detection rates, 1994–2007**

	DOTS new smear-positive treatment success (%)													DOTS new smear-positive case detection rate (%)												
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
AFR	59	62	57	63	70	69	72	71	73	73	74	76	75	23	26	30	35	37	36	37	43	45	46	46	47	47
AMR	76	78	83	82	81	83	81	82	83	83	82	78	75	26	26	29	33	36	43	42	45	49	57	62	72	73
EMR	82	87	86	79	77	83	83	83	84	83	83	83	86	12	10	12	19	21	25	27	32	34	39	46	52	60
EUR	68	69	72	72	76	77	77	75	76	75	74	71	70	3	3	5	11	11	12	14	22	24	26	37	53	51
SEAR	80	74	77	72	72	73	83	84	85	85	87	87	87	1	4	5	8	14	18	26	33	44	55	62	67	69
WPR	90	91	93	93	95	94	92	93	90	91	91	92	92	15	28	31	33	31	37	38	39	50	65	77	77	77
Global	**77**	**79**	**77**	**79**	**81**	**80**	**82**	**82**	**82**	**83**	**84**	**85**	**85**	**11**	**16**	**18**	**22**	**25**	**28**	**32**	**37**	**44**	**52**	**58**	**62**	**63**

Treatment success, sum of cured and completed; DOTS new smear-positive case detection rate, notified new smear-positive cases divided by estimated incident cases. Figures for all years are updated as new information becomes available and/or techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.11 **New smear-positive case notification by age and sex, DOTS and non-DOTS, 2007**

	Male							Female							All							Male/female ratio
	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+	
AFR	7 653	54 179	96 884	71 030	43 074	20 597	12 850	10 102	56 594	77 008	43 857	24 129	12 281	7 431	17 755	110 773	173 892	114 887	67 203	32 878	20 281	1.3
AMR	1 603	15 093	16 030	13 556	12 060	7 781	7 805	1 719	11 479	10 501	7 248	5 630	3 707	4 819	3 322	26 572	26 531	20 804	17 690	11 488	12 624	1.6
EMR	1 814	17 813	18 750	14 386	12 446	9 771	8 472	3 735	18 893	15 998	12 044	9 003	6 743	5 333	5 549	36 706	34 748	26 430	21 449	16 514	13 805	1.2
EUR	232	9 925	18 862	19 472	19 874	8 897	6 577	353	7 100	8 888	5 975	4 444	2 469	4 813	585	17 025	27 750	25 447	24 318	11 366	11 390	2.5
SEAR	6 371	108 306	132 549	137 108	123 134	89 066	56 505	10 144	78 671	81 784	60 475	43 330	28 955	16 092	16 515	186 977	214 333	197 583	166 464	118 021	72 597	2.0
WPR	1 726	59 827	71 557	85 284	83 198	75 836	91 686	2 102	39 574	37 234	34 619	28 916	26 189	33 688	3 828	99 401	108 791	119 903	112 114	102 025	125 374	2.3
Global	**19 399**	**265 143**	**354 632**	**340 836**	**293 786**	**211 948**	**183 895**	**28 155**	**212 311**	**231 413**	**164 218**	**115 452**	**80 344**	**72 176**	**47 554**	**477 454**	**586 045**	**505 054**	**409 238**	**292 292**	**256 071**	**1.8**

For some countries, breakdown of notified cases by age and sex is missing, or is provided for a subset of cases. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.12 **New smear-positive case notification rates by age and sex, DOTS and non-DOTS, 2007**

	Male							Female							All						
	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+
AFR	4	66	171	195	179	142	117	6	70	137	119	94	74	53	5	68	154	157	135	106	81
AMR	1	20	23	22	23	22	23	1	15	15	12	10	10	11	1	17	19	17	16	16	16
EMR	2	29	41	45	54	75	82	4	32	38	40	42	51	47	3	31	39	43	48	63	64
EUR	0	15	29	30	33	21	13	0	11	14	9	7	5	6	0	13	21	20	20	12	9
SEAR	2	63	92	120	141	170	133	4	49	60	55	52	55	33	3	56	77	88	98	112	79
WPR	1	39	51	56	74	96	130	1	28	28	24	27	34	41	1	34	40	40	51	66	83
Global	**2**	**43**	**68**	**74**	**82**	**89**	**84**	**3**	**37**	**46**	**36**	**32**	**33**	**26**	**3**	**40**	**58**	**55**	**57**	**60**	**52**

Rates are per 100 000 population of each age/sex group. Rates are calculated excluding those countries for which breakdown of notified cases or population by age and sex is missing. Data can be downloaded from www.who.int/tb

Table A3.13 **TB case notifications, 1980–2007**

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
AFR	219 802	224 102	240 263	258 842	264 928	296 627	301 683	333 842	373 550	365 432	418 530	412 414	432 997	418 995	550 183	504 309	585 773	598 821	689 253	750 086	783 930	861 423	1 004 557	1 079 333	1 179 378	1 186 800	1 243 560	1 251 735
AMR	227 697	248 122	237 274	238 465	226 812	227 186	227 206	233 192	241 834	239 594	231 186	252 215	253 255	166 458	241 854	258 188	256 656	254 980	262 886	240 619	238 580	230 403	233 678	228 448	235 511	227 599	224 687	218 426
EMR	522 110	514 791	433 271	234 482	171 652	186 344	230 427	288 805	280 126	261 441	234 620	315 483	109 087	201 620	119 374	121 745	145 373	136 232	233 878	171 734	141 748	165 904	191 744	207 375	235 943	287 352	322 306	378 895
EUR	348 921	346 104	324 580	319 220	308 401	298 933	302 602	290 606	277 143	267 232	242 429	231 651	248 519	242 425	243 691	290 031	322 080	353 361	349 795	373 765	373 081	368 433	373 670	358 978	354 954	365 346	359 735	350 529
SEAR	837 901	915 952	1 076 211	1 244 819	1 275 299	1 323 509	1 413 418	1 520 444	1 667 348	1 735 860	1 719 365	1 747 252	1 322 709	1 287 176	1 298 759	1 401 096	1 470 352	1 308 981	1 279 041	1 464 312	1 414 228	1 414 141	1 488 126	1 551 516	1 686 681	1 789 186	1 920 644	2 007 193
WPR	356 452	355 337	461 550	462 181	540 985	615 153	651 840	655 006	716 427	741 913	894 073	760 863	754 463	718 783	724 290	824 954	873 425	870 920	834 599	820 469	786 285	805 105	811 482	980 890	1 160 130	1 274 124	1 331 512	1 365 284
Global	2 512 883	2 604 408	2 773 149	2 758 009	2 788 077	2 947 752	3 127 176	3 321 895	3 556 428	3 611 472	3 740 203	3 719 878	3 121 030	3 035 457	3 178 151	3 400 323	3 653 659	3 523 295	3 649 452	3 820 985	3 737 852	3 845 409	4 103 257	4 406 540	4 852 597	5 130 407	5 402 444	5 572 062
Number reporting	195	194	194	196	193	198	197	199	201	197	196	192	187	179	178	191	196	193	199	196	196	195	206	204	202	199	203	196
% reporting	92	92	92	93	91	94	93	94	95	93	93	91	89	85	84	91	93	91	94	93	93	92	98	97	96	94	96	93

From 1995 on, number shown is all notified new and relapse cases (DOTS and non-DOTS). Figures for all years are updated as new information becomes available, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.14 **TB case notification rates, 1980–2007**

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
AFR	58	57	60	62	62	67	66	71	78	74	82	78	80	75	96	86	97	97	108	115	117	126	143	150	160	157	161	158
AMR	37	39	37	37	34	34	33	34	34	33	32	34	34	22	31	33	32	32	32	29	28	27	27	26	27	26	25	24
EMR	184	176	144	75	53	56	67	82	77	70	61	80	27	49	28	28	33	30	50	36	29	34	38	40	45	54	59	68
EUR	44	43	40	39	38	36	36	35	33	32	29	27	29	28	28	33	37	41	40	43	43	42	43	41	40	41	41	39
SEAR	79	85	97	110	110	112	117	124	133	135	131	131	97	93	92	97	100	88	84	95	90	89	92	94	101	105	112	115
WPR	27	27	34	34	39	44	46	45	49	50	59	50	49	46	46	51	54	53	50	49	47	47	47	57	67	73	75	77
Global	**56**	**58**	**60**	**59**	**58**	**61**	**63**	**66**	**70**	**69**	**71**	**69**	**57**	**55**	**56**	**59**	**63**	**60**	**61**	**63**	**61**	**62**	**65**	**69**	**75**	**79**	**82**	**84**

Rates are per 100 000 population. From 1995 on, number shown is notification rate of new and relapse cases. Figures for all years are updated as new information becomes available and/or techniques are refined, so they may differ from those published previously.
Data can be downloaded from www.who.int/tb

Table A3.15 **New smear-positive cases notified, 1990–2007**

	Number of cases																		Rate (per 100 000 population)																					
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
AFR	22 654	23 067	25 840	107 012	121 005	212 910	264 659	277 591	326 831	349 142	362 527	402 431	459 983	513 029	551 031	550 001	561 064	561 149	4	4	5	19	21	36	44	45	51	54	54	59	65	71	75	73	73	71
AMR	1 542	1 486	1 368	98 265	137 645	138 932	136 987	142 556	139 253	135 153	131 294	129 944	127 575	125 815	126 345	124 810	125 189	119 838	< 1	< 1	< 1	13	18	18	17	18	17	16	16	15	15	14	14	14	14	13
EMR	1 587	1 512	2 304	20 260	20 428	46 851	58 720	57 947	74 923	69 140	60 959	69 101	76 125	81 313	94 775	113 864	131 882	155 572	< 1	< 1	< 1	5	5	11	13	13	16	15	13	14	15	16	18	21	24	28
EUR				45 771	83 568	104 444	110 614	106 700	111 772	89 199	94 275	86 239	83 455	101 657	92 233	96 101	109 901	105 288				5	10	12	13	12	13	10	11	10	9	12	10	11	12	12
SEAR	2 769	3 023	3 218	317 355	313 430	357 882	372 867	369 583	382 171	481 332	510 053	561 939	606 730	673 171	779 530	857 371	938 637	972 441	< 1	< 1	< 1	23	22	25	25	25	25	31	32	35	37	41	47	51	55	56
WPR	84	76	81	222 813	241 737	314 271	388 142	416 954	379 698	383 613	376 109	371 806	372 528	453 812	579 566	671 612	671 243	666 412	< 1	< 1	< 1	14	15	20	24	25	23	23	22	22	22	26	33	38	38	38
Global	**28 636**	**29 164**	**32 811**	**811 476**	**917 813**	**1 175 290**	**1 331 989**	**1 371 331**	**1 414 648**	**1 507 579**	**1 535 217**	**1 621 460**	**1 726 396**	**1 948 797**	**2 223 480**	**2 413 759**	**2 537 916**	**2 580 700**	**20**	**20**	**21**	**19**	**19**	**21**	**24**	**24**	**24**	**25**	**25**	**26**	**28**	**31**	**35**	**37**	**39**	**39**

Rates are per 100 000 population. Figures for all years are updated as new information becomes available and/or techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.16 **NTP budgets, available funding, cost of utilization of general health-care services and total TB control costs (US$ millions), 2009**

		Available funding							
	NTP budget	Government (excluding loans)	Loans	Grants (excluding Global Fund)	Global Fund	Funding gap	Cost of utilization of general health-care services	Total TB control costs	Completeness of budget data
AFR	371	60	1	46	97	158	333	704	59
AMR	417	180	2	21	21	44	70	487	39
EMR	151	60	0	19	28	52	25	176	64
EUR	1921	1328	0	9	35	555	986	2907	31
SEAR	289	107	38	29	49	70	59	348	91
WPR	308	202	11	7	70	19	261	570	47
Global	**3 457**	**1 936**	**52**	**129**	**299**	**898**	**1 735**	**5 191**	**48**

Completeness of budget data indicates percentage of countries providing complete financial data. Data can be downloaded from www.who.int/tb

AFRICA

Africa

NTP MANAGER (OR EQUIVALENT) AND/OR PERSON(S) RESPONSIBLE FOR COMPLETING DATA COLLECTION FORM	
Algeria	Sofiane Alihalassa
Angola	Maria da Conceição Palma; Celestino Teixeira
Benin	
Botswana	Grace Kangwagye Nkubito
Burkina Faso	Sary Mathurin Dembélé; Tandaogo Saouadogo
Burundi	Donatien Nkurunziza; Damas Ntisigana
Cameroon	Tsala François Ottou; Adolphe Nkou Bikoe
Cape Verde	Maria da Luz Lima
Central African Republic	
Chad	Oumar Abdelhadi
Comoros	
Congo	Ongouo hermann; Antoine Ngoulou
Côte d'Ivoire	Jacquemin Kouakou; Aicha Diakite
DR Congo	André Ndongosieme
Equatorial Guinea	
Eritrea	Mineab Sebhatu
Ethiopia	Bekele Chaka; Azmera Molla
Gabon	Toung Mve Médard; Géneviève Angue Nguema
Gambia	Adama Jallow; Kejaw Saidykhan
Ghana	Frank Adae Bonsu
Guinea	Namory Keita; Fodé Cissé
Guinea-Bissau	
Kenya	Joseph Kimagut Sitienei; Hillary Kipruto; Joel Kangangi
Lesotho	Llaang Maama; Tseliso Malata
Liberia	
Madagascar	Martin Rakotonjanahary; Rarivoson Benjamin
Malawi	Ibrahim Idana; Felix Salaniponi; John Kwanjana
Mali	Diallo Alimata Naco
Mauritania	Sidina Ould Mohamed Ahmed; Mohamed Ould Salem
Mauritius	F. Rujeedawa
Mozambique	Paula Samogudo; Roberta Pastore; Zaina Cuna
Namibia	Rosalia Indongo
Niger	Marafa Boulacar; Moumouni Kadi
Nigeria	M. Kabir; Osahon Jeremie I. Ogbeiwi
Rwanda	Michel Gasana; Evariste Gasana
Sao Tome & Principe	Aleixo Rodrigues de Sousa Pires
Senegal	Mame Bocar Lo; Awa Héléne Diop
Seychelles	
Sierra Leone	Foday Dafae; Saffa Kamara
South Africa	Lindiwe Mvusi; Omphemetse Mokgatlhe; Letta Seshoka
Swaziland	Themba Dlamini; Thabo Hlophe
Togo	Fantchè Awokou
Uganda	Francis Adatu-Engwau; Joseph Imoko
UR Tanzania	Saidi Egwaga; Emmanuel Nkiligi
Zambia	Nathan Kapata; M. Maboshe
Zimbabwe	Charles Sandy; Nicholas Siziba

This list shows the people named on the data collection form sent to WHO in 2008, not necessarily the current NTP manager. It is intended as an acknowledgement rather than a directory.

Table A3.1 **Methods and assumptions for estimation of TB incidence, prevalence and mortality, Africa**

	Reference year	Incidence est. based on	Trend	Source of estimates			Cfr ss+ HIV-		Duration ss+HIV-		Duration ss-HIV-	
				TB/HIV	MDR (new)	MDR (re-treat)	DOTS	non-DOTS	DOTS	non-DOTS	DOTS	non-DOTS
Algeria	1997	ARI	Country notifs, exp.	Indirect	DRS	Model	0.05	0.05	1	1	1	1
Angola	1997	Notif.	Group, exp.	Indirect	Model	Model	0.1	0.3	1	2.5	1	2.5
Benin	2000	ARI	Country notifs, exp.	Indirect	DRS	Model	0.1	0.3	1	2.5	1	2.5
Botswana	1997	Notif.	Group, moving ave.	Routine	DRS	DRS	0.1	0.3	1	2.5	1	2.5
Burkina Faso	1997	Notif.	Group, moving ave.	Routine	Model	Model	0.1	0.3	1	2.5	1	2.5
Burundi	1997	Notif.	Group, moving ave.	Indirect	Model	Model	0.1	0.3	1	2.5	1	2.5
Cameroon	1997	Notif.	Group, moving ave.	Routine	Model	Model	0.1	0.3	1	2.5	1	2.5
Cape Verde	1997	Notif.	Country notifs, exp.	–	Model	Model	0.1	0.3	1	2.5	1	2.5
Central African Republic	1997	Notif.	Group, moving ave.	Indirect	DRS	DRS	0.1	0.3	1	2.5	1	2.5
Chad	1997	Notif.	Group, moving ave.	Indirect	Model	Model	0.1	0.3	1	2.5	1	2.5
Comoros	1997	Notif.	Country notifs, exp.	Indirect	Model	Model	0.1	0.2	1	2.5	1	2.5
Congo	1997	Notif.	Group, moving ave.	Indirect	Model	Model	0.1	0.3	1	2.5	1	2.5
Côte d'Ivoire	1997	Notif.	Group, moving ave.	Routine	DRS	Model	0.1	0.3	1	2.5	1	2.5
DR Congo	1997	Notif.	Group, moving ave.	Survey	Model	Model	0.1	0.3	1	2.5	1	2.5
Equatorial Guinea	1997	Notif.	Group, moving ave.	Indirect	Model	Model	0.1	0.3	1	2.5	1	2.5
Eritrea	1997	Prev.	Group, exp.	Indirect	Model	Model	0.1	0.3	1	3.4	1	3.4
Ethiopia	1997	Notif.	Group, moving ave.	Indirect	DRS	DRS	0.1	0.3	1	2.5	1	2.5
Gabon	1997	Notif.	Country notifs, moving ave.	Indirect	Model	Model	0.1	0.3	1	2.5	1	2.5
Gambia	1997	Notif.	Group, exp.	Indirect	DRS	DRS	0.1	0.3	1	2.5	1	2.5
Ghana	1997	Notif.	Country notifs, exp.	Survey	Model	Model	0.1	0.3	1	2.5	1	2.5
Guinea	1997	Notif.	Country notifs, exp.	Indirect	DRS	DRS	0.1	0.3	1	2.5	1	2.5
Guinea-Bissau	1997	Notif.	Group, exp.	Indirect	Model	Model	0.1	0.3	1	2.5	1	2.5
Kenya	2006	Notif.	Country notifs, moving ave.	Routine	Model	Model	0.1	0.3	1	2.5	1	2.5
Lesotho	1997	Notif.	Country notifs, moving ave.	Indirect	DRS	DRS	0.1	0.3	1	2.5	1	2.5
Liberia	1997	Notif.	Group, exp.	Indirect	Model	Model	0.1	0.3	1	2.5	1	2.5
Madagascar	1997	Notif.	Country notifs, exp.	Indirect	DRS	DRS	0.1	0.3	1	2.5	1	2.5
Malawi	1997	Notif.	Country notifs, moving ave.	Routine	Model	Model	0.1	0.3	1	2.5	1	2.5
Mali	1997	Notif.	Country notifs, exp.	Indirect	Model	Model	0.1	0.3	1	2.5	1	2.5
Mauritania	1997	Notif.	Group, exp.	Indirect	Model	Model	0.1	0.3	1	2.5	1	2.5
Mauritius	2006	Notif.	Country notifs, exp.	Routine	Model	Model	0.1	0.2	1	2.5	1	2.5
Mozambique	2002	Notif.	Group, moving ave.	Routine	DRS	DRS	0.1	0.3	1	2.5	1	2.5
Namibia	1997	Notif.	Group, moving ave.	Indirect	Model	Model	0.1	0.3	1	2.5	1	2.5
Niger	1997	Notif.	Group, exp.	Indirect	Model	Model	0.1	0.3	1	2.5	1	2.5
Nigeria	1997	Notif.	Group, moving ave.	Indirect	Model	Model	0.1	0.3	1	2.5	1	2.5
Rwanda	1997	Notif.	Group, moving ave.	Routine	DRS	DRS	0.1	0.3	1	2.5	1	2.5
Sao Tome & Principe	1997	Notif.	Group, exp.	Routine	Model	Model	0.1	0.3	1	2.5	1	2.5
Senegal	1997	Notif.	Group, exp.	Indirect	DRS	DRS	0.1	0.3	1	2.5	1	2.5
Seychelles	1997	Notif.	Group, exp.	–	Model	Model	0.1	0.2	1	2.5	1	2.5
Sierra Leone	1997	Notif.	Country notifs, exp.	Indirect	DRS	DRS	0.1	0.3	1	2.5	1	2.5
South Africa	2001	Mort.	Country notifs, moving ave.	Indirect	DRS	DRS	0.1	0.3	1	2.5	1	2.5
Swaziland	1997	Notif.	Country notifs, moving ave.	Indirect	DRS	DRS	0.1	0.3	1	2.5	1	2.5
Togo	1997	Notif.	Group, exp.	Indirect	Model	Model	0.1	0.3	1	2.5	1	2.5
Uganda	1997	Notif.	Country notifs, moving ave.	Indirect	DRS	DRS	0.1	0.3	1	2.5	1	2.5
UR Tanzania	1997	Notif.	Country notifs, moving ave.	Routine	DRS	Model	0.1	0.3	1	2.5	1	2.5
Zambia	1997	Notif.	Country notifs, moving ave.	Routine	DRS	DRS	0.1	0.3	1	2.5	1	2.5
Zimbabwe	1997	Notif.	Group, moving ave.	Indirect	DRS	DRS	0.1	0.3	1	2.5	1	2.5

– indicates no estimate; ARI, annual risk of infection; ave, average; C-ReC., capture re-capture; CDR, case detection rate; DRS, drug resistance survey; exp., exponential; HIV+, HIV-positive; HIV-, HIV-negative; Mort., mortality (vital registration); Notif(s)., notification(s); Prev., disease prevalence survey; ss+, sputum smear-positive; ss-, sputum smear-negative. See Annex 2 (methods) for details. Data can be downloaded from www.who.int/tb

Table A3.2 **Estimated burden of TB, Africa, 1990 and 2007**

	Incidence, 1990				Prevalence, 1990		TB mortality, 1990		Incidence, 2007								Prevalence, 2007				TB mortality, 2007				HIV prevalence in incident TB cases (%)	MDR, 2007			
	All forms*		Smear-positive*		All forms*		All forms*		All forms*		All forms HIV+		Smear-positive*		Smear-positive HIV+		All forms*		All forms HIV+		All forms*		All forms HIV+			Percentage of		Number among	
	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate		new	re-treat	all cases	smear-positive
Algeria	9 490	38	4 270	17	11 253	45	542	2	19 156	57	429	1	8 577	25	150	< 1	18 942	56	215	< 1	700	2	21	< 1	2.2	1.2	10	287	164
Angola	21 634	205	9 676	92	54 122	514	6 296	60	48 777	287	9 089	53	21 041	124	3 181	19	50 105	294	4 544	27	5 684	33	1 926	11	19	1.8	9.2	1 919	1 416
Benin	3 963	77	1 777	34	7 250	140	771	15	8 206	91	1 296	14	3 563	39	454	5	12 222	135	648	7	1 643	18	519	6	16	0.3	10	102	88
Botswana	4 201	307	1 795	131	4 704	344	624	46	13 761	731	9 414	500	5 251	279	3 295	175	11 707	622	4 707	250	3 649	194	2 945	157	68	0.8	10	208	136
Burkina Faso	8 429	95	3 577	40	15 915	179	2 849	32	33 437	226	8 193	55	14 227	96	2 868	19	59 514	403	4 096	28	10 210	69	4 105	28	25	2.1	13	1 196	793
Burundi	8 776	154	3 815	67	16 413	288	2 441	43	31 225	367	6 187	73	13 432	158	2 166	25	55 040	647	3 094	36	8 685	102	2 923	34	20	2.3	9.4	820	402
Cameroon	9 856	81	4 345	35	23 039	188	2 944	24	35 556	192	15 349	83	14 465	78	5 372	29	36 088	195	7 675	41	7 159	39	4 434	24	43	1.7	8.3	825	457
Cape Verde	623	175	280	79	1 595	449	176	50	798	151	–	–	359	68	–	–	1 487	280	–	–	166	31	–	–	–	1.6	11	23	16
Central African Republic	4 360	145	1 896	63	9 558	318	1 404	47	14 985	345	6 318	145	6 111	141	2 211	51	18 464	425	3 159	73	4 330	100	2 681	62	42	1.1	18	422	326
Chad	7 671	125	3 407	56	15 369	251	1 889	31	32 203	299	8 837	82	13 608	126	3 093	29	53 618	497	4 419	41	9 690	90	4 178	39	27	1.9	10	869	507
Comoros	450	85	202	38	990	188	77	15	352	42	3	< 1	158	19	< 1	< 1	696	83	1	< 1	54	6	< 1	< 1	0.8	1.8	12	8	5
Congo	4 102	169	1 702	70	5 053	209	1 068	44	15 190	403	4 596	122	6 376	169	1 609	43	18 287	485	2 298	61	3 405	90	1 501	40	30	1.6	8.8	302	161
Côte d'Ivoire	22 577	177	9 671	76	37 280	292	6 171	48	80 995	420	31 423	163	33 306	173	10 998	57	112 028	582	15 712	82	24 722	128	14 088	73	39	2.5	8.7	2 427	1 235
DR Congo	62 433	165	27 715	73	104 481	275	13 311	35	245 333	392	14 431	23	108 957	174	5 051	8	417 066	666	7 216	12	51 102	82	6 000	10	5.9	2.3	10	7 336	4 137
Equatorial Guinea	365	108	161	47	573	169	65	19	1 299	256	373	74	547	108	131	26	2 382	469	187	37	442	87	200	39	29	–	–	–	–
Eritrea	2 272	72	1 019	32	7 750	245	633	20	4 629	95	739	15	2 009	41	259	5	6 495	134	369	8	793	16	144	3	16	2.2	9.4	123	67
Ethiopia	81 263	159	36 004	70	159 563	312	20 331	40	314 267	378	61 094	74	135 311	163	21 383	26	481 175	579	30 547	37	76 421	92	23 275	28	19	1.6	12	5 979	3 086
Gabon	1 408	153	623	68	3 294	359	420	46	5 408	406	2 257	170	2 208	166	790	59	5 045	379	1 129	85	1 011	76	542	41	42	1.4	8.2	118	74
Gambia	1 783	185	802	83	3 372	350	366	38	4 415	258	506	30	1 936	113	177	10	6 908	404	253	15	936	55	202	12	11	0.5	< 0.05	21	9
Ghana	34 713	223	15 606	100	82 975	533	9 242	59	47 632	203	7 409	32	20 694	88	2 593	11	82 928	353	3 705	16	12 138	52	3 337	14	16	1.9	10	1 121	619
Guinea	7 197	119	3 220	53	14 558	241	1 692	28	26 928	287	5 200	55	11 598	124	1 820	19	41 944	448	2 600	28	6 527	70	2 204	24	19	0.6	28	677	591
Guinea-Bissau	1 602	158	718	71	4 103	404	405	40	3 727	220	755	45	1 602	94	264	16	4 678	276	377	22	747	44	244	14	20	2.3	9.2	112	64
Kenya	26 256	112	10 783	46	29 421	125	5 957	25	132 357	353	63 345	169	53 226	142	22 171	59	119 842	319	31 672	84	24 435	65	14 588	39	48	1.9	7.9	3 532	2 016
Lesotho	2 945	184	1 305	81	3 596	225	446	28	12 782	637	9 653	481	4 787	238	3 379	168	11 410	568	4 827	240	5 282	263	4 542	226	76	0.9	5.7	208	136
Liberia	4 244	199	1 889	88	10 177	476	1 226	57	10 393	277	2 025	54	4 474	119	709	19	14 918	398	1 013	27	2 325	62	796	21	19	–	–	–	–
Madagascar	21 339	177	9 602	80	44 200	367	4 615	38	49 360	251	1 196	6	22 092	112	419	2	82 137	417	598	3	9 371	48	483	2	2.4	0.5	3.9	407	273
Malawi	24 371	258	10 400	110	35 906	380	5 829	62	48 144	346	32 791	235	18 386	132	11 477	82	42 447	305	16 396	118	14 167	102	11 293	81	68	2.3	7.5	1 555	872
Mali	21 082	275	9 439	123	49 098	640	5 671	74	39 345	319	6 840	55	17 021	138	2 394	19	73 931	599	3 420	28	11 142	90	3 412	28	17	2.0	11	1 162	717
Mauritania	4 429	228	1 993	102	11 371	585	1 219	63	9 923	318	1 065	34	4 359	140	373	12	17 471	559	533	17	2 353	75	466	15	11	–	–	–	–
Mauritius	293	28	132	12	562	53	50	5	282	22	18	1	125	10	6	< 1	494	39	9	< 1	48	4	6	< 1	6.5	1.3	10	5	3
Mozambique	24 543	181	10 853	80	38 910	287	4 979	37	92 295	431	43 676	204	37 165	174	15 287	71	107 752	504	21 838	102	27 200	127	17 480	82	47	3.5	3.3	3 394	1 464
Namibia	4 566	322	2 006	142	9 208	650	1 188	84	15 905	767	10 695	516	6 088	294	3 743	180	11 038	532	5 347	258	2 124	102	1 518	73	67	1.6	8.0	425	270
Niger	9 775	125	4 389	56	24 805	317	2 792	36	24 802	174	2 324	16	10 928	77	813	6	41 543	292	1 162	8	5 443	38	968	7	9.4	2.2	10	791	487
Nigeria	123 296	131	54 646	58	265 948	282	33 147	35	460 149	311	123 356	83	194 731	131	43 175	29	771 507	521	61 678	42	137 845	93	58 974	40	27	1.8	9.4	11 700	6 934
Rwanda	12 165	167	4 738	65	13 856	190	4 917	67	38 606	397	14 469	149	15 926	164	5 064	52	57 390	590	7 235	74	12 403	128	6 829	70	37	3.9	9.4	1 818	934
Sao Tome & Principe	157	135	71	61	402	346	44	38	159	101	–	–	72	45	–	–	378	240	–	–	42	26	–	–	–	–	–	–	–
Senegal	15 368	195	6 903	87	29 972	380	3 326	42	33 613	272	4 203	34	14 706	119	1 471	12	57 939	468	2 101	17	7 982	64	1 863	15	13	2.1	17	1 250	852
Seychelles	31	43	14	20	81	113	6	9	28	32	–	–	13	15	–	–	48	55	–	–	4	5	–	–	–	1.4	10	< 1	< 1
Sierra Leone	8 454	207	3 786	93	18 995	465	2 173	53	33 662	574	6 700	114	14 478	247	2 345	40	55 169	941	3 350	57	8 715	149	2 943	50	20	0.9	23	619	455
South Africa	109 968	301	48 592	133	281 228	769	28 592	78	460 600	948	335 598	691	173 710	358	117 459	242	335 911	692	167 799	345	111 924	230	93 702	193	73	1.8	6.7	15 914	10 708
Swaziland	2 310	267	1 019	118	5 438	629	684	79	13 674	1 198	10 980	962	5 055	443	3 843	337	9 266	812	5 490	481	3 619	317	3 160	277	80	0.9	9.1	226	148
Togo	12 185	308	5 404	136	27 797	702	3 475	88	28 263	429	7 970	121	11 921	181	2 789	42	49 358	750	3 985	61	9 058	138	4 071	62	28	2.0	10	757	423
Uganda	29 080	163	11 366	64	36 793	206	12 333	69	101 785	330	39 377	128	41 865	136	13 782	45	131 636	426	19 688	64	28 686	93	16 110	52	39	0.5	4.4	805	485
UR Tanzania	45 408	178	18 727	73	54 774	215	10 825	42	120 291	297	56 233	139	48 508	120	19 681	49	136 253	337	28 116	70	31 504	78	19 826	49	47	1.1	7.9	2 079	1 301
Zambia	24 152	297	9 590	118	35 402	436	10 228	126	60 337	506	41 954	352	22 956	193	14 684	123	46 115	387	20 977	176	13 661	115	10 624	89	70	1.8	2.3	1 249	577
Zimbabwe	34 456	329	13 433	128	42 936	409	14 710	140	104 400	782	71 961	539	39 784	298	25 186	189	95 298	714	35 980	270	35 343	265	28 409	213	69	1.9	8.3	2 863	1 620
AFR	**860 042**	**168**	**373 360**	**73**	**1 654 085**	**324**	**232 149**	**45**	**2 879 434**	**363**	**1 080 328**	**136**	**1 187 713**	**150**	**378 115**	**48**	**3 766 069**	**475**	**540 164**	**68**	**734 891**	**93**	**377 535**	**48**	**38**	**1.8**	**8.1**	**75 657**	**45 029**

– Indicates no estimate.

* Incidence, prevalence and mortality estimates include patients with HIV. Estimates labelled "HIV+" are estimates of HIV+ TB cases in all people. Estimates for all years are re-calculated as new information becomes available and techniques are refined, so they may differ from those published previously. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.3 **Estimated incidence of TB (all forms) in all people, Africa, 1990–2007**

	Number of cases																	
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Algeria	9 490	9 963	10 453	10 955	11 462	11 970	12 477	12 985	13 498	14 026	14 577	15 152	15 753	16 380	17 033	17 712	18 420	19 156
Angola	21 634	22 741	23 955	25 249	26 574	27 898	29 205	30 510	31 845	33 261	34 798	36 475	38 285	40 216	42 241	44 344	46 518	48 777
Benin	3 963	4 151	4 353	4 565	4 781	4 997	5 211	5 426	5 644	5 874	6 118	6 379	6 656	6 947	7 249	7 559	7 878	8 206
Botswana	4 201	4 793	5 267	5 801	6 347	6 948	7 506	8 235	9 059	9 998	11 071	12 141	13 134	13 852	14 149	14 142	13 952	13 761
Burkina Faso	8 429	9 618	10 579	11 674	12 813	14 091	15 309	16 911	18 765	20 947	23 529	26 256	28 976	31 214	32 560	33 190	33 338	33 437
Burundi	8 776	9 954	10 855	11 847	12 831	13 896	14 840	16 093	17 539	19 283	21 427	23 763	26 172	28 240	29 595	30 377	30 793	31 225
Cameroon	9 856	11 246	12 357	13 614	14 908	16 346	17 697	19 469	21 500	23 861	26 620	29 473	32 244	34 417	35 569	35 927	35 766	35 556
Cape Verde	623	633	642	652	663	673	683	692	702	712	722	733	744	755	766	777	788	798
Central African Republic	4 360	4 963	5 450	6 007	6 583	7 221	7 818	8 600	9 488	10 505	11 673	12 849	13 954	14 778	15 165	15 233	15 108	14 985
Chad	7 671	8 772	9 664	10 681	11 748	12 958	14 130	15 676	17 478	19 609	22 141	24 839	27 557	29 829	31 235	31 920	32 102	32 203
Comoros	450	444	438	432	427	421	415	410	404	399	393	388	382	376	370	364	358	352
Congo	4 102	4 678	5 141	5 668	6 216	6 830	7 416	8 188	9 077	10 107	11 305	12 538	13 732	14 667	15 165	15 327	15 268	15 190
Côte d'Ivoire	22 577	25 902	28 590	31 619	34 745	38 224	41 525	45 838	50 745	56 358	62 772	69 211	75 260	79 773	81 909	82 309	81 652	80 995
DR Congo	62 433	71 788	79 668	88 656	97 836	107 722	116 648	127 996	140 811	155 849	173 837	192 965	212 141	227 995	237 622	242 326	243 855	245 333
Equatorial Guinea	365	413	452	496	542	593	641	705	779	865	965	1 068	1 168	1 247	1 290	1 305	1 302	1 299
Eritrea	2 272	2 326	2 367	2 404	2 449	2 512	2 596	2 700	2 824	2 968	3 130	3 311	3 512	3 729	3 953	4 178	4 402	4 629
Ethiopia	81 263	93 143	102 890	113 990	125 506	138 315	150 439	166 228	184 301	205 283	229 766	255 109	279 806	299 420	310 363	314 615	314 563	314 267
Gabon	1 408	1 415	1 443	1 508	1 605	1 597	1 798	1 934	2 270	2 434	3 008	3 265	3 503	3 539	3 760	4 192	4 793	5 408
Gambia	1 783	1 888	1 999	2 115	2 238	2 368	2 505	2 648	2 799	2 956	3 118	3 287	3 461	3 641	3 827	4 018	4 214	4 415
Ghana	34 713	35 517	36 338	37 164	37 978	38 771	39 538	40 282	41 013	41 744	42 483	43 234	43 991	44 748	45 495	46 226	46 937	47 632
Guinea	7 197	7 881	8 651	9 495	10 389	11 314	12 259	13 229	14 233	15 289	16 412	17 612	18 891	20 261	21 736	23 330	25 056	26 928
Guinea-Bissau	1 602	1 685	1 774	1 870	1 969	2 070	2 173	2 279	2 388	2 503	2 627	2 760	2 902	3 053	3 211	3 376	3 548	3 727
Kenya	26 256	27 619	33 698	41 289	50 997	61 306	72 749	87 461	102 240	116 314	126 537	130 816	137 823	147 257	152 921	144 631	135 441	132 357
Lesotho	2 945	3 263	3 582	4 072	4 751	5 570	6 350	7 315	8 411	9 635	10 428	11 008	11 836	12 378	12 639	12 658	12 724	12 782
Liberia	4 244	4 266	4 279	4 322	4 448	4 696	5 098	5 642	6 269	6 885	7 420	7 838	8 159	8 434	8 750	9 172	9 726	10 393
Madagascar	21 339	22 422	23 565	24 772	26 045	27 386	28 801	30 289	31 852	33 487	35 194	36 974	38 829	40 762	42 779	44 882	47 076	49 360
Malawi	24 371	27 638	30 744	33 822	37 049	39 378	40 183	42 543	45 061	47 100	49 371	49 500	51 006	51 573	52 209	51 713	49 990	48 144
Mali	21 082	21 815	22 584	23 386	24 221	25 087	25 986	26 920	27 896	28 924	30 013	31 165	32 381	33 659	34 996	36 389	37 838	39 345
Mauritania	4 429	4 636	4 855	5 086	5 331	5 589	5 861	6 148	6 451	6 770	7 107	7 463	7 837	8 228	8 633	9 051	9 481	9 923
Mauritius	293	292	292	292	293	293	292	292	291	291	290	289	288	287	286	285	284	282
Mozambique	24 543	27 849	30 713	34 146	37 760	41 715	45 370	50 052	55 355	61 506	68 716	76 205	83 498	89 238	92 311	93 283	92 868	92 295
Namibia	4 566	5 250	5 794	6 396	7 014	7 707	8 368	9 234	10 220	11 343	12 619	13 888	15 067	15 925	16 296	16 312	16 111	15 905
Niger	9 775	10 302	10 867	11 470	12 114	12 799	13 529	14 306	15 129	15 996	16 909	17 868	18 876	19 937	21 056	22 237	23 485	24 802
Nigeria	123 296	140 688	154 662	170 544	187 013	205 460	222 998	246 072	272 605	303 464	339 454	376 658	412 846	441 419	457 037	462 603	461 640	460 149
Rwanda	12 165	13 027	13 041	12 918	12 945	13 592	14 920	17 368	20 647	24 435	28 421	32 063	35 189	37 326	38 304	38 610	38 573	38 606
Sao Tome & Principe	157	158	158	158	159	159	159	159	159	160	160	160	160	160	160	160	159	159
Senegal	15 368	16 123	16 903	17 713	18 556	19 436	20 356	21 316	22 318	23 367	24 465	25 613	26 815	28 068	29 375	30 734	32 146	33 613
Seychelles	31	31	31	31	30	30	30	30	30	30	30	29	29	29	29	29	28	28
Sierra Leone	8 454	9 060	9 645	10 232	10 860	11 568	12 371	13 276	14 322	15 563	17 045	18 828	20 931	23 303	25 836	28 431	31 035	33 662
South Africa	109 968	112 946	116 386	120 397	125 241	131 598	140 876	155 500	178 852	214 159	261 399	314 405	363 260	401 071	426 935	443 505	453 929	460 600
Swaziland	2 310	2 365	2 361	2 470	2 755	3 230	3 896	4 736	5 688	7 181	8 481	9 848	10 827	11 856	12 552	12 830	13 257	13 674
Togo	12 185	12 759	13 332	13 928	14 582	15 322	16 163	17 099	18 109	19 158	20 218	21 280	22 351	23 441	24 569	25 747	26 979	28 263
Uganda	29 080	46 176	52 113	58 808	62 850	67 739	68 811	72 157	75 857	77 621	83 984	91 598	101 471	107 400	107 802	107 001	104 528	101 785
UR Tanzania	45 408	51 686	57 990	64 563	72 318	81 159	89 157	96 910	102 366	107 855	114 827	120 263	125 247	125 842	126 389	124 868	122 692	120 291
Zambia	24 152	29 138	35 224	40 464	45 189	49 605	52 618	56 070	58 229	61 680	62 905	66 869	68 666	72 207	70 164	67 445	63 960	60 337
Zimbabwe	34 456	39 260	43 010	47 172	51 360	55 937	60 101	65 566	71 713	78 701	86 666	94 532	101 741	106 774	108 574	108 066	106 206	104 400
AFR	**860 042**	**962 684**	**1 049 154**	**1 144 912**	**1 244 488**	**1 354 099**	**1 457 871**	**1 593 492**	**1 747 230**	**1 926 456**	**2 135 150**	**2 347 968**	**2 557 357**	**2 725 652**	**2 824 866**	**2 863 387**	**2 870 765**	**2 879 434**

	Rate (per 100 000 population)																	
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Algeria	38	38	39	40	41	42	43	44	46	47	48	49	50	51	53	54	55	57
Angola	205	209	214	218	222	226	231	236	240	245	250	255	260	265	270	276	281	287
Benin	77	77	78	79	80	80	81	82	83	84	85	86	86	87	88	89	90	91
Botswana	307	341	364	390	415	444	468	503	542	588	640	692	740	772	780	770	751	731
Burkina Faso	95	105	112	120	128	137	145	155	168	182	198	214	229	239	241	238	232	226
Burundi	154	171	182	196	208	223	235	252	272	295	321	347	371	387	391	387	377	367
Cameroon	81	89	95	102	109	116	123	132	142	154	168	181	194	202	204	202	197	192
Cape Verde	175	174	172	171	169	168	166	165	163	162	160	159	157	156	155	153	152	151
Central African Republic	145	161	172	184	196	209	221	237	256	277	302	327	349	364	368	363	354	345
Chad	125	139	149	159	170	181	191	205	221	240	262	283	302	315	318	315	307	299
Comoros	85	82	79	75	72	69	67	64	61	59	56	54	52	50	48	46	44	42
Congo	169	188	200	215	229	245	258	277	299	324	353	382	408	425	430	425	414	403
Côte d'Ivoire	177	196	209	224	239	255	269	289	312	338	368	398	425	444	448	443	432	420
DR Congo	165	182	195	209	222	238	251	269	290	315	343	371	396	413	417	413	402	392
Equatorial Guinea	108	119	127	136	145	155	164	176	190	206	224	242	259	270	273	270	263	256
Eritrea	72	73	74	76	77	78	79	81	82	84	85	86	88	89	91	92	94	95
Ethiopia	159	176	188	201	215	229	242	260	280	304	331	358	383	399	403	398	388	378
Gabon	153	150	148	151	156	151	166	174	200	210	254	271	285	283	296	325	366	406
Gambia	185	189	193	196	200	204	208	212	217	221	225	230	234	239	244	248	253	258
Ghana	223	222	220	219	218	217	216	214	213	212	211	210	209	207	206	205	204	203
Guinea	119	126	132	139	147	154	163	171	180	190	200	211	222	234	246	259	273	287
Guinea-Bissau	158	161	164	167	170	174	177	181	184	188	192	195	199	203	207	211	216	220
Kenya	112	114	135	160	192	224	258	302	344	382	405	408	419	436	441	406	371	353
Lesotho	184	201	218	244	280	323	362	409	461	519	553	576	613	635	643	639	638	637
Liberia	199	203	207	211	215	219	223	228	232	237	242	246	251	256	261	266	272	277
Madagascar	177	181	185	189	192	196	200	205	209	213	217	222	226	231	236	241	246	251
Malawi	258	286	314	343	373	390	389	401	412	417	425	414	416	410	405	391	368	346
Mali	275	277	280	282	285	287	290	292	295	297	300	303	305	308	311	313	316	319
Mauritania	228	232	237	241	246	251	256	261	266	272	277	282	288	294	300	305	312	318
Mauritius	28	27	27	27	26	26	26	25	25	25	24	24	24	24	23	23	23	22
Mozambique	181	201	214	230	245	262	276	297	320	347	378	408	436	455	460	454	443	431
Namibia	322	357	381	409	435	465	491	527	568	616	671	726	776	809	817	808	787	767
Niger	125	127	130	133	135	138	141	143	146	149	152	155	158	161	164	168	171	174
Nigeria	131	145	155	166	176	188	199	214	230	250	272	294	314	328	331	327	319	311
Rwanda	167	185	197	212	225	241	254	273	294	319	348	376	402	419	423	418	408	397
Sao Tome & Principe	135	133	131	129	126	124	122	120	118	116	114	112	110	108	106	105	103	101
Senegal	195	198	202	206	211	215	219	223	228	232	237	241	246	251	256	261	266	272
Seychelles	43	43	42	41	40	40	39	38	38	37	37	36	35	35	34	33	33	32
Sierra Leone	207	220	233	248	263	279	297	315	334	355	377	400	425	451	479	509	540	574
South Africa	301	301	302	305	309	317	332	360	406	479	576	683	780	852	898	925	940	948
Swaziland	267	266	260	267	293	337	398	474	558	691	801	916	994	1 075	1 127	1 141	1 169	1 198
Togo	308	314	320	326	333	339	346	353	360	367	374	382	389	397	405	413	421	429
Uganda	163	250	272	296	306	319	314	320	326	324	340	360	386	396	385	370	350	330
UR Tanzania	178	196	213	229	249	271	290	308	317	327	339	346	352	344	337	325	311	297
Zambia	297	349	411	460	501	536	554	576	583	603	602	627	632	652	623	588	547	506
Zimbabwe	329	364	389	417	444	474	501	538	580	628	685	740	791	825	834	824	803	782
AFR	**168**	**183**	**194**	**206**	**218**	**230**	**242**	**257**	**275**	**296**	**319**	**343**	**364**	**379**	**383**	**379**	**371**	**363**

Estimates for all years are re-calculated as new information becomes available and techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.4 **Estimated incidence, prevalence and mortality rates (per 100 000 population), Africa, 2000–2007**

	Incidence of HIV+ TB cases								Prevalence of TB (all forms)								Mortality (excluding HIV+)								Mortality HIV+							
	2000	2001	2002	2003	2004	2005	2006	2007	2000	2001	2002	2003	2004	2005	2006	2007	2000	2001	2002	2003	2004	2005	2006	2007	2000	2001	2002	2003	2004	2005	2006	2007
Algeria	< 1	< 1	< 1	< 1	1	1	1	1	48	49	50	51	52	53	55	56	2	2	2	2	2	2	2	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Angola	34	37	41	44	47	49	51	53	530	335	307	281	318	331	302	294	57	36	23	21	25	26	22	22	18	12	11	9	12	13	7	11
Benin	13	13	14	14	14	14	14	14	128	129	137	139	134	135	134	135	12	12	13	13	13	13	12	12	5	6	6	6	6	6	6	6
Botswana	439	478	512	534	538	530	515	500	445	497	535	586	598	599	621	622	22	26	28	33	35	35	37	37	62	80	94	121	127	130	152	157
Burkina Faso	58	62	65	66	65	62	58	55	338	368	398	419	426	421	411	403	34	37	40	42	43	43	42	41	29	32	33	34	33	31	29	28
Burundi	101	103	104	102	96	89	80	73	455	522	581	619	639	654	657	647	46	53	60	64	66	68	69	68	41	45	46	46	43	41	38	34
Cameroon	77	83	88	91	91	89	86	83	228	241	240	227	228	213	201	195	20	21	21	19	19	16	16	15	36	38	37	34	33	28	26	24
Cape Verde	–	–	–	–	–	–	–	–	380	283	374	370	367	278	285	280	42	32	41	41	40	32	32	31	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Central African Republic	124	136	146	153	155	153	149	145	485	495	468	566	574	507	437	425	47	48	43	54	55	47	39	38	66	68	67	80	82	72	63	62
Chad	66	74	81	85	87	86	84	82	420	450	502	573	548	518	505	497	43	46	51	58	56	53	52	51	30	33	39	45	43	40	39	39
Comoros	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	112	103	104	107	99	91	86	83	8	8	8	8	7	7	7	6	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Congo	127	133	138	140	138	133	128	122	313	354	402	509	477	482	511	485	21	29	31	51	49	51	53	51	22	28	35	48	42	40	43	40
Côte d'Ivoire	179	190	199	202	197	187	175	163	472	571	561	590	604	613	597	582	42	52	51	54	56	57	56	55	83	99	94	94	91	88	80	73
DR Congo	20	21	23	24	24	24	24	23	592	643	697	708	710	702	692	666	65	70	76	77	77	76	75	72	8	9	10	10	10	10	10	10
Equatorial Guinea	65	71	77	80	81	79	76	74	274	441	470	490	370	366	358	469	22	45	48	50	35	35	34	48	22	38	41	43	34	33	32	39
Eritrea	12	13	13	13	14	14	15	15	114	111	118	110	122	127	133	134	12	11	12	11	12	13	13	13	2	2	2	2	3	3	3	3
Ethiopia	70	75	79	81	81	79	76	74	486	539	569	601	613	612	604	579	53	59	62	66	67	67	66	64	26	29	30	31	31	30	30	28
Gabon	94	104	112	114	121	134	152	170	434	249	302	299	288	332	358	379	38	20	28	26	23	32	34	35	48	23	36	37	34	40	40	41
Gambia	23	25	26	27	28	28	29	30	491	499	335	343	341	366	399	404	53	54	37	38	38	40	42	43	12	13	9	9	9	10	12	12
Ghana	36	36	35	34	33	33	32	32	368	358	359	358	359	357	355	353	38	38	38	38	38	38	37	37	17	16	16	16	15	15	15	14
Guinea	27	31	35	39	43	47	52	55	332	346	363	380	391	425	426	448	35	36	38	39	41	43	44	46	12	13	15	17	19	21	22	24
Guinea-Bissau	35	38	40	41	42	43	44	45	273	276	305	296	287	283	270	276	30	30	32	31	27	29	29	30	13	13	16	16	15	16	14	14
Kenya	240	235	235	236	230	205	182	169	393	384	392	402	410	388	340	319	29	29	30	31	32	32	28	26	84	76	73	69	65	59	45	39
Lesotho	416	434	462	479	486	483	482	481	356	370	399	408	414	421	408	568	16	17	20	19	16	18	18	37	60	63	72	70	77	97	67	226
Liberia	40	41	42	44	45	48	50	54	435	437	382	429	370	416	393	398	46	46	40	46	39	43	40	41	19	19	17	19	17	20	20	21
Madagascar	3	4	4	5	5	6	6	6	359	371	382	375	384	408	400	417	39	40	42	41	42	44	43	45	1	2	2	2	2	2	2	2
Malawi	297	289	289	284	279	268	252	235	362	350	358	353	346	342	324	305	23	23	24	23	23	23	22	21	102	96	99	96	93	93	87	81
Mali	49	51	53	54	54	55	55	55	571	573	572	578	584	589	593	599	61	61	60	61	61	62	62	63	24	25	26	27	27	27	28	28
Mauritania	20	24	27	29	31	32	33	34	619	624	632	642	494	565	556	559	67	68	68	69	54	61	60	60	11	13	15	16	12	15	15	15
Mauritius	< 1	< 1	< 1	< 1	< 1	1	1	1	39	42	40	39	38	39	39	39	3	4	4	3	3	3	3	3	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Mozambique	149	170	189	203	210	211	208	204	499	535	556	569	567	551	528	504	47	50	51	52	51	50	48	45	64	74	81	87	89	88	86	82
Namibia	417	461	501	528	538	535	524	516	481	506	544	560	572	570	556	532	27	26	30	26	32	32	32	29	60	57	69	71	77	86	91	73
Niger	12	13	14	15	15	16	16	16	278	280	288	275	287	285	289	292	30	30	31	30	31	31	31	31	5	6	6	6	7	7	7	7
Nigeria	70	77	83	88	89	88	86	83	489	526	563	575	573	563	543	521	50	54	57	59	58	58	55	53	36	39	43	44	44	43	42	40
Rwanda	170	177	182	182	177	167	157	149	442	503	549	581	607	607	595	590	39	46	50	54	57	58	57	57	78	84	87	87	85	80	73	70
Sao Tome & Principe	–	–	–	–	–	–	–	–	272	266	261	266	255	256	252	240	30	29	29	27	28	27	26	26	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Senegal	11	14	16	19	22	26	30	34	420	430	443	441	454	456	461	468	45	46	48	47	48	49	49	49	5	6	7	8	10	11	13	15
Seychelles	–	–	–	–	–	–	–	–	52	53	42	66	52	57	56	55	5	5	4	5	4	5	5	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Sierra Leone	56	64	72	81	90	98	106	114	675	696	743	784	830	866	902	941	71	74	78	82	86	90	94	98	26	29	33	37	42	45	47	50
South Africa	394	479	555	613	650	673	685	691	515	581	586	649	676	707	690	692	30	35	33	36	37	39	38	38	153	178	161	191	196	210	194	193
Swaziland	625	722	789	857	901	914	938	962	740	832	693	739	776	788	801	812	45	50	36	38	40	40	41	40	317	365	201	202	237	268	282	277
Togo	108	110	112	114	116	117	119	121	656	669	701	693	702	713	726	750	66	68	71	70	71	72	73	76	56	57	59	59	59	59	60	62
Uganda	171	173	173	168	162	155	147	139	364	367	383	380	373	364	353	337	30	30	32	32	32	31	30	29	59	58	60	59	57	55	52	49
UR Tanzania	168	171	178	176	165	153	139	128	391	411	447	476	472	469	450	426	34	37	41	44	44	44	43	41	69	67	69	70	66	63	57	52
Zambia	418	435	438	452	431	407	379	352	658	680	517	478	468	453	422	387	47	50	34	30	30	30	28	25	208	224	122	108	107	108	100	89
Zimbabwe	541	580	612	629	623	602	571	539	479	523	571	632	652	680	699	714	26	28	32	38	41	45	48	52	159	168	184	215	212	218	220	213
AFR	**123**	**133**	**142**	**148**	**149**	**145**	**141**	**136**	**436**	**461**	**480**	**497**	**501**	**500**	**487**	**475**	**41**	**43**	**45**	**47**	**47**	**47**	**46**	**45**	**49**	**52**	**51**	**53**	**53**	**53**	**49**	**48**

Rates are per 100 000 population (total country population, including HIV-positive and HIV-negative people). Estimates for all years are re-calculated as new information becomes available and techniques are refined, so they may differ from those published previously. Data (including for years 1990 to 1999) can be downloaded from www.who.int/tb

Table A3.5 **Case notifications and case detection rates, DOTS and non-DOTS combined, Africa, 2007**

	Notified TB cases, DOTS and non-DOTS combined															Estimated incidence and case detection rates				Proportions			
					New pulmonary					Re-treatment cases						Estimated incidence		Case detection rate					
	Population thousands	All notified number	New and relapse number	New and relapse rate	ss+ number	ss+ rate	ss- / unk. number	New extra-pulmonary number	Other new number	Relapse number	After failure number	After default number	Other re-treat. number	Other number	New pulm. lab. confirm. number	all forms number	ss+ number	all new %	new ss+ %	ss+ (% of pulm.)	ss+ (% of new+relapse)	Extrapulm. (% of new+relapse)	Re-treat. (% of new+re-treat.)
Algeria	33 858	21 540	21 369	63	8 439	25	1 807	10 576	0	547	57	103	11	0	8 608	19 156	8 577	109	98	82	39	49	3
Angola	17 024	42 383	41 292	243	21 422	126	14 733	2 911		2 226	446	645			21 422	48 777	21 041	80	102	59	52	7	8
Benin	9 033															8 206	3 563						
Botswana	1 882	8 096	7 622	405	3 002	160	3 092	1 305	0	223	40	129	305		3 002	13 761	5 251	54	57	49	39	17	9
Burkina Faso	14 784	4 243	3 960	27	2 614	18	577	513	77	179	193	39	51	0	2 614	33 437	14 227	11	18	82	66	13	11
Burundi	8 508	6 343	6 284	74	3 595	42	826	1 697	0	166	34	25	0	0	3 595	31 225	13 432	20	27	81	57	27	4
Cameroon	18 549	24 589	24 062	130	13 220	71	6 752	3 152	0	938	110	417	0	0	13 220	35 556	14 465	65	91	66	55	13	6
Cape Verde	530	292	274	52	158	30	63	39	0	14	3	15	0	0	190	798	359	33	44	71	58	14	11
Central African Republic	4 343															14 985	6 111						
Chad	10 781	6 200	5 879	55	2 513	23	2 378	907		81	217	104			2 513	32 203	13 608	18	18	51	43	15	6
Comoros	839															352	158						
Congo	3 768	9 121	9 002	239	3 552	94	2 938	2 282	0	230	31	88	0	0	3 552	15 190	6 376	58	56	55	39	25	4
Côte d'Ivoire	19 262	23 383	23 033	120	14 071	73	3 009	4 988	0	965	235	115	0	0	14 071	80 995	33 306	27	42	82	61	22	6
DR Congo	62 636	102 764	99 810	159	66 099	106	10 968	18 737		4 006	1 000	921	485	548	66 099	245 333	108 957	39	61	86	66	19	6
Equatorial Guinea	507															1 299	547						
Eritrea	4 851	3 743	3 641	75	694	14	2 086	753	0	108	11	15	76	0	3 743	4 629	2 009	76	35	25	19	21	6
Ethiopia	83 099	129 743	128 844	155	38 040	46	43 500	45 269	0	2 035	262	637	0	0	81 540	314 267	135 311	40	28	47	30	35	2
Gabon	1 331	3 943	3 766	283	1 462	110	1 678	409	52	165	9	168	0	0	1 462	5 408	2 208	67	66	47	39	11	9
Gambia	1 709	2 010	1 916	112	1 238	72	541	91	0	46	19	23	52	0	1 238	4 415	1 936	42	64	70	65	5	7
Ghana	23 478	12 961	12 743	54	7 429	32	3 759	1 092	0	463	127	91	0	0	8 110	47 632	20 694	26	36	66	58	9	5
Guinea	9 370	9 726	9 411	100	6 199	66	1 167	1 708	0	337	145	170	0	0	7 366	26 928	11 598	34	53	84	66	18	7
Guinea-Bissau	1 695															3 727	1 602						
Kenya	37 538	116 723	106 438	284	38 360	102	49 869	18 032	0	177	3 285	1 841	5 159	0	41 945	132 357	53 226	80	72	43	36	17	9
Lesotho	2 008	2 521	2 319	115	788	39	904	529	0	98	13	12	177	0	904	12 782	4 787	17	16	47	34	23	12
Liberia	3 750															10 393	4 474						
Madagascar	19 683	22 441	21 857	111	15 344	78	1 321	3 973	0	1 219	165	335	84	0	15 344	49 360	22 092	42	69	92	70	18	8
Malawi	13 925	26 299	24 461	176	7 608	55	10 704	5 195	0	954	60	25	1 753	0	7 608	48 144	18 386	49	41	42	31	21	11
Mali	12 337	5 395	5 166	42	3 894	32	391	674	0	207	145	71	0	13	3 894	39 345	17 021	13	23	91	75	13	8
Mauritania	3 124	3 025	2 969	95	1 714	55	494	603	0	158	14	42	0	0	1 714	9 923	4 359	28	39	78	58	20	7
Mauritius	1 262	108	106	8	86	7	12	4	0	4	0	2	0	0	86	282	125	36	69	88	81	4	6
Mozambique	21 397	38 044	37 651	176	18 214	85	13 064	5 020	0	1 353	205	188	0	0	18 214	92 295	37 165	39	49	58	48	13	5
Namibia	2 074	15 532	15 205	733	5 091	245	4 948	2 681	1 055	1 430	139	188	0	0	5 091	15 905	6 088	87	84	51	33	18	11
Niger	14 226	9 592	9 276	65	5 773	41	1 676	1 349	0	478	128	188	0	0	5 773	24 802	10 928	35	53	78	62	15	8
Nigeria	148 093	86 241	82 417	56	44 016	30	32 088	4 044	0	2 269	835	1 303	1 686	0	76 104	460 149	194 731	17	23	58	53	5	7
Rwanda	9 725	8 014	7 638	79	4 053	42	1 589	1 663		333	115	30		231	4 053	38 606	15 926	19	25	72	53	22	6
Sao Tome & Principe	158	93	93	59	58	37	28	2	0	5	0	0	0	0	58	159	72	55	81	67	62	2	5
Senegal	12 379	10 680	10 297	83	7 108	57	1 620	1 109	0	460	130	253	0	0	7 108	33 613	14 706	29	48	81	69	11	8
Seychelles	87															28	13						
Sierra Leone	5 866	9 623	9 418	161	5 347	91	3 197	706	0	168	40	165			5 347	33 662	14 478	27	37	63	57	7	4
South Africa	48 577	353 619	315 315	649	135 604	279	105 631	45 738	0	28 342	3 433	7 061	27 810	0	135 604	460 600	173 710	62	78	56	43	15	19
Swaziland	1 141	9 636	8 888	779	2 764	242	3 956	1 833	0	335	204	67	477	0	2 764	13 674	5 055	63	55	41	31	21	11
Togo	6 585	2 493	2 436	37	1 796	27	211	356	0	73	23	34	0	0	1 797	28 263	11 921	8	15	89	74	15	5
Uganda	30 884	41 612	40 909	132	21 303	69	13 713	4 460	0	1 433			703		21 303	101 785	41 865	39	51	61	52	11	5
UR Tanzania	40 454	62 092	59 371	147	24 520	61	20 521	12 526		1 804	92	207	2 422		45 041	120 291	48 508	48	51	54	41	21	7
Zambia	11 922	50 415	46 320	389	13 378	112	21 189	10 015	0	1 738	109	595	3 391	0	15 820	60 337	22 956	74	58	39	29	22	12
Zimbabwe	13 349	41 414	40 277	302	10 583	79	21 964	6 381	0	1 349	12	596	529	0	10 583	104 400	39 784	37	27	33	26	16	6
AFR	**792 378**	**1 326 692**	**1 251 735**	**158**	**561 149**	**71**	**408 964**	**223322**	**1184**	**57 116**	**12 086**	**16 908**	**45 171**	**792**	**668 500**	**2 879 434**	**1 187 713**	**41**	**47**	**58**	**45**	**18**	**10**

ss+ indicates sputum smear-positive; ss-, sputum smear-negative; unk., sputum smear result unknown; re-treat., re-treatment; pulm. lab. confirmed, pulmonary case confirmed by positive smear or culture. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.6 **DOTS coverage, case notifications and case detection rates, Africa, 2007**

	DOTS coverage	TB cases reported from DOTS services													Estimated incidence and case detection rate				Proportions			
		New and relapse		New pulmonary ss+		ss- / unk.	New extra-pulmonary	Other new	Re-treatment cases: Relapse	After failure	After default	Other re-treat.	Other	New pulm. lab. confirm.	Estimated incidence: all forms	ss+	DOTS case detection rate: all new	new ss+	ss+ (% of pulm.)	ss+ (% of new+relapse)	Extrapulm. (% of new+relapse)	Re-treat. (% of new+re-treat.)
	%	number	rate	number	rate	number	number	number	number	number	number	number	number	number	number	number	%	%				
Algeria	100	21 369	63	8 439	25	1 807	10 576	0	547	57	103	11	0	8 608	19 156	8 577	109	98	82	39	49	3
Angola	63	41 292	243	21 422	126	14 733	2 911		2 226	446	645			21 422	48 777	21 041	80	102	59	52	7	8
Benin															8 206	3 563						
Botswana	100	7 622	405	3 002	160	3 092	1 305	0	223	40	129	305		3 002	13 761	5 251	54	57	49	39	17	9
Burkina Faso	100	3 960	27	2 614	18	577	513	77	179	193	39	51	0	2 614	33 437	14 227	11	18	82	66	13	11
Burundi	100	6 284	74	3 595	42	826	1 697	0	166	34	25	0	0	3 595	31 225	13 432	20	27	81	57	27	4
Cameroon	100	24 062	130	13 220	71	6 752	3 152	0	938	110	417	0	0	13 220	35 556	14 465	65	91	66	55	13	6
Cape Verde	100	274	52	158	30	63	39	0	14	3	15	0	0	190	798	359	33	44	71	58	14	11
Central African Republic															14 985	6 111						
Chad	33	5 879	55	2 513	23	2 378	907		81	217	104			2 513	32 203	13 608	18	18	51	43	15	6
Comoros															352	158						
Congo	60	9 002	239	3 552	94	2 938	2 282	0	230	31	88	0	0	3 552	15 190	6 376	58	56	55	39	25	4
Côte d'Ivoire	100	23 033	120	14 071	73	3 009	4 988	0	965	235	115	0	0	14 071	80 995	33 306	27	42	82	61	22	6
DR Congo	100	99 810	159	66 099	106	10 968	18 737		4 006	1 000	921	485	548	66 099	245 333	108 957	39	61	86	66	19	6
Equatorial Guinea															1 299	547						
Eritrea	93	3 641	75	694	14	2 086	753	0	108	11	15	76	0	3 743	4 629	2 009	76	35	25	19	21	6
Ethiopia	95	128 844	155	38 040	46	43 500	45 269	0	2 035	262	637	0	0	81 540	314 267	135 311	40	28	47	30	35	2
Gabon	31	3 766	283	1 462	110	1 678	409	52	165	9	168	0	0	1 462	5 408	2 208	67	66	47	39	11	9
Gambia	100	1 916	112	1 238	72	541	91	0	46	19	23	52	0	1 238	4 415	1 936	42	64	70	65	5	7
Ghana	100	12 743	54	7 429	32	3 759	1 092	0	463	127	91	0	0	8 110	47 632	20 694	26	36	66	58	9	5
Guinea	60	9 411	100	6 199	66	1 167	1 708	0	337	145	170	0	0	7 366	26 928	11 598	34	53	84	66	18	7
Guinea-Bissau															3 727	1 602						
Kenya	100	106 438	284	38 360	102	49 869	18 032	0	177	3 285	1 841	5 159	0	41 945	132 357	53 226	80	72	43	36	17	9
Lesotho	100	2 319	115	788	39	904	529	0	98	13	12	177	0	904	12 782	4 787	17	16	47	34	23	12
Liberia															10 393	4 474						
Madagascar	100	21 857	111	15 344	78	1 321	3 973	0	1 219	165	335	84	0	15 344	49 360	22 092	42	69	92	70	18	8
Malawi	100	24 461	176	7 608	55	10 704	5 195	0	954	60	25	1 753	0	7 608	48 144	18 386	49	41	42	31	21	11
Mali	100	5 166	42	3 894	32	391	674	0	207	145	71	0	13	3 894	39 345	17 021	13	23	91	75	13	8
Mauritania	82	2 969	95	1 714	55	494	603	0	158	14	42	0	0	1 714	9 923	4 359	28	39	78	58	20	7
Mauritius	100	106	8	86	7	12	4	0	4	0	2	0	0	86	282	125	36	69	88	81	4	6
Mozambique	100	37 651	176	18 214	85	13 064	5 020	0	1 353	205	188	0	0	18 214	92 295	37 165	39	49	58	48	13	5
Namibia	100	15 205	733	5 091	245	4 948	2 681	1 055	1 430	139	188	0	0	5 091	15 905	6 088	87	84	51	33	18	11
Niger	100	9 276	65	5 773	41	1 676	1 349	0	478	128	188	0	0	5 773	24 802	10 928	35	53	78	62	15	8
Nigeria	91	82 417	56	44 016	30	32 088	4 044	0	2 269	835	1 303	1 686	0	76 104	460 149	194 731	17	23	58	53	5	7
Rwanda	100	7 638	79	4 053	42	1 589	1 663		333	115	30		231	4 053	38 606	15 926	19	25	72	53	22	6
Sao Tome & Principe	0														159	72						
Senegal	100	10 297	83	7 108	57	1 620	1 109	0	460	130	253	0	0	7 108	33 613	14 706	29	48	81	69	11	8
Seychelles															28	13						
Sierra Leone	100	9 418	161	5 347	91	3 197	706	0	168	40	165			5 347	33 662	14 478	27	37	63	57	7	4
South Africa	100	315 315	649	135 604	279	105 631	45 738	0	28 342	3 433	7 061	27 810	0	135 604	460 600	173 710	62	78	56	43	15	19
Swaziland	100	8 888	779	2 764	242	3 956	1 833	0	335	204	67	477	0	2 764	13 674	5 055	63	55	41	31	21	11
Togo	100	2 436	37	1 796	27	211	356	0	73	23	34	0	0	1 797	28 263	11 921	8	15	89	74	15	5
Uganda	100	40 909	132	21 303	69	13 713	4 460	0	1 433			703		21 303	101 785	41 865	39	51	61	52	11	5
UR Tanzania	100	59 371	147	24 520	61	20 521	12 526		1 804	92	207	2 422		45 041	120 291	48 508	48	51	54	41	21	7
Zambia	100	46 320	389	13 378	112	21 189	10 015	0	1 738	109	595	3 391	0	15 820	60 337	22 956	74	58	39	29	22	12
Zimbabwe	100	40 277	302	10 583	79	21 964	6 381	0	1 349	12	596	529	0	10 583	104 400	39 784	37	27	33	26	16	6
AFR	**93**	**1 251 642**	**158**	**561 091**	**71**	**408 936**	**223 320**	**1 184**	**57 111**	**12 086**	**16 908**	**45 171**	**792**	**668 442**	**2 879 434**	**1 187 713**	**41**	**47**	**58**	**45**	**18**	**10**

ss+ indicates sputum smear-positive; ss-, sputum smear-negative; unk., sputum smear result unknown; re-treat., re-treatment; pulm. lab. confirmed, pulmonary case confirmed by positive smear or culture. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.7 **Laboratory services, collaborative TB/HIV activities and management of MDR-TB, Africa, 2006–2007**

	Laboratory services, 2007				Collaborative TB/HIV activities								Management of MDR-TB, 2007				
					2006				2007								
	Number of labs working with NTP			Smear labs included	TB pts tested for	TB pts	HIV+ TB pts	HIV+ TB pts	TB pts tested for	TB pts	HIV+ TB pts	HIV+ TB pts	Lab-confirmed	DST	MDR	Re-treatment	Re-treatment
	smear	culture	DST	in EQA	HIV	HIV-positive	CPT	ART	HIV	HIV-positive	CPT	ART	MDR	in new cases	in new cases	DST	MDR
Algeria	246	48	3	20													
Angola	130	1	1	50					3 800	450	280	60					
Benin					3 318	494	337	213									
Botswana	50	1	1	50	5 046	3 590			5 106	3 493			139				
Burkina Faso	106	0	0	106	2 624	739	597	287	2 665	653	562	267	12	1	1	14	8
Burundi	168	1	0	143									26	0	0	0	0
Cameroon	208	3	2	206	8 639	3 363	384	117	13 258	5 707	1 365	1 044	0	0	0	0	0
Cape Verde	16	0	0	1	270	8	8		205			17	0	0	0	0	0
Central African Republic																	
Chad	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Comoros					116	2	0	0									
Congo	24	0	0	1	0	0	0	0	616	383	383	188	0	0	0	0	0
Côte d'Ivoire	96	1	1	95	5 810	2 130	1 185	994	11 264	4 370	3 935	1 153	0	0	0	0	0
DR Congo	1 205	1	1	1 023	3 931	188	170	120	14 484	2 129	2 015	419	15	37	15	123	67
Equatorial Guinea																	
Eritrea	64	0	0	0													
Ethiopia	833	1	1		3 255	1 295	1 108	354	20 723	6 342	4 529	2 658	145	13	1	296	144
Gabon	12	0	0	0	645	645	645		719				0	0	0	0	0
Gambia					550	142	0	23	0	0	0	12	0	0	0	58	0
Ghana	220	3	3	160	2 136	711	485	99	5 695	1 621	1 173	275	7	0	0		
Guinea	52	3	1	31					870	140	140	140	36	9	1	34	36
Guinea-Bissau					151	85	85	43									
Kenya	930	5	1	37	69 337	36 136	50 916	15 447	91 841	43 954	51 731	16 324	82	0	0	4 403	82
Lesotho					1 470	1 228	641	199	1 952	1 479	1 231	337					
Liberia					688	101											
Madagascar	243	1	1	131	0	0	0	0	0	0	0	0	5	103	1	29	4
Malawi	146	3	1	140	17 253	12 064	11 244	4 348	22 744	15 491	13 779	4 765	12	0	0	854	12
Mali	72	2	1	72	478	70			1 362	278			11		2	6	
Mauritania				54					63	63	63	54	14	0	0		
Mauritius	1	1	1	0	100	5	4	4	104	7	7	6	0	86	0	6	0
Mozambique	252	1	1	252	8 631	6 079	1 058	2 789	26 548	12 563	11 667	4 105	163	56	14	308	149
Namibia	34	1	1	34	4 653	3 117	3 117		8 185	4 804	4 804		291	0			
Niger	163	0	0	163	0	0	0	0	315	27	27		0	0	0	0	0
Nigeria	794	2	1	347	7 422	1 558	0		27 849	6 275	1 953		45	32	4	41	41
Rwanda	183	1	1	183	6 300	2 561	1 124	789	7 132	2 673	1 641	1 036	102	0			
Sao Tome & Principe	1	0	0	0	153	3	0	0	93	9	0	0	0	0	0	0	0
Senegal	86	3	3	55					2 381	316	235	114	10	170	7	30	3
Seychelles																	
Sierra Leone	80	0	0	80	2 080	174	105		3 621	414			0	0	0	0	0
South Africa	249	15	10	241	110 235	58 249	57 053	23 344	136 247	87 764	58 801	31 040	7 350				
Swaziland	16	1	1	3	1 847	1 476	1 298	287	5 804	4 316	4 875	1 099	110	0	0	320	110
Togo	51	1	1	52					134	17	17		1	16	1	21	1
Uganda	716	3	2	716	11 590	6 838	3 584	894	15 844	9 526	380	220					
UR Tanzania	717	3	1		1 613	841	418	188	31 305	14 669	10 541	4 619	169				25
Zambia	156	3	3	20	5 485	3 514	2 194	2 723	23 574	16 240	6 434	6 595	27	0	0	500	27
Zimbabwe	180	1	1	0	0	0	0	0	5 252	4 373	4 373	0	0	0	0	0	0
AFR	**8 547**	**110**	**45**	**4 466**	**285 826**	**147 406**	**137 760**	**53 262**	**491 755**	**250 546**	**186 941**	**76 547**	**8 772**	**523**	**47**	**7 043**	**709**

ART indicates antiretroviral therapy; CPT, co-trimoxazole preventive therapy; DST, drug susceptibility testing; EQA, external quality assurance; HIV+, HIV-positive; pts, patients. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.8 **Treatment outcomes, Africa, 2006 cohort**

	New smear-positive cases, DOTS											New smear-positive cases, non-DOTS											Smear-positive re-treatment cases, DOTS								
	Number of cases		% of notif	% of cohort							%	Number of cases		% of notif	% of cohort							%	Number	% of cohort							%
	Notified	Regist'd	regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	Success	Notified	Regist'd	regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	Success	Regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	Success
Algeria	8 538	8 285	97	86	5	2	0	3	4	0	91												607	65	14	4	2	9	6	0	79
Angola	15 915	21 499	135	11	7	1	0	4	1	76	18	5 584																			
Benin	2 943																														
Botswana	3 252	3 463	106	43	30	7	2	7	6	6	72												356	33	21	10	7	9	7	13	53
Burkina Faso	2 659	2 660	100	67	6	12	8	5	1	0	73												409	70	5	10	9	5	2	0	75
Burundi	3 119	3 233	104	66	16	4	1	11	1	0	83																				
Cameroon	12 870	13 811	107	64	10	6	1	13	4	2	74												10 148	10	34	6	1	12	8	29	44
Cape Verde	131	131	100	66	13	4	2	6	5	4	79												23	35	17	9	9	17	0	13	52
Central African Republic	4 365											83																			
Chad	0	2 768		35	19	6	2	30	8	0	54																				
Comoros	67																														
Congo	3 340	3 340	100	41	12	1	1	26	1	18	53												403	32	11	1	2	28	1	25	43
Côte d'Ivoire	12 867	12 868	100	61	12	8	2	10	6	2	73												1 192	50	18	8	7	10	3	5	68
DR Congo	63 488	63 488	100	82	5	5	1	5	2	0	86												6 345	63	4	8	3	14	3	6	67
Equatorial Guinea																															
Eritrea	680	735	108	80	9	6	1	1	2	0	90												69	72	7	7	6	4	3	0	80
Ethiopia	36 674	36 674	100	69	15	5	1	5	5	1	84												2 846	54	16	8	2	4	5	11	69
Gabon	1 145	1 145	100	34	13	5	1	44	1	3	46												115	28	23	3	3	42	0	3	50
Gambia	1 209	1 812	150	56	2	5	1	2	1	33	58																				
Ghana	7 786	7 786	100	71	6	9	2	6	6	0	76												537	46	16	11	3	8	3	13	63
Guinea	5 903	6 075	103	66	9	4	1	9	10	0	75												568	62	13	3	4	8	10	0	75
Guinea-Bissau	1 030																														
Kenya	39 154	39 154	100	73	12	5	0	7	3	0	85												3 945	71	8	7	1	8	5	0	79
Lesotho	4 024	725	18	56	11	12	2	6	3	11	66												201	23	30	22	1	1	2	20	54
Liberia	2 906																														
Madagascar	15 613	15 668	100	73	5	5	1	11	4	0	78												1 780	66	7	7	2	12	6	0	72
Malawi	8 166	8 166	100	77	1	12	1	3	2	3	78												1 006	78	2	12	1	2	2	2	80
Mali	3 802	3 803	100	70	6	11	4	6	2	1	76												449	63	5	10	7	10	3	2	68
Mauritania	1 486	1 652	111	31	9	2	0	12	9	35	41												280	25	7	1	2	11	6	48	33
Mauritius	85	157	185	46	46	3	0	5	0	0	92												7	57	43	0	0	0	0	0	100
Mozambique	18 275	18 275	100	82	1	10	1	5	2	0	83												1 818	63	2	12	2	7	14	0	65
Namibia	5 356	5 177	97	64	12	7	3	8	6	0	76												2 255	28	35	13	6	12	6	0	63
Niger	5 279	5 228	99	63	14	6	2	11	5	0	77												730	57	18	6	7	8	5	0	74
Nigeria	39 903	39 903	100	65	11	6	2	10	2	4	76												4 605	60	17	4	7	10	3	0	77
Rwanda	4 220	4 158	99	77	9	5	2	2	3	1	86												618	52	20	10	9	3	5	1	72
Sao Tome & Principe	0	0										36	36	100	94	0	3	3	0	0	0	94	0							0	
Senegal	6 882	6 882	100	69	7	4	2	10	8	0	76												896	59	6	6	5	13	7	4	65
Seychelles																															
Sierra Leone	4 629	4 660	101	75	12	5	1	6	1	0	87												297	72	11	8	2	7	1	0	82
South Africa	131 099	139 516	106	63	11	7	2	9	5	3	74												43 225	56	10	5	9	12	3	3	67
Swaziland	2 539	2 538	100	27	15	6	4	13	16	18	43												1 048	8	20	12	6	11	14	29	28
Togo	2 131	2 131	100	63	4	11	2	17	2	0	67																				
Uganda	20 364	20 364	100	29	41	6	1	13	5	7	70												1 357	33	43	8	1	10	4	0	76
UR Tanzania	24 724	24 724	100	80	5	8	0	3	4	0	85												4 639	38	39	12	1	4	4	2	78
Zambia	14 025	14 025	100	77	8	7	1	3	5	0	85												5 254	29	52	10	1	3	5	0	81
Zimbabwe	12 718	16 205	127	54	6	8	0	5	8	19	60												929	54	3	17	1	7	7	12	57
AFR	**555 361**	**562 884**	**101**	**65**	**10**	**6**	**1**	**8**	**4**	**5**	**75**	**5 703**	**36**	**1**	**94**	**0**	**3**	**3**	**0**	**0**	**0**	**94**	**98 957**	**49**	**17**	**7**	**5**	**11**	**5**	**6**	**66**

Not eval. indicates not evaluated (percentage of registered cases for which outcomes were not recorded); success, sum of cured and completed; cases regist'd, the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2006 is used as the denominator for calculating treatment outcomes unless it is less than the sum of outcomes, in which case the sum of outcomes is used. If the number of cases registered is not reported, then the number of cases notified in 2006 is used, or the sum of outcomes if the latter is greater. Data can be downloaded from www.who.int/tb

Table A3.9 **DOTS re-treatment outcomes, Africa, 2006 cohort**

	Relapse, DOTS									After failure, DOTS									After default, DOTS								
		% of cohort									% of cohort									% of cohort							
	Number regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	% Success	Number regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	% Success	Number regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	% Success
Algeria	480	69	14	4	2	6	5	0	83	28	46	14	7	11	4	18	0	61	99	55	11	2	3	23	6	0	66
Angola																											
Benin																											
Botswana																											
Burkina Faso	160	77	4	12	3	4	0	0	81	205	64	5	8	15	5	2	0	69	44	70	7	9	2	5	7	0	77
Burundi																											
Cameroon	1 272	50	12	10	3	20	6	0	62																		
Cape Verde																											
Central African Republic																											
Chad																											
Comoros																											
Congo	281	37	10	0	2	33	1	17	47	34	9	6	9	3	21	0	53	15	88	23	18	1	1	16	0	41	41
Côte d'Ivoire																											
DR Congo	3 872	74	3	8	3	10	2	0	77	992	53	3	9	8	23	4	0	56	997	57	5	7	2	26	3	0	62
Equatorial Guinea																											
Eritrea																											
Ethiopia																											
Gabon																			115	28	23	3	3	42	0	3	50
Gambia																											
Ghana	497	46	17	10	3	7	3	13	63	18	44	0	28	11	6	0	11	44	22	50	9	18	5	18	0	0	59
Guinea	268	69	13	4	3	3	8	0	82	134	56	12	2	10	9	10	0	68	166	55	13	3	2	16	11	0	68
Guinea-Bissau																											
Kenya	3 945	71	8	7	1	8	5	0	79																		
Lesotho	81	44	16	20	0	1	1	17	60	16	19	6	25	13	6	6	25	25	14	57	14	7	0	0	7	14	71
Liberia																											
Madagascar	1 691	69	4	7	3	12	6	0	73	0									0								
Malawi	1 006	78	2	12	1	2	2	2	80																		
Mali	220	71	4	9	4	9	2	2	75	146	58	7	11	9	8	4	3	65	83	51	7	10	11	18	2	1	58
Mauritania	280	25	7	1	2	11	6	48	33																		
Mauritius	6	50	50	0	0	0	0	0	100										1	100	0	0	0	0	0	0	100
Mozambique	1 435	65	2	11	1	6	14	0	67	178	60	5	14	2	17	2	0	65	205	49	2	15	5	5	24	0	51
Namibia	1 353	46	15	13	9	11	6	0	61																		
Niger	475	61	16	6	4	7	6	0	77	107	42	16	9	21	10	1	0	58	148	54	24	5	5	8	3	0	78
Nigeria																											
Rwanda	359	70	6	8	7	3	4	2	76	96	45	9	9	31	1	4	0	54	41	63	15	2	5	10	2	2	78
Sao Tome & Principe	0									0									0								
Senegal	475	61	5	5	4	9	6	8	66	113	50	4	12	7	19	9	0	53	308	59	8	6	5	16	7	0	67
Seychelles																											
Sierra Leone	130	75	10	5	2	7	0	0	85	51	73	10	8	4	6	0	0	82	116	67	12	11	0	7	3	0	79
South Africa	19 930	54	4	5	15	17	4	0	58	1 329	47	24	7	6	8	5	4	71	6 266	57	21	3	4	2	6	6	78
Swaziland	346	19	12	12	8	8	14	27	31	130	8	7	9	14	16	15	31	15	36	8	17	6	6	22	8	33	25
Togo																											
Uganda	1 357	33	43	8	1	10	4	0	76																		
UR Tanzania	1 817	75	4	12	1	4	4	0	79	124	60	6	11	5	8	10	0	66	257	59	10	13	0	12	6	1	68
Zambia	1 865	71	11	9	1	3	5	0	81	97	52	20	20	5	3	1	0	71	403	37	39	14	2	4	4	0	76
Zimbabwe	929	54	3	17	1	7	7	12	57																		
AFR	**44 530**	**60**	**7**	**7**	**8**	**12**	**5**	**1**	**66**	**3 798**	**50**	**12**	**9**	**8**	**13**	**5**	**3**	**62**	**9 409**	**56**	**18**	**5**	**4**	**7**	**6**	**5**	**74**

Not eval. indicates not evaluated (percentage of registered cases for which outcomes were not recorded); success, sum of cured and completed; cases regist'd, the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2006 is used as the denominator for calculating treatment outcomes unless it is less than the sum of outcomes, in which case the sum of outcomes is used. If the number of cases registered is not reported, then the number of cases notified in 2006 is used, or the sum of outcomes if the latter is greater. Data can be downloaded from www.who.int/tb

Table A3.10 **DOTS treatment success and case detection rates, Africa, 1994–2007**

	DOTS new smear-positive treatment success (%)													DOTS new smear-positive case detection rate (%)												
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Algeria			86			87	87	84	89	90	91	87	91			133			127	117	117	116	109	109	104	98
Angola				15	68		68	66	74	68	68	72	18			61	39	51		75	104	104	90	84	79	102
Benin	76	73	72	73	77	77		79	80	81	83	87		84	82	82	81	86	86		84	81	82	83	86	
Botswana	72	67	70	70	47	71	77	78	71	77	65	70	72	70	87	89	90	72	73	66	67	58	58	59	61	57
Burkina Faso		25	29	61	59	61	60	65	64	66	67	71	73	12	21	16	17	16	16	14	13	13	14	16	19	18
Burundi	44	45		67	74		80	80	79	79	78	79	83	20	25	30	19	36		30	25	26	26	25	24	27
Cameroon				80	75	75	77	62	70		71	74	74		5		11	21	33	39	56	77	78	89	89	91
Cape Verde											71	64	79							42				39	37	44
Central African Republic		37					57	61		59	91	65			62					8	47	5	4	35	71	
Chad	63	47			64				72	78	69		54	36	14			35			29	7	14	19		18
Comoros	94	90		85		93	93	92	96		94	91		54	57		54		49	53	42	28	38	48	42	
Congo	69					61	69	66	71	69	63	28	53	72			55		90	83	88	57	65	57	52	56
Côte d'Ivoire	17	68	56	61	62	63		73	67	72	71	75	73	53	53	49	48	44	34	9	34	34	34	34	38	42
DR Congo	71	80	48	64	70	69	78	77	78	83	85	85	86	40	47	43	53	50	47	49	47	53	59	60	59	61
Equatorial Guinea	89	89	77	82						51				86	76	75	86						75			
Eritrea				83	73	44	76	80	82	85	85	88	90			9	11	41	43	49	42	55	42	38	36	35
Ethiopia	74	61	73	72	74	76	80	76	76	70	79	78	84	15	20	22	24	25	31	30	30	31	31	28	27	28
Gabon								49	47	34	40	46	46							85	72	85	86	61	58	66
Gambia	74	76	80	70				71	74	75	86	87	58	74	67	70	73				68	65	60	64	65	64
Ghana		54	51	48	59	55	50	56	60	66	72	73	76	16	14	32	33	31	38	41	41	40	37	37	38	36
Guinea	78	78	75	74	73	74	68	74	72	75	72	72	75	45	53	51	54	53	55	53	52	51	53	54	55	53
Guinea-Bissau						35		51	48	80	75	69							46		43	55	73	78	68	
Kenya	73	75	77	65	77	78	80	80	79	80	80	82	85	58	60	56	60	60	53	61	63	65	68	70	72	72
Lesotho	56	47	71	63		69		71	52	70	69	73	66	63	74	87	78		78		71	79	90	90	84	16
Liberia		79		75		74	80	76	76	73	70	76			30		44		32	27	56	36	66	55	69	
Madagascar	51	55		64			70	69	74	71	71	74	78	52	65		67			67	65	71	71	65	74	69
Malawi	22	71	68	71	69	71	73	70	72	73	71	73	78	42	44	47	51	45	44	44	40	39	43	43	43	41
Mali	68	59	65	62	70	68		50	50	65	71	75	76	17	19	21	20	19	17		20	21	20	22	23	23
Mauritania										58	22	55	41										44	29	36	39
Mauritius	96				91	87	93	93	92	87	89	86	92	86			83	93	88	66	67	77	92	87	68	69
Mozambique	67	39	54	67		71	75	78	78	76	77	79	83	59	55	53	53	50	47	45	45	45	46	47	49	49
Namibia			66	58	61	51	56	63	66	63	68	75	76	22	85	88	90	85	82	84	81	90	82	83	87	84
Niger			57	66		60	65	64	58	70	61	74	77			31	33	37	41	44	42	51	46	52	51	53
Nigeria	65	49	32	73	73	75	79	79	79	78	73	75	76	11	11	11	11	12	12	12	11	15	17	18	20	23
Rwanda			61	68	72	67	61		58	67	77	83	86	34	35	41	54	44	32	25	28	30	27	26	27	25
Sao Tome & Principe																										
Senegal	38	44	44	55	48	58	52	53	66	70	74	76	76	62	65	57	55	48	53	54	49	53	50	50	49	48
Seychelles		89	100	100		90	82	67	45	100	92				82	97	67		83	90	68	38	100	62		
Sierra Leone	75	69	74	79		75	77	80	81	83	82	86	87	29	41	40	36		33	33	32	31	34	36	35	37
South Africa			69	73	74	60	66	65	68	67	70	71	74			7	23	66	63	60	71	77	75	72	77	78
Swaziland								36	47	42	50	42	43								35	36	41	46	52	55
Togo	45	60	65	66	69	76		55	68	63	67	71	67	13	13		12	11	12		4	13	16	17	19	15
Uganda			33	40	62	61	63	56	60	68	70	73	70			60	60	60	51	47	47	47	48	47	48	51
UR Tanzania	80	73	76	77	76	78	78	81	80	81	81	82	85	61	60	57	58	56	52	51	48	49	51	50	50	51
Zambia								75	83	75	83	84	85								45	69	65	58	58	58
Zimbabwe					70	73	69	71	67	66	54	68	60				55	49	45	44	42	36	36	32	32	27
AFR	**59**	**62**	**57**	**63**	**70**	**69**	**72**	**71**	**73**	**73**	**74**	**76**	**75**	**23**	**26**	**30**	**35**	**37**	**36**	**37**	**43**	**45**	**46**	**46**	**47**	**47**

Treatment success, sum of cured and completed; DOTS new smear-positive case detection rate, notified new smear-positive cases divided by estimated incident cases. Figures for all years are updated as new information becomes available and/or techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.11 **New smear-positive case notification by age and sex, DOTS and non-DOTS, Africa, 2007**

	Male							Female							All							Male/female
	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+	ratio
Algeria	95	1 388	1 749	813	494	296	407	109	1 031	811	335	273	247	391	204	2 419	2 560	1 148	767	543	798	1.6
Angola	484	2 824	3 197	2 255	1 357	699	465	703	2 943	2 721	1 812	1 041	554	367	1 187	5 767	5 918	4 067	2 398	1 253	832	1.1
Benin																						
Botswana	25	251	535	442	263	120	82	46	347	430	254	123	47	37	71	598	965	696	386	167	119	1.3
Burkina Faso	8	233	442	429	303	176	145	29	157	243	187	129	88	45	37	390	685	616	432	264	190	2.0
Burundi	26	425	637	542	372	177	88	55	360	392	276	140	67	38	81	785	1 029	818	512	244	126	1.7
Cameroon	121	1 392	2 613	1 874	1 011	480	307	152	1 443	1 963	985	483	248	148	273	2 835	4 576	2 859	1 494	728	455	1.4
Cape Verde	0	24	30	26	18	4	6	0	18	17	5	1	3	6	0	42	47	31	19	7	12	2.2
Central African Republic																						
Chad																						
Comoros																						
Congo	28	351	635	482	233	78	63	45	411	608	334	153	71	60	73	762	1 243	816	386	149	123	1.1
Côte d'Ivoire	173	1 576	2 705	1 817	981	532	429	225	1 349	1 973	1 126	596	354	235	398	2 925	4 678	2 943	1 577	886	664	1.4
DR Congo	1 343	6 485	9 548	7 925	5 341	2 801	1 752	1 842	7 130	8 415	5 939	4 127	2 352	1 099	3 185	13 615	17 963	13 864	9 468	5 153	2 851	1.1
Equatorial Guinea																						
Eritrea	21	56	85	73	62	53	44	2	70	89	56	47	21	15	23	126	174	129	109	74	59	1.3
Ethiopia	1 055	6 522	6 114	3 545	2 038	1 051	559	1 229	5 426	5 507	2 850	1 429	502	213	2 284	11 948	11 621	6 395	3 467	1 553	772	1.2
Gabon																						
Gambia																						
Ghana	66	596	1 164	1 239	861	477	506	75	453	667	564	371	183	207	141	1 049	1 831	1 803	1 232	660	713	1.9
Guinea	46	901	1 315	936	503	240	204	76	631	613	367	207	106	79	122	1 532	1 928	1 303	710	346	283	2.0
Guinea-Bissau																						
Kenya	474	4 752	8 132	4 959	2 361	1 084	601	599	4 594	5 979	2 774	1 180	542	329	1 073	9 346	14 111	7 733	3 541	1 626	930	1.4
Lesotho	6	32	135	73	87	52	28	4	78	121	106	40	13	13	10	110	256	179	127	65	41	1.1
Liberia																						
Madagascar	196	1 473	2 353	2 097	1 671	823	438	223	1 456	1 810	1 354	880	378	192	419	2 929	4 163	3 451	2 551	1 201	630	1.4
Malawi	61	614	1 454	954	473	233	158	109	768	1 497	715	342	146	84	170	1 382	2 951	1 669	815	379	242	1.1
Mali	29	369	696	570	422	291	213	30	263	385	258	160	113	95	59	632	1 081	828	582	404	308	2.0
Mauritania	14	206	355	261	144	139	83	21	103	152	92	64	38	42	35	309	507	353	208	177	125	2.3
Mauritius	0	9	9	12	15	9	6	0	4	7	3	5	4	3	0	13	16	15	20	13	9	2.3
Mozambique																						
Namibia	57	370	1 018	786	346	149	120	69	417	826	513	242	102	76	126	787	1 844	1 299	588	251	196	1.3
Niger	40	571	1 380	958	577	405	249	57	287	412	323	248	157	109	97	858	1 792	1 281	825	562	358	2.6
Nigeria	503	4 251	8 541	5 776	3 767	1 853	1 341	685	4 522	5 944	3 088	1 926	1 194	625	1 188	8 773	14 485	8 864	5 693	3 047	1 966	1.4
Rwanda	51	523	805	556	352	168	91	81	477	468	245	131	70	35	132	1 000	1 273	801	483	238	126	1.7
Sao Tome & Principe	0	4	12	8	4	4	0	0	9	6	3	3	5	0	0	13	18	11	7	9	0	1.2
Senegal	57	1 053	1 722	875	549	329	251	73	761	603	378	241	121	95	130	1 814	2 325	1 253	790	450	346	2.1
Seychelles																						
Sierra Leone	45	538	1 032	797	520	258	172	74	398	568	468	255	143	79	119	936	1 600	1 265	775	401	251	1.7
South Africa	1 909	10 514	21 948	20 076	12 164	4 792	2 021	2 511	14 410	21 049	13 190	6 245	2 964	1 811	4 420	24 924	42 997	33 266	18 409	7 756	3 832	1.2
Swaziland		223	479	344	182	57	27		411	576	232	98	39	18		634	1 055	576	280	96	45	1.0
Togo	7	156	309	276	170	73	66	17	184	256	150	67	35	30	24	340	565	426	237	108	96	1.4
Uganda	234	1 741	4 406	3 551	1 681	766	505	343	1 874	3 008	1 742	824	382	246	577	3 615	7 414	5 293	2 505	1 148	751	1.5
UR Tanzania	189	2 021	4 665	3 855	2 231	1 317	1 066	238	1 735	3 388	1 945	947	535	388	427	3 756	8 053	5 800	3 178	1 852	1 454	1.7
Zambia	152	1 235	2 971	1 848	805	319	204	195	1 335	2 193	1 188	558	244	131	347	2 570	5 164	3 036	1 363	563	335	1.3
Zimbabwe	138	500	3 693	0	716	292	153	185	739	3 311	0	553	213	90	323	1 239	7 004	0	1 269	505	243	1.1
AFR	**7 653**	**54 179**	**96 884**	**71 030**	**43 074**	**20 597**	**12 850**	**10 102**	**56 594**	**77 008**	**43 857**	**24 129**	**12 281**	**7 431**	**17 755**	**110 773**	**173 892**	**114 887**	**67 203**	**32 878**	**20 281**	**1.3**

For some countries, breakdown of notified cases by age and sex is missing, or is provided for a subset of cases. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.12 **New smear-positive case notification rates by age and sex, DOTS and non-DOTS, Africa, 2007**

	Male							Female							All						
	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+
Algeria	2	37	56	36	33	37	58	2	28	27	15	19	29	46	2	33	41	26	26	33	51
Angola	12	165	283	310	292	265	260	18	170	237	239	203	180	158	15	167	260	273	245	220	203
Benin																					
Botswana	8	114	321	461	402	342	331	14	160	276	275	167	108	91	11	137	299	370	277	212	182
Burkina Faso	0	15	40	66	91	102	79	1	11	23	29	33	38	17	1	13	32	47	59	66	42
Burundi	1	46	114	161	151	144	107	3	39	68	76	49	40	28	2	42	90	117	97	85	58
Cameroon	3	71	191	216	179	132	104	4	74	147	116	82	61	41	4	72	169	166	130	95	69
Cape Verde	0	40	78	94	128	74	81	0	30	42	17	5	32	42	0	35	60	55	55	48	55
Republic																					
Chad																					
Comoros																					
Congo	4	93	223	264	210	112	122	6	108	216	185	127	86	86	5	100	220	225	167	98	102
Côte d'Ivoire	4	75	194	204	146	119	136	6	64	147	142	99	89	76	5	70	171	175	124	105	106
DR Congo	9	106	230	307	332	282	255	12	116	201	225	236	200	118	11	111	215	266	282	238	176
Equatorial Guinea																					
Eritrea	2	11	20	39	63	73	101	0	14	21	28	36	21	21	1	12	20	33	48	43	52
Ethiopia	6	78	108	93	83	67	50	7	65	96	73	55	30	16	6	71	102	83	68	48	32
Gabon																					
Gambia																					
Ghana	1	24	64	101	107	89	122	2	19	38	47	46	33	45	2	21	51	74	76	61	82
Guinea	2	96	202	208	162	125	160	4	70	98	84	66	50	48	3	83	151	147	114	86	96
Guinea-Bissau																					
Kenya	6	116	286	296	228	193	135	8	113	213	165	104	84	61	7	115	250	231	163	134	94
Lesotho	1	14	102	130	188	147	73	1	32	79	128	52	24	23	1	23	90	129	103	72	43
Liberia																					
Madagascar	5	76	173	223	262	225	153	5	75	132	142	135	96	57	5	76	153	182	198	158	101
Malawi	2	44	154	180	139	101	85	3	55	161	127	88	55	36	3	50	157	153	112	76	58
Mali	1	30	87	130	167	215	114	1	21	46	51	48	55	38	1	25	66	87	99	118	70
Mauritania	2	65	145	157	129	271	166	3	34	65	57	56	57	67	3	50	106	107	92	150	111
Mauritius	0	9	8	12	17	19	17	0	4	7	3	6	7	6	0	7	8	8	12	13	11
Mozambique																					
Namibia	15	155	645	751	552	395	391	18	175	542	483	320	210	178	16	165	594	616	425	291	267
Niger	1	48	166	150	111	142	101	2	22	46	53	62	62	52	1	34	104	103	90	105	79
Nigeria	2	28	84	88	84	68	68	2	30	59	46	41	40	26	2	29	72	67	62	53	45
Rwanda	2	44	133	156	133	138	97	4	40	67	59	42	43	25	3	42	98	104	84	84	54
Principe	0	23	98	129	95	186	0	0	53	49	45	58	180	0	0	38	74	86	75	183	0
Senegal	2	82	199	159	155	132	97	3	60	68	65	62	46	35	3	71	133	110	106	88	65
Seychelles																					
Sierra Leone	4	97	268	282	268	201	202	6	71	145	159	120	97	73	5	84	206	219	191	145	129
South Africa	25	217	538	677	582	373	243	33	300	537	435	266	188	134	29	258	537	555	415	271	176
Swaziland		157	600	834	610	279	166		287	683	434	242	147	83		222	643	609	399	205	118
Togo	0	23	66	91	85	60	74	1	27	54	49	32	26	26	1	25	60	70	57	42	47
Uganda	3	55	218	306	242	178	153	5	60	152	159	110	76	58	4	57	185	234	174	123	100
UR Tanzania	2	49	162	220	201	187	201	3	42	119	111	79	64	57	2	46	141	166	137	120	120
Zambia	6	97	343	394	294	172	138	7	106	265	270	179	104	64	6	101	305	334	233	134	95
Zimbabwe	5	30	333	0	207	144	76	7	44	319	0	137	79	33	6	37	326	0	169	107	51
AFR	**4**	**66**	**171**	**195**	**179**	**142**	**117**	**6**	**70**	**137**	**119**	**94**	**74**	**53**	**5**	**68**	**154**	**157**	**135**	**106**	**81**

Rates are per 100 000 population of each age/sex group. Rates are calculated excluding those countries for which breakdown of notified cases or population by age and sex is missing. Data can be downloaded from www.who.int/tb

Table A3.13 **TB case notifications, Africa, 1980–2007**

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Algeria	2 702		13 916	13 681	13 133	13 832	12 917	11 212	11 325	11 039	11 607	11 332	11 428	13 345	13 345	13 507	15 329	16 522	15 324	16 647	18 572	18 250	18 934	19 730	19 809	21 336	21 143	21 369
Angola	10 117	7 501	7 911	6 625	10 153	8 653	9 363	8 510	8 184	9 587	10 271	11 134	11 272	8 269	7 157	5 143	15 424	15 066	14 296	14 235	16 062	21 713	29 996	36 079	35 437	37 175	50 419	41 292
Benin	1 835	1 862	1 793	1 804	1 913	2 041	2 162	1 901	2 027	1 941	2 084	2 162	2 420	2 340	2 119	2 332	2 284	2 255	2 316	2 552	2 706		2 830	2 932	3 116	3 270	3 619	
Botswana	2 662	2 605	2 705	2 883	3 101	2 706	2 627	3 173	2 740	2 532	2 938	3 274	4 179	4 654	4 756	5 665	6 636	7 287	7 960	8 647	9 292	9 618	10 204	9 862	10 131	10 058	8 413	7 622
Burkina Faso	2 577	2 391	2 265	3 061	877	4 547	1 018	1 407	949	1 616	1 497	1 488		1 443	861	2 572	1 814	1 643	2 074	2 310	2 310	2 406	2 376	2 620	2 878	3 484	3 941	3 960
Burundi	789	643	951	1 053	1 904	2 317	2 569	2 739	3 745	4 608	4 575	4 883	4 464	4 677	3 840	3 326	3 796	5 335	6 546	6 365		6 478	6 371	6 871	7 164	6 585	6 114	6 284
Cameroon	2 434	2 236	3 765	3 445	3 338	3 393	2 138	3 878	4 982	5 521	5 892	6 814	6 803	7 064	7 312	3 292	3 049	3 952	5 022	7 660	5 251	11 307	11 057	15 964	17 655	21 499	23 483	24 062
Cape Verde	516	344	393	230	285	259		285	276	210	221					303	179	196	205			291	195	316	294	292	262	274
Central African Republic	651	758	1 475	1 686	468	520	779	499	814	64	2 124	2 045				3 339	3 623	4 459	4 875	5 003		2 550	4 837	3 932	3 908	3 210	6 045	
Chad	220	286	127	1 977	1 430	1 486	1 285	1 086	2 977	2 572	2 591	2 912	2 684	2 871	3 303	3 186	1 936	2 180	2 784	4 710			5 077	4 679	4 946	6 311		5 879
Comoros									212	139	140	119	108	129	115	123	138	134	132	153	120	138	111	73	89	111	112	
Congo	742	1 214	3 716	4 156	2 776	2 648	3 120	3 473	3 878	4 363	591	618	1 179	1 976	2 992	3 615	4 469	3 417	3 863	5 023	9 239	9 735	9 888	7 782	9 729	9 853	8 478	9 002
Côte d'Ivoire	4 197	4 418	5 000	6 000	6 062	5 729	6 072	6 422	6 556	6 982	7 841	8 021	9 093	9 563	14 000	11 988	13 104	13 802	14 841	15 056	12 943	16 533	16 071	17 739	20 084	19 681	20 746	23 033
DR Congo	5 122	3 051	9 905	13 021	20 415	26 082	27 665	27 096	30 272	31 321	21 131	33 782	37 660	36 647	38 477	42 819	45 999	44 783	58 917	59 531	60 627	66 748	70 625	84 687	93 336	97 075	95 666	99 810
Equatorial Guinea					181	17	1	11	20	157	260	331	262	309	356	306	319	366	416						536			
Eritrea											3 699		4 386	11 664	15 505	21 453	5 220	8 321	7 789	6 037	6 652	2 743	2 805	4 708	4 239	3 549	3 026	3 641
Ethiopia	40 096	42 423	52 403	56 824	65 045	71 731	80 846	85 867	95 521	80 795	88 634	60 006	60 006		99 329	26 034	41 889	59 105	69 472	72 095	91 101	94 957	110 289	117 600	123 127	124 262	122 198	128 844
Gabon	865	796	761	752	654	855	769	864	721	912	917	906	926	972	1 034	1 115	951	1 434	1 380	1 598		2 504	2 086	2 208	2 588	2 512	3 051	3 766
Gambia	239	58														1 023	1 242	1 357	1 558	1 514			1 859	1 945	2 142	2 031	1 795	1 916
Ghana	5 207	4 041	4 345	2 651	1 935	3 235	3 925	5 877	5 297	6 017	6 407	7 136	7 044	8 569	17 004	8 636	10 449	10 749	11 352	10 386	10 933	11 923	11 723	11 891	11 827	12 124	12 471	12 743
Guinea		1 884	1 469	832	1 203	1 317	1 128	1 214	1 740	1 869	1 988	2 267	2 941	3 167	3 300	3 523	4 357	4 439	4 768	5 171	5 440	5 874	6 199	6 570	7 423	6 863	8 787	9 411
Guinea-Bissau	645	465	205	376	368	530	1 310	752	778	1 362	1 163	1 246	1 059	1 558	1 647	1 613	1 678	1 445	846	1 164	1 273		1 566	1 647	1 835	1 774	2 137	
Kenya	11 049	10 027		11 966		10 460	10 022	10 515	10 957	12 592	11 788	12 320	14 599	20 451	22 930	28 142	34 980	39 738	48 936	57 266	64 159	73 017	80 183	91 522	100 573	102 680	108 342	106 438
Lesotho	4 082	3 830	4 932	3 443	2 923	2 927	21	225	2 346	2 463	2 525	2 994	3 327	3 384	4 334	5 181	5 598	6 447	7 806	8 552	9 746		10 111	12 007	11 404	10 802	12 073	2 319
Liberia	774	1 002	835	885		425	232	384	894				1 948	1 766	1 764	1 393	840		1 753		1 500	1 751	3 419	2 511	4 337	3 432	4 447	
Madagascar	9 082	7 464	3 573	3 588	8 673	3 220	3 717	4 007	4 393	5 417	6 261	6 015	8 126	9 855	10 671	21 616	12 718		14 661			16 447	16 718	19 309	20 001	18 993	21 966	21 857
Malawi	4 758	5 033	4 411	4 707	4 404	5 335	6 260	7 581	8 359	9 431	12 395	14 743	14 237	17 105	19 496	19 155	20 630	20 676	22 674	24 396	23 604	26 094	24 595	25 841	27 030	25 491	25 054	24 461
Mali	839	933	187	532	1 872	1 621	1 851	2 534	2 578	1 626	2 933	2 631	3 113	3 204	3 075	3 087	3 655	5 022	4 142	4 466	4 216		4 457	4 496	4 525	4 697	4 989	5 166
Mauritania	7 576	9 427	2 327	2 333	3 977	4 406	2 257	3 722	3 928	4 040	5 284	3 064	4 316	3 996		3 849	3 837	3 788	3 617	3 649	3 067				3 326	2 162	2 694	2 969
Mauritius	132	157	121	152	118	111	119	117	114	129	119	134	130	159	149	131	116	121	120	154	160	123	139	137	137	125	114	106
Mozambique	7 457	6 984	5 787	5 937	5 204	5 645	8 263	10 996	13 863	15 958	15 899	16 609	15 085	16 588	17 158	17 882	18 443	18 842	19 672	20 574	21 158	22 098	25 544	28 602	31 150	33 231	35 257	37 651
Namibia						4 840	4 427	3 640	2 815	3 703	2 671	2 500	1 756	5 500		1 540	9 625	9 947	11 147	10 035	10 799	13 064	13 282	14 490	15 026	14 920	14 673	15 205
Niger	717	2 871	754	673	665	698	570	556	631	608	5 200			626	3 784	1 980		4 021	5 046	3 900	4 701	5 115	5 185	7 078	6 822	7 873	8 474	9 276
Nigeria	9 877	10 838	10 949	10 212	11 439	14 937	14 071	19 723	25 700	13 342	20 122	19 626	14 802	11 601	8 449	13 423	15 020	16 660	20 249	24 157	25 821	45 842	38 628	44 184	57 246	62 598	70 734	82 417
Rwanda	1 495	1 386		1 364	1 419	1 327	2 460	3 287	4 145	4 741	6 387	3 200				3 054	3 535	4 710	6 112	6 483	6 093	5 473	6 011	6 812	6 487	7 220	8 117	7 638
Sao Tome & Principe	131	37	40	59	49	40	8	55	13		17	120		97	41				106	96	97	97	94	457	121	136	153	93
Senegal	2 014	2 573	1 612	2 417		1 065	927	6 145	5 611	5 965	4 977	6 781	7 408	6 841	6 913	7 561	8 525	8 322	8 475	7 488	8 508	8 554	8 366	9 380	9 098	9 765	10 133	10 297
Seychelles	16	0	16	16	10	10	24	14	10	6	41			5		8	15	18	11	21	20	19	29	10	18	14		
Sierra Leone	750	847	889	293	816	865	358	130	120		632	1 466	1 665	2 691	2 564	1 955	3 241	3 160	3 270		3 760	4 673	4 793	5 289	5 710	6 737	8 041	9 418
South Africa	55 310	59 943	64 115	62 556	62 717	59 349	55 013	57 406	61 486	68 075	80 400	77 652	82 539	89 786	90 292	73 917	109 328	125 913	142 281	148 164	151 239	148 257	215 120	227 320	267 290	270 178	303 114	315 315
Swaziland		143	3 059	1 955				1 098	1 352	1 394		1 531		1 458		2 050	2 364	3 022	3 653	4 167	5 877	6 118	6 748	7 749	8 071	8 062	8 278	8 888
Togo	208	126	204	174	343	745	596	1 184	1 071	940	1 324	1 243	1 223	1 005	1 137	1 520	1 654	1 623	1 250	1 249	1 409		1 645	1 815	2 212	2 537	2 819	2 436
Uganda	1 058	1 170	497	2 029			1 392	1 464	3 066	1 045	14 740	19 016	20 662	21 579	26 994	25 316	27 196	28 349	29 228	31 597	30 372	36 829	40 695	41 795	43 721	41 040	40 782	40 909
UR Tanzania	11 483	12 122	11 748	11 753	12 092	13 698	15 452	16 920	18 206	19 262	22 249	25 210	28 462	31 460	34 799	39 847	44 416	46 433	51 231	52 437	54 442	61 603	60 306	61 579	62 512	61 022	59 282	59 371
Zambia	5 321	6 162	6 525	6 860	7 272	8 246	8 716	10 025	12 876	14 266	16 863	23 373	25 448	30 496	35 222	35 958	40 417			45 240	49 806	46 259	54 220	53 932	54 106	49 576	47 790	46 320
Zimbabwe	4 057	4 051	4 577	3 881	5 694	4 759	5 233	5 848	6 002	6 822	9 132	11 710	16 237	20 125	23 959	30 831	35 735	43 762	47 077	50 138	50 855	56 222	59 170	53 183	56 162	50 454	44 328	40 277
AFR	**219 802**	**224 102**	**240 263**	**258 842**	**264 928**	**296 627**	**301 683**	**333 842**	**373 550**	**365 432**	**418 530**	**412 414**	**432 997**	**418 995**	**550 183**	**504 309**	**585 773**	**598 821**	**689 253**	**750 086**	**783 930**	**861 423**	**1 004 557**	**1 079 333**	**1 179 378**	**1 186 800**	**1 243 560**	**1 251 735**
Number reporting	40	41	39	41	37	41	41	43	44	41	43	40	37	41	38	45	44	42	45	41	38	37	44	44	46	45	43	39
% reporting	87	89	85	89	80	89	89	93	96	89	93	87	80	89	83	98	96	91	98	89	83	80	96	96	100	98	93	85

From 1995 on, number shown is all notified new and relapse cases (DOTS and non-DOTS). Figures for all years are updated as new information becomes available, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.14 **TB case notification rates, Africa, 1980–2007**

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Algeria	14		69	66	61	63	57	48	47	45	46	44	43	49	48	48	53	57	52	55	61	59	60	62	61	65	63	63
Angola	129	93	94	76	113	93	98	87	82	94	98	103	100	71	60	42	122	116	108	105	115	152	204	238	227	231	305	243
Benin	49	49	45	44	45	46	48	41	42	39	40	40	43	40	35	38	36	34	34	36	37		37	37	38	39	41	
Botswana	267	253	254	262	273	231	217	254	213	191	215	233	289	313	311	362	414	445	476	508	537	549	575	549	558	548	453	405
Burkina Faso	38	34	32	42	12	59	13	17	11	19	17	16		15	9	25	17	15	19	20	19	20	19	20	21	25	27	27
Burundi	19	15	22	23	40	47	51	52	70	83	80	84	75	77	62	53	60	84	102	97		95	90	94	95	84	75	74
Cameroon	27	24	39	35	33	32	20	35	43	46	48	54	52	53	53	23	21	27	33	49	33	70	66	94	101	121	129	130
Cape Verde	178	117	131	75	91	81		86	81	60	62					76	44	47	48			63	41	65	59	58	51	52
Central African Republic	28	32	60	66	18	19	28	18	28	2	71	66				97	102	123	131	132		65	121	97	95	77	142	
Chad	5	6	3	40	28	28	24	20	52	43	42	46	41	43	48	45	26	29	35	58			56	49	50	62		55
Comoros									43	27	27	22	19	22	19	20	22	21	20	23	17	19	15	10	11	14	14	
Congo	41	65	194	210	136	126	145	156	170	185	24	25	46	75	110	129	156	116	127	161	288	296	294	226	276	273	230	239
Côte d'Ivoire	50	50	55	62	60	55	55	56	55	57	61	61	67	68	96	80	85	87	91	90	76	95	91	99	110	106	110	120
DR Congo	18	11	33	43	65	80	83	79	85	85	56	86	92	86	87	94	99	94	121	120	120	128	132	153	164	165	158	159
Equatorial Guinea					63	6	0	3	6	47	77	95	74	85	95	80	82	91	101						113			
Eritrea											117		138	367	487	668	160	249	227	170	181	72	70	113	97	78	64	75
Ethiopia	108	111	133	140	155	165	180	185	199	163	173	113	110		170	43	67	92	106	107	131	133	151	157	160	157	151	155
Gabon	127	114	106	101	86	109	95	103	83	102	100	96	95	97	101	106	88	129	122	138		208	170	177	204	195	233	283
Gambia	36	8														88	103	109	121	113			126	128	136	126	108	112
Ghana	46	34	36	21	15	24	28	41	36	40	41	45	43	51	98	48	57	57	59	53	54	58	56	55	54	54	54	54
Guinea		40	31	17	24	25	21	22	31	32	33	36	45	46	47	48	58	57	60	64	66	70	73	76	84	76	96	100
Guinea-Bissau	81	57	25	44	42	59	143	80	81	138	114	119	98	139	143	135	137	115	65	87	93		108	110	118	111	130	
Kenya	68	59		66		53	49	50	50	56	50	51	58	79	86	103	124	137	165	188	205	228	244	271	290	288	296	284
Lesotho	315	288	361	245	203	199	1	15	151	156	158	184	202	203	256	301	319	361	428	461	517		523	616	580	545	605	115
Liberia	41	52	42	43		20	11	18	41				94	86	85	65	37		65		49	55	105	76	130	100	124	
Madagascar	100	80	37	36	85	31	35	36	39	46	52	49	64	75	79	155	88		96			99	98	109	110	102	115	111
Malawi	77	79	67	70	63	73	82	93	97	104	131	152	145	173	196	190	200	195	207	216	203	218	201	206	210	193	185	176
Mali	14	15	3	8	28	24	27	36	35	22	38	33	39	39	36	35	41	55	44	46	42		42	41	40	40	42	42
Mauritania	504	611	147	143	238	257	128	206	212	213	272	153	211	190		173	168	161	149	146	120				115	73	89	95
Mauritius	14	16	12	15	12	11	12	11	11	12	11	13	12	15	13	12	10	11	10	13	13	10	12	11	11	10	9	8
Mozambique	61	56	45	46	39	42	62	82	104	119	117	120	105	112	111	112	112	112	114	116	116	118	133	146	155	162	168	176
Namibia						428	375	294	217	272	188	170	116	351		93	565	568	620	545	575	683	684	736	754	739	717	733
Niger	12	48	12	11	10	10	8	8	9	8	66			7	42	21		40	49	36	42	44	43	57	53	59	62	65
Nigeria	14	15	15	13	14	18	17	23	29	15	21	20	15	11	8	12	13	14	17	20	21	36	29	33	41	44	49	56
Rwanda	29	26		24	24	22	38	48	58	65	88	45				54	60	74	87	85	75	64	69	76	72	78	86	79
Sao Tome & Principe	138	38	41	59	48	39	8	51	12		15	101		79	33				78	70	69	68	65	310	81	89	99	59
Senegal	34	43	26	38		16	13	85	75	78	63	83	89	80	78	84	92	87	86	74	82	81	77	84	79	83	84	83
Seychelles	24	0	24	24	15	15	35	20	14	8	57			7		11	20	23	14	26	25	23	35	12	21	16		
Sierra Leone	23	26	26	9	23	24	10	3	3		15	36	40	65	62	47	78	75	76		83	99	97	102	106	121	140	161
South Africa	190	201	209	199	195	180	163	167	176	190	220	207	214	227	223	178	258	291	323	331	333	322	462	483	562	564	628	649
Swaziland		23	470	292				142	167	166		172		158		214	242	303	358	401	555	569	619	703	724	717	730	779
Togo	7	4	7	6	11	22	17	33	29	24	33	31	29	24	26	34	35	33	25	24	26		29	31	36	41	44	37
Uganda	8	9	4	15			9	9	19	6	83	103	108	109	131	119	124	126	126	132	123	145	155	154	156	142	136	132
UR Tanzania	61	63	59	57	57	63	69	73	76	78	87	96	105	112	120	133	145	147	159	159	161	177	169	168	167	159	150	147
Zambia	89	100	103	105	107	118	121	135	168	181	208	280	297	347	390	388	426			442	477	434	499	487	480	432	409	389
Zimbabwe	56	54	58	47	67	54	57	61	61	67	87	109	147	178	207	261	298	359	381	400	402	440	460	411	431	385	335	302
AFR	**58**	**57**	**60**	**62**	**62**	**67**	**66**	**71**	**78**	**74**	**82**	**78**	**80**	**75**	**96**	**86**	**97**	**97**	**108**	**115**	**117**	**126**	**143**	**150**	**160**	**157**	**161**	**158**

Rates are per 100 000 population. From 1995 on, number shown is notification rate of new and relapse cases. Figures for all years are updated as new information becomes available and/or techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.15 **New smear-positive cases notified, Africa, 1990–2007**

	Number of cases																		Rate (per 100 000 population)																	
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Algeria					6 793	5 735	6 556	7 740	7 462	7 845	8 328	7 953	8 246	8 549	8 285	8 654	8 538	8 439					25	20	23	26	25	26	27	26	26	27	26	26	26	25
Angola				4 874	4 337	3 804	8 016	8 246	7 333	7 379	9 053	11 923	18 087	18 971	20 301	20 410	21 499	21 422				42	36	31	63	64	55	54	65	83	123	125	130	127	130	126
Benin				1 653	1 618	1 839	1 868	1 939	1 988	2 192	2 286		2 415	2 438	2 582	2 739	2 943					29	27	30	29	29	29	31	32		31	31	31	32	34	
Botswana				1 508	1 668	1 903	2 530	2 824	3 112	2 746	3 091	3 057	3 334	3 050	3 127	3 170	3 252	3 002				101	109	122	158	172	186	161	179	174	188	170	172	173	175	160
Burkina Faso					561	1 028	1 381	1 126	1 331	1 411	1 560	1 522	1 544	1 703	1 926	2 294	2 659	2 614					6	10	13	10	12	12	13	12	12	13	14	16	19	18
Burundi				1 861	1 527	1 121	1 533	2 022	2 782	2 924		3 040	2 791	3 087	3 277	3 262	3 119	3 595				31	25	18	24	32	43	45		44	40	42	43	42	38	42
Cameroon				2 316	1 883	2 896	2 312	3 548	4 374	5 832	3 960	4 695	7 921	10 692	11 218	13 001	12 870	13 220				17	14	21	16	24	29	38	25	29	48	63	64	73	71	71
Cape Verde						111	117	103	104			140	111	165	169	135	131	158						28	28	25	24			30	23	34	34	27	25	30
Central African Republic						1 794	1 992	2 267	2 637	2 725		1 382	2 758	2 818	2 923	2 153	4 448							52	56	63	71	72		35	69	69	71	51	104	
Chad						2 002	870			2 920			3 519	3 599	2 270	2 516		2 513						28	12			36			39	38	23	25		23
Comoros						103	107	100	99	112	87	92	72	48	63	79	67							17	17	16	15	16	12	13	10	6	8	10	8	
Congo					1 691	2 013	2 505	1 984	2 044	2 222	4 218	4 319	5 019	3 477	4 121	3 640	3 340	3 552					62	72	87	67	67	71	132	131	149	101	117	101	91	94
Côte d'Ivoire				7 012		8 254	8 927	9 093	9 850	10 047	8 497	10 920	11 026	11 430	12 250	12 496	12 867	14 071				50		55	58	57	61	60	50	63	62	64	67	67	68	73
DR Congo				14 924		20 914	24 125	24 609	33 442	34 923	36 123	42 054	44 518	53 578	62 192	65 040	63 488	66 099				35		46	52	52	69	71	71	81	83	97	109	111	105	106
Equatorial Guinea						219	209	226	284						406									57	53	56	69						86			
Eritrea								120	135	527	590	702	646	887	720	687	680	694								4	4	15	16	18	16	21	17	15	14	14
Ethiopia					5 752	9 040	13 160	15 957	18 864	21 597	30 510	33 028	36 541	39 698	41 430	38 525	36 674	38 040					10	15	21	25	29	32	44	46	50	53	54	49	45	46
Gabon					395	486	263	577	889	916		1 137	1 033	1 233	1 323	1 042	1 145	1 462					38	46	24	52	78	79		94	84	99	104	81	87	110
Gambia						778	743	820	900	861			1 035	1 040	1 011	1 127	1 209	1 238						67	62	66	70	64			70	68	64	70	73	72
Ghana					5 778	2 638	6 474	7 254	7 757	6 877	7 316	7 712	7 732	7 714	7 259	7 505	7 786	7 429					33	15	35	39	40	35	36	37	37	36	33	33	34	32
Guinea				2 082	2 158	2 263	2 844	2 981	3 362	3 563	3 920	4 092	4 300	4 495	5 015	5 479	5 903	6 199				31	30	31	38	39	43	44	48	49	51	52	57	61	64	66
Guinea-Bissau						956	922	855	541	704	526		899	963	1 186	1 132	1 030							80	75	68	42	53	38		62	64	77	71	63	
Kenya	6 800	7 000	7 700	10 149	11 324	13 934	16 978	19 040	24 029	27 197	28 773	31 307	34 337	38 158	41 167	40 389	39 154	38 360	29	29	31	39	43	51	60	66	81	89	92	98	104	113	119	113	107	102
Lesotho				1 405	1 330	1 361	1 788	2 398	2 476	2 729	3 041		3 167	3 652	4 272	4 280	4 024	788				84	78	79	102	134	136	147	161		164	187	217	216	202	39
Liberia				1 547		1 154	668		1 190		1 021	934	1 974	1 319	2 490	2 167	2 906					75		54	29		44		33	29	61	40	74	63	81	
Madagascar				6 881	7 366	8 026	8 456		9 639			11 092	11 387	12 881	13 526	13 056	15 613	15 344				52	54	58	59		63			67	66	73	75	70	81	78
Malawi	4 301	4 059	4 630	5 692	5 988	6 285	6 703	7 587	8 765	8 132	8 260	8 309	7 703	7 716	8 566	8 443	8 166	7 608	46	42	47	58	60	62	65	72	80	72	71	70	63	61	66	64	60	55
Mali					1 740	1 866	2 173	3 178	2 558	2 690	2 527		2 757	3 015	3 069	3 523	3 802	3 894					20	21	24	35	27	28	25		26	28	27	30	32	32
Mauritania						2 074		2 519	1 172	2 051	1 583				1 662	1 155	1 486	1 714						93		107	48	82	62				58	39	49	55
Mauritius						113	99	112	109	122	115	85	86	99	117	110	85	86						10	9	10	9	10	10	7	7	8	10	9	7	7
Mozambique				9 526	9 677	10 566	10 478	11 116	12 116	12 825	13 257	13 967	15 236	16 138	17 058	17 877	18 275	18 214				64	63	66	64	66	70	72	73	75	80	82	85	87	87	85
Namibia						697	2 849	3 220	3 598	3 760	4 012	4 535	4 689	5 487	5 155	5 222	5 356	5 091						42	167	184	200	204	213	237	241	279	259	259	262	245
Niger				463	1 865	1 492		3 452	3 195	2 631	3 045	3 476	3 495	4 505	4 311	5 050	5 279	5 773				5	21	16		35	31	25	27	30	29	36	34	38	38	41
Nigeria				1 723		9 476	10 662	11 235	13 161	15 903	17 423	23 410	21 936	28 173	33 755	35 048	39 903	44 016				2		9	10	10	11	13	14	18	17	21	24	25	28	30
Rwanda						1 840	2 034	2 820	4 417	4 298	3 681	3 252	3 956	4 627	4 179	4 166	4 220	4 053						33	35	44	63	56	45	38	45	52	46	45	45	42
Sao Tome & Principe										30	30	41	42	33	50	49	36	58										22	21	29	29	22	33	32	23	37
Senegal					4 599	5 421	5 949	5 430	5 454	5 011	5 823	6 094	5 796	6 587	6 437	6 722	6 882	7 108					52	60	64	57	56	50	56	57	53	59	56	57	57	57
Seychelles				2		6	11	13	9	10	11	12	9	5	13	8						3		8	14	17	11	12	14	15	11	6	15	9		
Sierra Leone					1 408	1 454	2 234	2 296	2 262		2 472	2 692	2 938	3 113	3 735	4 370	4 629	5 347					34	35	54	54	53		55	57	60	60	69	78	81	91
South Africa						23 112	42 163	54 073	66 047	72 098	75 967	83 808	98 799	116 364	126 268	125 460	131 099	135 604						56	99	125	150	161	167	182	212	247	266	262	272	279
Swaziland						660	2 226			1 781	1 823	1 279	1 410	1 585	1 902	2 187	2 539	2 764						69	228			171	172	119	129	144	171	194	224	242
Togo				545		887	913	935	904	904	984		1 203	1 306	1 608	1 798	2 131	1 796				13		20	20	19	18	17	18		21	22	26	29	33	27
Uganda				11 949	14 763	13 631	15 312	17 254	18 222	18 463	17 246	17 291	19 088	20 310	20 986	20 559	20 364	21 303				60	72	64	70	76	78	77	70	68	73	75	75	71	68	69
UR Tanzania	11 553	12 008	13 510	15 569	17 164	19 955	21 472	22 010	23 726	24 125	24 049	24 685	24 136	24 899	25 823	25 264	24 724	24 520	45	46	50	55	59	67	70	70	74	73	71	71	68	68	69	66	63	61
Zambia					9 620	10 038	12 072			11 645	12 927	13 024	16 351	18 934	17 247	14 857	14 025	13 378					107	108	127		114	124	122	150	171	153	129	120	112
Zimbabwe				5 331		8 965	11 965	14 512	14 492	14 414	14 392	15 370	15 941	14 488	14 581	13 155	12 718	10 583				47		76	100	119	117	115	114	120	124	112	112	100	96	79
AFR	**22 654**	**23 067**	**25 840**	**107 012**	**121 005**	**212 910**	**264 659**	**277 591**	**326 831**	**349 142**	**362 527**	**402 431**	**459 983**	**513 029**	**551 031**	**550 001**	**561 064**	**561 149**	**4**	**4**	**5**	**19**	**21**	**36**	**44**	**45**	**51**	**54**	**54**	**59**	**65**	**71**	**75**	**73**	**73**	**71**

Rates are per 100 000 population. Figures for all years are updated as new information becomes available and/or techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.16 **NTP budgets, available funding, cost of utilization of general health-care services and total TB control costs (US$ millions), Africa, 2009**

	NTP budget	Available funding: Government (excluding loans)	Available funding: Loans	Available funding: Grants (excluding Global Fund)	Available funding: Global Fund	Funding gap	Cost of utilization of general health-care services	Total TB control costs	Completeness of budget data
Algeria									N
Angola									N
Benin									N
Botswana	4.7	1.8	0	1.1	1.0	0.8	12	17	C
Burkina Faso	3.0	0.2	0	0.1	2.8	0	0.7	3.7	C
Burundi	2.2	0.1	0	0.3	1.8	0	0.7	2.9	C
Cameroon	1.9	0.3	0	0	0.5	1.0	5.9	7.8	C
Cape Verde	0.3	0.1	0	0.05	0	0.2	0.2	0.4	C
Central African Republic									N
Chad									N
Comoros									N
Congo									N
Côte d'Ivoire							0.9	0.9	N
DR Congo	53	0.3	0	3.3	11	39	12	66	C
Equatorial Guinea									N
Eritrea	38	11	0	0	7.0	21	0.1	38	C
Ethiopia	26	1.1	0	1.0	6.2	18	8.5	35	C
Gabon	1.4	0.2	0	0.1	0	1.1	1.2	2.7	C
Gambia									N
Ghana	19	1.1	0	0	5.9	12	0.6	20	C
Guinea									N
Guinea-Bissau									N
Kenya	37	6.6	1.0	12	2.5	15	5.1	42	C
Lesotho									N
Liberia									N
Madagascar	8.1	0.3	0	< 0.01	2.9	4.9	1.7	9.8	C
Malawi	8.7	3.8	0	1.0	4.0	< 0.01	0.9	9.6	C
Mali	3.0	0.9	0	0	1.3	0.8	0.6	3.6	C
Mauritania	1.9	0.6	0	0	1.3	0	0.04	1.9	C
Mauritius							0.4	0.4	N
Mozambique	25	6.4	0	7.9	4.4	6.0	5.9	31	C
Namibia	4.3	1.9	0	1.2	1.2	< 0.01	2.0	6.2	C
Niger	0	0	0	0.05	0.8	< 0.01		0	P
Nigeria	44	7.3	0	4.4	13	19	11	55	C
Rwanda	1.3	0.2	0	0.4	0.7	< 0.01	0.1	1.4	C
Sao Tome & Principe	0.9	0.2	0	0.02	0.7	< 0.01	0.02	1.0	C
Senegal	3.1	0.7	0	0.2	2.2	0	0.3	3.3	C
Seychelles									N
Sierra Leone									N
South Africa							251	251	P
Swaziland	9.2	4.6	0	1.1	3.5	< 0.01	0.1	9.3	C
Togo	1.7	0.4	0	0.3	1.1	0	0.3	2.0	C
Uganda	17	1.3	0	0.1	4.8	11	1.2	18	C
UR Tanzania	25	7.1	0	4.7	5.4	7.4	4.2	29	C
Zambia	13	0.8	0	2.1	7.1	2.4	1.3	14	C
Zimbabwe	17	0.6	0	4.1	3.4	9.6	4.1	22	C
AFR	**371**	**60**	**1**	**46**	**97**	**158**	**333**	**704**	**59%**

N indicates data not available or not applicable; P indicates partial financial data; C indicates complete data and therefore included in analysis presented in chapter 3. Completeness of budget data in total row indicates percentage of countries providing complete financial data. Data can be downloaded from www.who.int/tb

Notes

Botswana

TABLE A3.8: cases not evaluated include 15 cases diagnosed with MDR-TB.

Malawi

TABLE A3.8: patients for whom treatment outcomes are not reported include those who died before starting treatment, and those whose diagnosis was changed.

Mozambique

TABLE A3.6: while DOTS is available in all administrative areas, only 1092 out of 1333 (82%) health facilities were providing DOTS services in 2007.

TABLE A3.11: breakdown of notified cases by sex was not available. In 2007, of the 18 324 notified new smear-positive cases, 333 were in patients aged under 15 years, and 17 881 were patients aged 15 years or more.

Zimbabwe

TABLE A3.11: all new smear-positive cases in people aged 25–44 years are shown under 25–44 years.

THE AMERICAS

The Americas

NTP MANAGER (OR EQUIVALENT) AND/OR PERSON(S) RESPONSIBLE FOR COMPLETING DATA COLLECTION FORM	
Anguilla	Lynette Rogers; Lynrod Brooks
Antigua & Barbuda	Oritta Zachariah; Janet Samuel
Argentina	Sergio Arias
Bahamas	Alice Neymour
Barbados	R.A. Manohar Singh
Belize	Marvin Manzanero
Bermuda	
Bolivia	Miram Nogales Rodriguez
Brazil	Draurio Barreira; Stefano Barbosa Codenotti; Gisele Pinto de Oliveira
British Virgin Islands	Athelene Linton
Canada	Edward Ellis; Victor Galant
Cayman Islands	A. K. Kumar; Timothy E. D. McLaughlin-Munroe
Chile	Manuel Zuñiga Gajardo; Zulema Torres Gaete
Colombia	Gilberto Alvarez Uribe; Ernesto Moreno Naranjo; César Castiblanco Montañez
Costa Rica	Zeidy Mata A.
Cuba	María Josefa Llanes Cordero
Dominica	David Johnson; Paul Ricketts
Dominican Republic	Belkys Marcelino; Lourdes McDougall Alarcon
Ecuador	Jorge Iñiguez Luzuriaga; Christian Acosta
El Salvador	Julio Garay Ramos; Marta De Abrego; Xochil Aleman
Grenada	Alister Antoine
Guatemala	Carlos Paz
Guyana	Jeetendra Mohanlall
Haiti	Richard D'Meza; Fleurimonde Charles
Honduras	Cecilia Elena Varela Martinez
Jamaica	Michael Williams
Mexico	Martín Castellanos Joya; Martha A. García Avilés; Héctor A. Téllez Medina
Montserrat	Dorothea L Hazel
Netherlands Antilles	
Nicaragua	Orlando Aristides Sequeira Perez
Panama	Cecilia Lyons de Arango; C. Torres, J. Bravo
Paraguay	Juan Carlos Jara Rodríguez; Celia Martínez de Cuellar; Ofelia Cuevas; Tomasa Portillo; Mirian Alvarez
Peru	César Antonio Bonilla Asalde; Rula Aylas Salcedo; Ana María Chavez; Remy Quispe; Ronal Jamanca
Puerto Rico	Ada S. Martinez; María del Carmen Bermúdez
Saint Kitts & Nevis	Dianne Francis-Delaney; William Turner
Saint Lucia	Alina Montane Jaime
St Vincent & Grenadines	Roger Duncan; Jennifer George
Suriname	
Trinidad & Tobago	Dottin Ramoutar; Leilawat Mohammed
Turks & Caicos Islands	
Uruguay	Jorge Rodriguez de Marco
USA	Kenneth G. Castro; Ryan Wallace
US Virgin Islands	
Venezuela	Mercedes España Cedeño; Andrea Maldonado Saavedra

This list shows the people named on the data collection form sent to WHO in 2008, not necessarily the current NTP manager. It is intended as an acknowledgement rather than a directory.

Table A3.1 **Methods and assumptions for estimation of TB incidence, prevalence and mortality, the Americas**

	Reference year	Incidence est. based on	Trend	Source of estimates			Cfr ss+ HIV-		Duration ss+HIV-		Duration ss-HIV-	
				TB/HIV	MDR (new)	MDR (re-treat)	DOTS	non-DOTS	DOTS	non-DOTS	DOTS	non-DOTS
Anguilla	1997	Notif.	Group, exp.	–	Model	Model	0.1	0.2	1	1.5	1	1.5
Antigua & Barbuda	1997	Notif.	Group, moving ave.	Routine	Model	Model	0.1	0.2	1	1.5	1	1.5
Argentina	1997	Notif.	Country notifs, exp.	Indirect	DRS	DRS	0.1	0.1	1	1.5	1	1.5
Bahamas	2000	Notif.	Not estimated	Routine	Model	Model	0.1	0.2	1	1.5	1	1.5
Barbados	1997	Notif.	Group, moving ave.	Indirect	Model	Model	0.1	0.2	1	1.5	1	1.5
Belize	1997	Notif.	Not estimated	Indirect	Model	Model	0.1	0.2	1	1.5	1	1.5
Bermuda	1997	Notif.	Group, moving ave.	–	Model	Model	0.1	0.2	1	1.5	1	1.5
Bolivia	1997	Notif.	Group, exp.	Indirect	DRS	DRS	0.1	0.2	1	1.5	1	1.5
Brazil	2005	Mort.	Mortality, exp.	Routine	DRS	DRS	0.1	0.1	1	1.5	1	1.5
British Virgin Islands	1997	Notif.	Group, moving ave.	–	Model	Model	0.1	0.2	1	1.5	1	1.5
Canada	1997	Notif.	Group, moving ave.	Indirect	DRS	DRS	0.12	0.12	0.75	0.75	0.75	0.75
Cayman Islands	1997	Notif.	Group, moving ave.	Routine	Model	Model	0.1	0.2	1	1.5	1	1.5
Chile	1997	Notif.	Country notifs, exp.	Indirect	DRS	DRS	0.1	0.1	1	1.5	1	1.5
Colombia	1997	Notif.	Country notifs, exp.	Routine	DRS	Model	0.1	0.15	1	1.5	1	1.5
Costa Rica	1997	Notif.	Group, exp.	Indirect	DRS	DRS	0.1	0.15	1	1.5	1	1.5
Cuba	1997	Notif.	Country notifs, exp.	Indirect	DRS	DRS	0.1	0.1	1	1.5	1	1.5
Dominica	1997	Notif.	Group, exp.	–	Model	Model	0.1	0.2	1	1.5	1	1.5
Dominican Republic	1997	Notif.	Group, exp.	Indirect	DRS	DRS	0.1	0.2	1	1.5	1	1.5
Ecuador	1997	Notif.	Group, exp.	Sentinel	DRS	DRS	0.1	0.2	1	1.5	1	1.5
El Salvador	1997	Notif.	Country notifs, exp.	Routine	DRS	DRS	0.1	0.15	1	1.5	1	1.5
Grenada	1997	Notif.	Group, exp.	–	Model	Model	0.1	0.2	1	1.5	1	1.5
Guatemala	1997	Notif.	Country notifs, exp.	Indirect	DRS	DRS	0.1	0.15	1	1.5	1	1.5
Guyana	1997	Notif.	Country notifs, moving ave.	Indirect	Model	Model	0.1	0.2	1	1.5	1	1.5
Haiti	1997	Notif.	Not estimated	Routine	Model	Model	0.1	0.2	1	1.5	1	1.5
Honduras	1997	Notif.	Group, exp.	Routine	DRS	DRS	0.1	0.15	1	1.5	1	1.5
Jamaica	1997	Notif.	Not estimated	Routine	Model	Model	0.1	0.2	1	1.5	1	1.5
Mexico	2003	Mort.	Country notifs, exp.	Indirect	DRS	DRS	0.1	0.15	1	1.5	1	1.5
Montserrat	1997	Notif.	Group, exp.	–	Model	Model	0.1	0.2	1	1.5	1	1.5
Netherlands Antilles	1997	Notif.	Group, moving ave.	–	Model	Model	0.1	0.225	1	2	1	2
Nicaragua	1997	Notif.	Country notifs, exp.	Indirect	DRS	DRS	0.1	0.15	1	1.5	1	1.5
Panama	1997	Notif.	Not estimated	Routine	Model	Model	0.1	0.15	1	1.5	1	1.5
Paraguay	1997	Notif.	Country notifs, exp.	Indirect	DRS	DRS	0.1	0.2	1	1.5	1	1.5
Peru	1997	Notif.	Country notifs, exp.	Indirect	DRS	DRS	0.1	0.15	1	1.5	1	1.5
Puerto Rico	1997	Notif.	Country notifs, moving ave.	Routine	–	–	0.1	0.2	1	1.5	1	1.5
Saint Kitts & Nevis	1997	Notif.	Group, exp.	–	Model	Model	0.1	0.2	1	1.5	1	1.5
Saint Lucia	1997	Notif.	Group, exp.	Routine	Model	Model	0.1	0.2	1	1.5	1	1.5
St Vincent & Grenadines	1997	Notif.	Group, exp.	Routine	Model	Model	0.1	0.2	1	1.5	1	1.5
Suriname	1997	Notif.	Country notifs, moving ave.	Indirect	Model	Model	0.1	0.2	1	1.5	1	1.5
Trinidad & Tobago	1997	Notif.	Not estimated	Indirect	Model	Model	0.1	0.2	1	1.5	1	1.5
Turks & Caicos Islands	1997	Notif.	Group, moving ave.	–	Model	Model	0.1	0.2	1	1.5	1	1.5
Uruguay	1997	Notif.	Country notifs, exp.	Routine	DRS	DRS	0.1	0.1	1	1.5	1	1.5
US Virgin Islands	1997	Notif.	Group, moving ave.	–	Model	Model	0.1	0.2	1	1.5	1	1.5
USA	1997	Notif.	Country notifs, moving ave.	Routine	–	–	0.12	0.12	0.75	0.75	0.75	0.75
Venezuela	1997	Notif.	Country notifs, exp.	Routine	DRS	DRS	0.1	0.1	1	1.5	1	1.5

– indicates no estimate; ARI, annual risk of infection; ave, average; C-ReC., capture re-capture; CDR, case detection rate; DRS, drug resistance survey; exp., exponential; HIV+, HIV-positive; HIV-, HIV-negative; Mort., mortality (vital registration); Notif(s)., notification(s); Prev., disease prevalence survey; ss+, sputum smear-positive; ss-, sputum smear-negative. See Annex 2 (methods) for details. Data can be downloaded from www.who.int/tb

Table A3.2 **Estimated burden of TB, the Americas, 1990 and 2007**

	Incidence, 1990				Prevalence, 1990		TB mortality, 1990		Incidence, 2007								Prevalence, 2007				TB mortality, 2007				HIV prevalence in incident TB cases (%)	MDR, 2007			
	All forms*		Smear-positive*		All forms*		All forms*		All forms*		All forms HIV+		Smear-positive*		Smear-positive HIV+		All forms*		All forms HIV+		All forms*		All forms HIV+			Percentage of		Number among	
	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate		new	re-treat	all cases	smear-positive
Anguilla	2	24	1	13	3	38	< 1	4	3	22	–	–	2	12	–	–	4	34	–	–	< 1	4	–	–	–	–	–	–	–
Antigua & Barbuda	6	10	3	5	10	16	1	2	5	5	–	–	2	2	–	–	7	9	–	–	< 1	< 1	–	–	–	1.1	11	< 1	< 1
Argentina	19 442	60	10 649	33	31 223	96	2 602	8	12 172	31	923	2	6 602	17	415	1	13 914	35	462	1	1 759	4	196	< 1	7.6	2.2	15	394	272
Bahamas	113	44	47	18	138	54	28	11	146	44	43	13	62	19	15	5	168	51	22	7	30	9	14	4	30	1.2	11	3	2
Barbados	19	7	8	3	22	8	4	1	11	4	2	< 1	5	2	< 1	< 1	10	3	< 1	< 1	< 1	< 1	< 1	< 1	17	–	–	–	–
Belize	74	40	41	22	121	65	16	8	115	40	24	8	61	21	11	4	131	46	12	4	20	7	7	2	21	1.5	10	3	2
Bermuda	4	7	2	3	6	10	< 1	< 1	2	4	–	–	1	2	–	–	4	6	–	–	< 1	< 1	–	–	–	–	–	–	–
Bolivia	16 972	255	9 328	140	25 170	377	2 978	45	14 725	155	434	5	8 055	85	196	2	18 840	198	217	2	2 381	25	122	1	3.0	1.2	4.7	234	154
Brazil	125 064	84	67 773	45	186 010	124	10 881	7	92 102	48	13 019	7	49 354	26	5 859	3	114 417	60	6 509	3	8 419	4	2 473	1	14	0.9	5.4	1 443	1 056
British Virgin Islands	3	19	2	11	5	32	< 1	4	2	10	–	–	1	6	–	–	4	16	–	–	< 1	2	–	–	–	–	–	–	–
Canada	2 647	10	1 183	4	2 036	7	264	< 1	1 669	5	95	< 1	741	2	33	< 1	1 326	4	47	< 1	175	< 1	11	< 1	5.7	0.8	7.5	24	16
Cayman Islands	2	7	< 1	3	3	10	< 1	1	2	4	–	–	< 1	2	–	–	2	5	–	–	< 1	< 1	–	–	–	–	–	–	–
Chile	4 962	38	2 727	21	5 913	45	558	4	2 038	12	96	< 1	1 111	7	43	< 1	2 009	12	48	< 1	170	1	8	< 1	4.7	0.7	3.8	22	15
Colombia	18 440	53	10 128	29	30 585	88	3 245	9	16 333	35	945	2	8 889	19	425	< 1	19 831	43	473	1	2 474	5	234	< 1	5.8	1.5	10	310	201
Costa Rica	557	18	306	10	911	30	100	3	491	11	27	< 1	268	6	12	< 1	480	11	13	< 1	39	< 1	3	< 1	5.5	1.5	4.8	9	6
Cuba	2 695	25	1 482	14	3 353	32	321	3	724	6	14	< 1	397	4	6	< 1	739	7	7	< 1	60	< 1	2	< 1	2.0	< 0.05	5.3	3	3
Dominica	10	15	6	8	17	24	2	3	9	13	–	–	5	7	–	–	13	19	–	–	1	2	–	–	–	1.3	11	< 1	< 1
Dominican Republic	8 323	114	4 514	62	13 321	183	1 986	27	6 764	69	1 027	11	3 618	37	462	5	8 045	82	514	5	1 296	13	299	3	15	6.6	20	646	438
Ecuador	17 133	167	9 387	91	28 981	282	4 173	41	13 517	101	1 222	9	7 312	55	550	4	18 642	140	611	5	3 013	23	454	3	9.0	4.9	24	1 283	978
El Salvador	4 204	82	2 306	45	6 815	133	758	15	2 715	40	357	5	1 458	21	161	2	3 284	48	179	3	494	7	99	1	13	0.3	7.0	22	18
Grenada	4	5	2	3	7	7	< 1	< 1	4	4	–	–	2	2	–	–	7	6	–	–	< 1	< 1	–	–	–	–	–	–	–
Guatemala	6 633	74	3 645	41	10 104	113	1 189	13	8 479	63	816	6	4 582	34	367	3	11 575	87	408	3	1 619	12	258	2	10	3.0	26	374	257
Guyana	196	27	105	14	288	39	43	6	898	122	233	32	471	64	105	14	1 004	136	117	16	174	24	62	8	26	1.7	9.1	23	15
Haiti	21 729	306	11 684	164	34 062	479	5 754	81	29 333	306	6 713	70	15 462	161	3 021	31	35 099	366	3 357	35	6 814	71	2 279	24	23	1.8	9.3	595	342
Honduras	4 779	98	2 554	52	6 872	141	808	17	4 218	59	440	6	2 276	32	198	3	5 048	71	220	3	686	10	118	2	10	1.8	12	106	72
Jamaica	155	7	85	4	245	10	27	1	178	7	40	1	94	3	18	< 1	195	7	20	< 1	30	1	11	< 1	23	1.4	8.9	3	2
Mexico	51 481	61	28 207	34	84 578	101	9 173	11	21 283	20	1 017	< 1	11 604	11	458	< 1	24 029	23	509	< 1	2 552	2	209	< 1	4.8	2.4	22	986	754
Montserrat	< 1	9	< 1	5	2	14	< 1	2	< 1	8	–	–	< 1	4	–	–	< 1	8	–	–	< 1	< 1	–	–	–	–	–	–	–
Netherlands Antilles	27	14	12	6	54	28	5	3	14	7	–	–	6	3	–	–	29	15	–	–	3	1	–	–	–	–	–	–	–
Nicaragua	4 458	108	2 450	59	6 012	145	742	18	2 731	49	94	2	1 492	27	42	< 1	3 139	56	47	< 1	334	6	21	< 1	3.5	0.6	7.8	46	38
Panama	1 144	47	623	26	1 787	74	159	7	1 586	47	218	7	851	25	98	3	1 493	45	109	3	139	4	23	< 1	14	1.5	10	48	37
Paraguay	2 560	60	1 407	33	4 018	95	498	12	3 570	58	293	5	1 934	32	132	2	4 495	73	147	2	619	10	83	1	8.2	2.1	3.9	89	54
Peru	69 063	317	37 890	174	85 772	394	7 415	34	35 123	126	2 356	8	19 082	68	1 060	4	37 922	136	1 178	4	4 368	16	428	2	6.7	5.3	24	3 270	2 428
Puerto Rico	385	11	173	5	603	17	68	2	161	4	–	–	72	2	–	–	206	5	–	–	21	< 1	–	–	–	–	–	–	–
Saint Kitts & Nevis	4	10	2	6	7	17	< 1	2	5	9	–	–	3	5	–	–	6	12	–	–	< 1	1	–	–	–	–	–	–	–
Saint Lucia	22	16	12	9	36	26	4	3	24	14	–	–	13	8	–	–	29	18	–	–	3	2	–	–	–	1.4	10	< 1	< 1
St Vincent & Grenadines	30	27	16	15	50	45	6	5	30	25	–	–	16	14	–	–	47	39	–	–	6	5	–	–	–	1.9	17	2	2
Suriname	265	66	145	36	437	109	56	14	533	116	125	27	281	61	56	12	710	155	63	14	131	29	48	10	24	–	–	–	–
Trinidad & Tobago	138	11	62	5	206	17	24	2	150	11	26	2	65	5	9	< 1	199	15	13	< 1	26	2	8	< 1	17	–	–	–	–
Turks & Caicos Islands	3	26	2	14	5	42	< 1	5	3	14	–	–	2	7	–	–	4	17	–	–	< 1	1	–	–	–	–	–	–	–
Uruguay	861	28	472	15	1 075	35	104	3	745	22	111	3	399	12	50	1	775	23	56	2	84	3	18	< 1	15	< 0.05	6.1	3	3
US Virgin Islands	20	19	9	9	31	30	3	3	11	10	–	–	5	5	–	–	18	16	–	–	2	2	–	–	–	–	–	–	–
USA	24 030	9	10 602	4	18 111	7	2 396	< 1	12 718	4	1 483	< 1	5 575	2	519	< 1	9 484	3	741	< 1	1 267	< 1	143	< 1	12	–	–	154	–
Venezuela	6 966	35	3 822	19	9 014	46	1 002	5	9 290	34	1 160	4	4 994	18	522	2	10 662	39	580	2	1 403	5	261	< 1	12	0.5	13	119	97
AMR	**415 623**	**57**	**223 876**	**31**	**598 017**	**82**	**57 395**	**8**	**294 636**	**32**	**33 356**	**4**	**157 225**	**17**	**14 845**	**2**	**348 043**	**38**	**16 678**	**2**	**40 616**	**4**	**7 892**	**< 1**	**11.3**	**2.1**	**14**	**10 214**	**7 261**

– Indicates no estimate.

* Incidence, prevalence and mortality estimates include patients with HIV. Estimates labelled "HIV+" are estimates of HIV+ TB cases in all people. Estimates for all years are re-calculated as new information becomes available and techniques are refined, so they may differ from those published previously. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.3 **Estimated incidence of TB (all forms) in all people, the Americas, 1990–2007**

	Number of cases																	
	1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Anguilla	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3
Antigua & Barbuda	6	6	6	6	6	5	5	5	5	5	5	5	5	5	5	5	5	5
Argentina	19 442	18 962	18 491	18 025	17 566	17 111	16 662	16 218	15 779	15 346	14 919	14 496	14 081	13 674	13 279	12 897	12 528	12 172
Bahamas	113	115	117	119	122	124	126	128	130	132	134	136	138	139	141	143	145	146
Barbados	19	18	17	16	15	15	14	14	13	13	12	12	12	11	11	11	11	11
Belize	74	76	79	81	83	86	88	90	93	95	98	100	103	105	108	110	113	115
Bermuda	4	4	4	4	3	3	3	3	3	3	3	3	3	2	2	2	2	2
Bolivia	16 972	16 867	16 765	16 664	16 558	16 445	16 324	16 196	16 062	15 925	15 787	15 647	15 505	15 359	15 209	15 053	14 892	14 725
Brazil	125 064	123 059	121 003	118 926	116 859	114 824	112 826	110 862	108 926	107 009	105 104	103 213	101 337	99 473	97 619	95 773	93 933	92 102
British Virgin Islands	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2
Canada	2 647	2 529	2 433	2 306	2 233	2 147	2 096	2 048	1 983	1 884	1 818	1 770	1 770	1 716	1 698	1 689	1 679	1 669
Cayman Islands	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Chile	4 962	4 730	4 509	4 298	4 094	3 896	3 703	3 516	3 336	3 163	2 998	2 840	2 689	2 545	2 408	2 278	2 155	2 038
Colombia	18 440	18 356	18 267	18 174	18 077	17 976	17 871	17 762	17 648	17 528	17 402	17 270	17 132	16 986	16 834	16 674	16 507	16 333
Costa Rica	557	554	552	549	546	543	541	539	537	534	531	527	522	517	511	505	498	491
Cuba	2 695	2 505	2 326	2 157	2 000	1 853	1 717	1 590	1 472	1 363	1 261	1 166	1 078	997	921	850	785	724
Dominica	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	9	9
Dominican Republic	8 323	8 239	8 155	8 070	7 984	7 896	7 808	7 718	7 627	7 535	7 441	7 347	7 251	7 154	7 057	6 960	6 862	6 764
Ecuador	17 133	17 016	16 889	16 749	16 592	16 416	16 221	16 010	15 786	15 551	15 308	15 060	14 806	14 550	14 291	14 033	13 774	13 517
El Salvador	4 204	4 099	4 002	3 911	3 823	3 736	3 652	3 568	3 485	3 401	3 315	3 227	3 138	3 050	2 962	2 877	2 795	2 715
Grenada	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Guatemala	6 633	6 725	6 819	6 915	7 011	7 108	7 205	7 302	7 402	7 505	7 614	7 728	7 847	7 970	8 096	8 223	8 351	8 479
Guyana	196	225	189	250	303	408	473	483	526	533	581	666	764	848	871	908	904	898
Haiti	21 729	22 172	22 614	23 057	23 501	23 947	24 397	24 850	25 303	25 754	26 201	26 643	27 082	27 520	27 962	28 412	28 869	29 333
Honduras	4 779	4 771	4 760	4 745	4 726	4 701	4 670	4 636	4 597	4 557	4 515	4 473	4 430	4 387	4 344	4 301	4 259	4 218
Jamaica	155	156	158	160	161	163	164	166	167	168	170	171	172	173	175	176	177	178
Mexico	51 481	49 059	46 751	44 553	42 461	40 469	38 578	36 775	35 031	33 315	31 611	29 921	28 261	26 664	25 160	23 766	22 479	21 283
Montserrat	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
Netherlands Antilles	27	25	24	23	22	21	20	19	18	17	16	15	15	15	14	14	14	14
Nicaragua	4 458	4 357	4 262	4 169	4 075	3 977	3 875	3 771	3 665	3 558	3 450	3 342	3 234	3 127	3 023	2 922	2 825	2 731
Panama	1 144	1 167	1 192	1 216	1 241	1 267	1 293	1 319	1 346	1 373	1 400	1 426	1 453	1 480	1 507	1 533	1 560	1 586
Paraguay	2 560	2 621	2 682	2 743	2 803	2 863	2 923	2 983	3 042	3 101	3 160	3 219	3 278	3 337	3 395	3 454	3 512	3 570
Peru	69 063	66 718	64 409	62 135	59 893	57 683	55 509	53 376	51 289	49 253	47 273	45 350	43 488	41 687	39 950	38 278	36 669	35 123
Puerto Rico	385	349	402	420	427	429	420	387	355	310	267	229	197	198	189	188	174	161
Saint Kitts & Nevis	4	4	4	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5
Saint Lucia	22	22	22	22	22	22	22	23	23	23	23	23	23	23	23	23	23	24
St Vincent & Grenadines	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Suriname	265	249	199	207	200	211	241	284	340	357	344	347	355	384	410	453	493	533
Trinidad & Tobago	138	139	140	141	142	143	144	144	145	146	146	147	147	148	148	149	149	150
Turks & Caicos Islands	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Uruguay	861	856	851	847	842	837	833	828	823	817	810	801	791	781	771	761	753	745
US Virgin Islands	20	19	18	17	16	16	15	15	14	14	13	13	12	12	12	12	11	11
USA	24 030	25 049	24 867	24 211	22 954	21 715	20 296	18 881	17 697	16 600	15 853	15 073	14 604	14 143	13 833	13 495	13 112	12 718
Venezuela	6 966	7 114	7 258	7 401	7 542	7 682	7 821	7 959	8 096	8 232	8 367	8 501	8 634	8 767	8 899	9 030	9 161	9 290
AMR	**415 623**	**408 987**	**401 292**	**393 343**	**384 962**	**376 797**	**368 617**	**360 528**	**352 823**	**345 176**	**338 008**	**330 965**	**324 415**	**318 006**	**311 897**	**306 017**	**300 239**	**294 636**

	Rate (per 100 000 population)																	
	1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Anguilla	24	24	24	24	23	23	23	23	23	23	23	22	22	22	22	22	22	22
Antigua & Barbuda	10	10	9	9	8	8	8	7	7	7	6	6	6	6	6	6	6	5
Argentina	60	57	55	53	51	49	47	45	44	42	40	39	37	36	35	33	32	31
Bahamas	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44
Barbados	7	6	6	6	6	5	5	5	5	4	4	4	4	4	4	4	4	4
Belize	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Bermuda	7	6	6	6	6	5	5	5	5	4	4	4	4	4	4	4	4	4
Bolivia	255	247	240	233	226	220	213	207	201	195	190	184	179	174	169	164	159	155
Brazil	84	81	78	76	73	71	69	67	64	62	60	58	57	55	53	51	50	48
British Virgin Islands	19	18	17	16	15	15	14	14	13	12	12	11	11	11	11	11	10	10
Canada	10	9	9	8	8	7	7	7	7	6	6	6	6	5	5	5	5	5
Cayman Islands	7	6	6	6	6	5	5	5	5	4	4	4	4	4	4	4	4	4
Chile	38	35	33	31	29	27	25	24	22	21	19	18	17	16	15	14	13	12
Colombia	53	52	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35
Costa Rica	18	18	17	17	16	16	15	15	14	14	14	13	13	12	12	12	11	11
Cuba	25	23	22	20	18	17	16	14	13	12	11	10	10	9	8	8	7	6
Dominica	15	15	15	14	14	14	14	14	14	14	14	14	14	14	14	13	13	13
Dominican Republic	114	111	108	104	101	99	96	93	90	88	85	83	80	78	76	73	71	69
Ecuador	167	162	157	153	148	144	140	136	132	128	124	121	117	114	111	107	104	101
El Salvador	82	79	75	72	69	66	64	61	58	56	54	51	49	47	45	43	41	40
Grenada	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4
Guatemala	74	74	73	72	72	71	70	70	69	68	68	67	67	66	65	65	64	63
Guyana	27	31	26	34	41	55	64	65	71	73	79	91	104	115	118	123	122	122
Haiti	306	306	306	306	306	306	306	306	306	306	306	306	306	306	306	306	306	306
Honduras	98	95	92	89	87	84	82	80	77	75	73	71	69	67	65	63	61	59
Jamaica	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Mexico	61	57	54	50	47	44	41	39	36	34	32	30	28	26	24	23	21	20
Montserrat	9	9	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8
Netherlands Antilles	14	13	13	12	11	11	10	10	10	9	9	8	8	8	8	8	8	7
Nicaragua	108	103	98	94	89	85	81	78	74	71	68	64	62	59	56	53	51	49
Panama	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47
Paraguay	60	60	60	60	60	60	60	59	59	59	59	59	59	59	59	58	58	58
Peru	317	301	285	270	255	242	229	217	205	195	184	174	165	156	148	140	133	126
Puerto Rico	11	10	11	12	12	12	11	10	9	8	7	6	5	5	5	5	4	4
Saint Kitts & Nevis	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9
Saint Lucia	16	16	16	16	15	15	15	15	15	15	15	15	15	15	15	14	14	14
St Vincent & Grenadines	27	27	27	27	27	27	26	26	26	26	26	26	25	25	25	25	25	25
Suriname	66	61	49	51	49	51	58	67	79	83	79	79	80	86	91	100	108	116
Trinidad & Tobago	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Turks & Caicos Islands	26	24	23	22	21	20	19	18	18	17	16	15	15	15	14	14	14	14
Uruguay	28	27	27	27	26	26	26	25	25	25	24	24	24	23	23	23	23	22
US Virgin Islands	19	18	17	16	15	15	14	14	13	12	12	11	11	11	11	10	10	10
USA	9	10	10	9	9	8	7	7	6	6	6	5	5	5	5	5	4	4
Venezuela	35	35	35	35	35	35	35	35	34	34	34	34	34	34	34	34	34	34
AMR	**57**	**55**	**54**	**52**	**50**	**48**	**46**	**45**	**43**	**42**	**40**	**39**	**38**	**37**	**35**	**34**	**33**	**32**

Estimates for all years are re-calculated as new information becomes available and techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.4 **Estimated incidence, prevalence and mortality rates (per 100 000 population), the Americas, 2000–2007**

	Incidence of HIV+ TB cases								Prevalence of TB (all forms)								Mortality (excluding HIV+)								Mortality HIV+							
	2000	2001	2002	2003	2004	2005	2006	2007	2000	2001	2002	2003	2004	2005	2006	2007	2000	2001	2002	2003	2004	2005	2006	2007	2000	2001	2002	2003	2004	2005	2006	2007
Anguilla	–	–	–	–	–	–	–	–	35	35	35	35	35	34	34	34	4	4	4	4	4	4	4	4	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Antigua & Barbuda	–	–	–	–	–	–	–	–	8	9	7	9	8	8	9	9	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Argentina	3	3	3	3	3	2	2	2	52	51	42	41	39	39	37	35	5	5	5	4	4	4	4	4	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Bahamas	13	13	13	13	13	13	13	13	45	45	51	51	50	50	50	51	3	3	5	5	5	5	5	5	3	3	4	4	4	4	4	4
Barbados	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	5	4	4	4	4	4	3	3	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Belize	8	8	8	8	8	8	8	8	39	36	36	40	42	38	41	46	4	3	2	3	5	3	3	5	1	< 1	< 1	1	2	1	2	2
Bermuda	–	–	–	–	–	–	–	–	7	6	6	6	6	6	6	6	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Bolivia	5	5	5	5	5	5	5	5	238	229	223	218	211	205	202	198	29	27	26	26	25	24	24	24	1	1	1	1	1	1	1	1
Brazil	8	8	8	8	7	7	7	7	83	80	77	72	63	60	56	60	4	4	4	4	4	4	3	3	2	2	2	1	1	1	1	1
British Virgin Islands	–	–	–	–	–	–	–	–	19	18	18	17	16	17	16	16	2	2	2	2	2	2	2	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Canada	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	5	4	4	4	4	4	4	4	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cayman Islands	–	–	–	–	–	–	–	–	7	5	6	6	5	5	6	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chile	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	21	19	19	18	15	15	13	12	2	2	2	2	1	2	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Colombia	2	2	2	2	2	2	2	2	51	62	60	58	55	53	44	43	6	7	6	6	6	6	5	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Costa Rica	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	14	14	15	14	12	12	12	11	1	1	1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cuba	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	13	12	11	10	9	8	8	7	1	1	1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Dominica	–	–	–	–	–	–	–	–	20	22	20	20	20	21	13	19	2	3	2	2	2	3	1	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Dominican Republic	15	14	14	13	12	12	11	11	119	115	102	93	90	85	84	82	15	15	13	12	11	10	10	10	6	6	4	4	4	3	3	3
Ecuador	9	9	9	9	9	9	9	9	194	185	170	162	155	155	148	140	27	26	24	22	21	22	20	19	4	4	4	4	4	4	4	3
El Salvador	6	6	6	6	6	6	5	5	69	66	62	60	57	52	50	48	8	8	7	7	7	6	6	6	2	2	2	2	2	2	2	1
Grenada	–	–	–	–	–	–	–	–	7	7	7	7	7	7	7	6	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Guatemala	6	7	7	7	7	6	6	6	90	91	89	89	86	85	84	87	11	11	10	10	10	10	10	10	2	2	2	2	2	2	2	2
Guyana	21	23	27	29	30	31	31	32	98	112	126	136	130	132	133	136	11	13	14	15	15	15	14	15	7	8	8	9	7	7	8	8
Haiti	66	67	68	68	68	69	69	70	403	397	388	380	377	368	368	366	53	52	51	50	49	48	48	47	26	26	25	24	24	23	23	24
Honduras	10	9	9	8	7	7	7	6	70	70	72	71	72	71	70	71	5	5	6	8	8	8	8	8	1	1	2	2	2	2	2	2
Jamaica	1	1	1	1	1	1	1	1	7	7	7	7	7	7	7	7	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Mexico	1	1	1	1	1	1	1	< 1	42	38	35	33	31	27	25	23	5	4	4	4	3	3	3	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Montserrat	–	–	–	–	–	–	–	–	13	13	13	10	13	10	12	8	2	2	2	< 1	2	< 1	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Netherlands Antilles	–	–	–	–	–	–	–	–	17	17	17	16	16	15	15	15	2	1	1	2	1	1	1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Nicaragua	1	1	1	2	2	2	2	2	85	80	79	73	69	68	64	56	11	10	10	9	9	9	8	6	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Panama	6	6	6	6	6	6	6	7	60	51	48	49	44	44	44	45	6	5	4	4	3	3	3	3	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Paraguay	3	3	3	4	4	4	5	5	90	89	88	85	85	81	74	73	11	11	11	11	10	10	9	9	1	1	1	1	1	1	1	1
Peru	10	10	10	9	9	9	9	8	210	198	187	182	167	155	143	136	22	20	19	19	17	16	14	14	2	2	2	2	2	2	2	2
Puerto Rico	–	–	–	–	–	–	–	–	9	8	7	6	6	6	6	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Saint Kitts & Nevis	–	–	–	–	–	–	–	–	15	13	12	14	13	15	14	12	2	2	1	2	2	2	2	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Saint Lucia	–	–	–	–	–	–	–	–	20	18	17	19	18	18	18	18	2	2	2	2	2	2	2	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
St Vincent & Grenadines	–	–	–	–	–	–	–	–	35	36	36	34	36	36	34	39	4	4	4	4	4	4	4	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Suriname	10	11	13	15	18	21	24	27	115	113	113	120	126	136	146	155	14	14	14	15	15	16	17	18	4	4	5	6	7	8	9	10
Trinidad & Tobago	2	2	2	2	2	2	2	2	15	16	15	15	15	15	15	15	1	1	2	1	1	1	1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Turks & Caicos Islands	–	–	–	–	–	–	–	–	16	23	23	22	22	22	18	17	1	3	2	2	2	2	2	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Uruguay	–	–	–	–	–	–	–	–	19	18	18	17	17	16	16	16	2	2	2	2	2	2	2	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
US Virgin Islands	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	4	4	4	4	3	3	3	3	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
USA	2	2	3	3	3	3	3	3	27	25	27	25	23	24	25	23	3	2	2	2	2	2	2	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Venezuela	3	3	3	3	4	4	4	4	39	41	41	39	38	38	38	39	4	4	4	4	4	4	4	4	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
AMR	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**51**	**50**	**48**	**46**	**43**	**41**	**38**	**38**	**5**	**5**	**5**	**4**	**4**	**4**	**4**	**4**	**1**	**1**	**< 1**	**< 1**	**< 1**	**< 1**	**< 1**	**< 1**

Rates are per 100 000 population (total country population, including HIV-positive and HIV-negative people). Estimates for all years are re-calculated as new information becomes available and techniques are refined, so they may differ from those published previously. Data (including for years 1990 to 1999) can be downloaded from www.who.int/tb

Table A3.5 **Case notifications and case detection rates, DOTS and non-DOTS combined, the Americas, 2007**

	Notified TB cases, DOTS and non-DOTS combined															Estimated incidence and case detection rates				Proportions			
					New pulmonary		New extra-	Other	Re-treatment cases						New pulm.	Estimated incidence		Case detection rate		ss+	ss+	Extrapulm.	Re-treat.
	Population	All notified	New and relapse		ss+		ss- / unk.	new	Relapse	After failure	After default	Other re-treat.		Other	lab. confirm.	all forms	ss+	all new	new ss+	(% of	(% of	(% of	(% of
	thousands	number	number	rate	number	rate	number	pulmonary number	number	number	number	number	number	number	number	number	number	%	%	pulm.)	new+relapse)	new+relapse)	new+re-treat.)
Anguilla	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	0				
Antigua & Barbuda	85	2	2	2	2	2	0	0	0	0	0	0	0	0	2	5	2	43	95	100	100		
Argentina	39 531	10 683	9 755	25	4 985	13	3 103	1 444	61	162	0	0	456	472	5 411	12 172	6 602	79	76	62	51	15	6
Bahamas	331	48	46	14	32	10	6	7	0	1	1	0	1	0	38	146	62	31	52	84	70	15	6
Barbados	294	16	16	5	8	3	0	8	0	0	0	0	0	0	8	11	5	150	173	100	50	50	
Belize	288	63	63	22	54	19	0	2	0	7					63	115	61	49	89	100	86	3	11
Bermuda	65															2	1						
Bolivia	9 525	8 701	8 574	90	5 686	60	861	1 502		525	23	104				14 725	8 055	55	71	87	66	18	7
Brazil	191 791	80 461	74 757	39	38 444	20	23 065	10 318	0	2 930	223	2 351	3 130	0	40 793	92 102	49 354	78	78	63	51	14	11
British Virgin Islands	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0				
Canada	32 876	1 547	1 476	4	463	1	449	484	0	80	0	0	29	42	808	1 669	741	84	62	51	31	33	7
Cayman Islands	47	3	1	2	1	2	0	0	0	0	0	0	2	0	1	2	1	58	129	100	100		67
Chile	16 635	2 492	2 418	15	1 166	7	496	604	0	152	6	23	45	0	1 469	2 038	1 111	111	105	70	48	25	9
Colombia	46 156	10 950	10 950	24	7 188	16	1 636	1 703	0	423					8 029	16 333	8 889	64	81	81	66	16	4
Costa Rica	4 468	565	550	12	322	7	110	91	0	27	1	14	0	0	322	491	268	106	120	75	59	17	7
Cuba	11 268	773	762	7	432	4	184	98		48	8	3			432	724	397	99	109	70	57	13	8
Dominica	67	3	3	4	3	4	0	0	0	0	0	0	0	0	3	9	5	33	61	100	100		
Dominican Republic	9 760	4 361	4 150	43	2 373	24	830	593		354	13	198	0	0	2 414	6 764	3 618	56	66	74	57	14	13
Ecuador	13 341	5 262	4 877	37	3 448	26	480	503	0	446	88	210	87	0	3 493	13 517	7 312	33	47	88	71	10	16
El Salvador	6 857	1 692	1 666	24	942	14	358	306	0	60	8	18	0	0	942	2 715	1 458	59	65	72	57	18	5
Grenada	106	3	3	3	3	3	0	0	0	0	0	0	0	0	3	4	2	68	123	100	100		
Guatemala	13 354	3 203	3 140	24	2 348	18	376	282	0	134	18	45	0	0	3 398	8 479	4 582	35	51	86	75	9	6
Guyana	738	656	594	80	233	32	301	43	1	16	10	46	6	0	519	898	471	64	49	44	39	7	12
Haiti	9 598	14 198	14 133	147	7 915	82	4 472	1 437	0	309	19	46	0	0	7 915	29 333	15 462	47	51	64	56	10	3
Honduras	7 106	2 961	2 772	39	1 974	28	470	328	0	0	0	0	189	0	1 974	4 218	2 276	66	87	81	71	12	6
Jamaica	2 714	104	104	4	78	3	20	4	0	2	0	0	0	0	96	178	94	57	83	80	75	4	2
Mexico	106 535	19 385	18 324	17	11 531	11	3 213	2 869	0	711	101	485	359	116	11 682	21 283	11 604	83	99	78	63	16	9
Montserrat	6	2	2	34	1	17	1	0	0	0	0	0	0		1	0	0	432	393	50	50		
Netherlands Antilles	192															14	6						
Nicaragua	5 603	2 441	2 303	41	1 453	26	455	237	0	158	88	50	0	0	1 453	2 731	1 492	79	97	76	63	10	12
Panama	3 343	1 773	1 596	48	833	25	470	242	0	51	7	50	120	0	833	1 586	851	97	98	64	52	15	13
Paraguay	6 127	2 420	2 269	37	1 276	21	686	215	6	86	1	37	39	74	1 282	3 570	1 934	61	66	65	56	9	7
Peru	27 903	34 534	32 407	116	17 796	64	5 510	5 312	775	3 014	713	489	925	0	18 571	35 123	19 082	84	93	76	55	16	15
Puerto Rico	3 991	98	98	2	56	1	29	13	0	0	0	0	0	0	85	161	72	61	77	66	57	13	
Saint Kitts & Nevis	50	4	4	8	4	8	0	0	0	0	0	0	0	0	4	5	3	85	155	100	100		
Saint Lucia	165	19	19	12	18	11	0	0	0	1	0	0	0	0	17	24	13	76	139	100	95		5
St Vincent & Grenadines	120	18	12	10	4	3	8	0	0	0	0	6	0	0	4	30	16	40	24	33	33		33
Suriname	458															533	281						
Trinidad & Tobago	1 333	260	218	16	130	10	59	17	2	10	3	39			260	150	65	139	201	69	60	8	20
Turks & Caicos Islands	26															3	2						
Uruguay	3 340	616	607	18	380	11	132	57	0	38	2	0	7	0	420	745	399	76	95	74	63	9	8
US Virgin Islands	111															11	5						
USA	305 826	13 299	13 299	4	4 864	2	5 726	2 697	12	0	0	0	0	0	8 828	12 718	5 575	105	87	46	37	20	
Venezuela	27 657	6 559	6 456	23	3 392	12	1 535	1 148	133	248	13	90	0	0	3 525	9 290	4 994	67	68	69	53	18	5
AMR	**909 820**	**230 175**	**218 426**	**24**	**119 838**	**13**	**55 041**	**32564**	**990**	**9 993**	**1 346**	**4 304**	**5 395**	**704**	**125 098**	**294 636**	**157 225**	**71**	**76**	**69**	**55**	**15**	**9**

ss+ indicates sputum smear-positive; ss-, sputum smear-negative; unk., sputum smear result unknown; re-treat., re-treatment; pulm. lab. confirmed, pulmonary case confirmed by positive smear or culture. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.6 **DOTS coverage, case notifications and case detection rates, the Americas, 2007**

	DOTS coverage	TB cases reported from DOTS services													Estimated incidence and case detection rate				Proportions			
		New and relapse		New pulmonary ss+		New pulmonary ss- / unk.	New extra-pulmonary	Other new	Re-treatment cases: Relapse	Re-treatment cases: After failure	Re-treatment cases: After default	Re-treatment cases: Other re-treat.	Other	New pulm. lab. confirm.	Estimated incidence: all forms	Estimated incidence: ss+	DOTS case detection rate: all new	DOTS case detection rate: new ss+	ss+ (% of pulm.)	ss+ (% of new+relapse)	Extrapulm. (% of new+relapse)	Re-treat. (% of new+re-treat.)
	%	number	rate	number	rate	number	number	number	number	number	number	number	number	number	number	number	%	%				
Anguilla	0	0	0												3	2						
Antigua & Barbuda	0														5	2						
Argentina	100	9 755	25	4 985	13	3 103	1 444	61	162			456	472	5 411	12 172	6 602	79	76	62	51	15	6
Bahamas	100	46	14	32	10	6	7	0	1	1	0	1	0	38	146	62	31	52	84	70	15	6
Barbados	100	16	5	8	3	0	8	0	0	0	0	0	0	8	11	5	150	173	100	50	50	
Belize	100	63	22	54	19	0	2	0	7					63	115	61	49	89	100	86	3	11
Bermuda															2	1						
Bolivia	100	8 574	90	5 686	60	861	1 502		525	23	104				14 725	8 055	55	71	87	66	18	7
Brazil	75	66 759	35	34 211	18	20 566	9 318	0	2 664	217	2 186	2 821	0	36 349	92 102	49 354	70	69	62	51	14	11
British Virgin Islands	0														2	1						
Canada	100	1 476	4	463	1	449	484	0	80	0	0	29	42	808	1 669	741	84	62	51	31	33	7
Cayman Islands	100	1	2	1	2	0	0	0	0	0	0	2	0	1	2	1	58	129	100	100		67
Chile	100	2 418	15	1 166	7	496	604	0	152	6	23	45	0	1 469	2 038	1 111	111	105	70	48	25	9
Colombia	70	10 950	24	7 188	16	1 636	1 703	0	423					8 029	16 333	8 889	64	81	81	66	16	4
Costa Rica	100	550	12	322	7	110	91	0	27	1	14	0	0	322	491	268	106	120	75	59	17	7
Cuba	100	762	7	432	4	184	98		48	8	3			432	724	397	99	109	70	57	13	8
Dominica	100	3	4	3	4	0	0	0	0	0	0	0	0	3	9	5	33	61	100	100		
Dominican Republic	85	4 150	43	2 373	24	830	593		354	13	198	0	0	2 414	6 764	3 618	56	66	74	57	14	13
Ecuador	96	4 698	35	3 332	25	449	481	0	436	85	202	86	0	3 377	13 517	7 312	32	46	88	71	10	16
El Salvador	100	1 666	24	942	14	358	306	0	60	8	18	0	0	942	2 715	1 458	59	65	72	57	18	5
Grenada	0														4	2						
Guatemala	70	2 620	20	1 838	14	376	272	0	134	18	45	0	0	2 818	8 479	4 582	29	40	83	70	10	7
Guyana	70	444	60	183	25	215	32	1	13	4	35	4	0	397	898	471	48	39	46	41	7	11
Haiti	70	13 632	142	7 594	79	4 354	1 391	0	293	18	35	0	0	7 594	29 333	15 462	45	49	64	56	10	3
Honduras	100	2 772	39	1 974	28	470	328	0	0	0	0	189	0	1 974	4 218	2 276	66	87	81	71	12	6
Jamaica	100	104	4	78	3	20	4	0	2	0	0	0	0	96	178	94	57	83	80	75	4	2
Mexico	96	18 324	17	11 531	11	3 213	2 869	0	711	101	485	359	116	11 682	21 283	11 604	83	99	78	63	16	9
Montserrat	100	2	34	1	17	1	0	0	0	0	0	0		1	0	0	432	393	50	50		
Netherlands Antilles															14	6						
Nicaragua	100	2 303	41	1 453	26	455	237	0	158	88	50	0	0	1 453	2 731	1 492	79	97	76	63	10	12
Panama	99	1 596	48	833	25	470	242	0	51	7	50	120	0	833	1 586	851	97	98	64	52	15	13
Paraguay	90	1 845	30	1 114	18	499	146	4	82	1	32	32	58	1 118	3 570	1 934	49	58	69	60	8	8
Peru	100	32 407	116	17 796	64	5 510	5 312	775	3 014	713	489	925	0	18 571	35 123	19 082	84	93	76	55	16	15
Puerto Rico	100	98	2	56	1	29	13	0	0	0	0	0	0	85	161	72	61	77	66	57	13	
Saint Kitts & Nevis	100	4	8	4	8	0	0	0	0	0	0	0	0	4	5	3	85	155	100	100		
Saint Lucia	100	19	12	18	11	0	0	0	1	0	0	0	0	17	24	13	76	139	100	95		5
St Vincent & Grenadines	0														30	16						
Suriname															533	281						
Trinidad & Tobago	0														150	65						
Turks & Caicos Islands															3	2						
Uruguay	100	607	18	380	11	132	57	0	38	2	0	7	0	420	745	399	76	95	74	63	9	8
US Virgin Islands															11	5						
USA	100	13 299	4	4 864	2	5 726	2 697	12	0	0	0	0	0	8 828	12 718	5 575	105	87	46	37	20	
Venezuela	100	6 456	23	3 392	12	1 535	1 148	133	248	13	90	0	0	3 525	9 290	4 994	67	68	69	53	18	5
AMR	**91**	**208 419**	**23**	**114 307**	**13**	**52 053**	**31 389**	**986**	**9 684**	**1 327**	**4 059**	**5 076**	**688**	**119 082**	**294 636**	**157 225**	**67**	**73**	**69**	**55**	**15**	**9**

ss+ indicates sputum smear-positive; ss-, sputum smear-negative; unk., sputum smear result unknown; re-treat., re-treatment; pulm. lab. confirmed, pulmonary case confirmed by positive smear or culture. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.7 **Laboratory services, collaborative TB/HIV activities and management of MDR-TB, the Americas, 2006–2007**

	Laboratory services, 2007				Collaborative TB/HIV activities								Management of MDR-TB, 2007				
					2006				2007								
	Number of labs working with NTP			Smear labs included in EQA	TB pts tested for HIV	TB pts HIV-positive	HIV+ TB pts CPT	HIV+ TB pts ART	TB pts tested for HIV	TB pts HIV-positive	HIV+ TB pts CPT	HIV+ TB pts ART	Lab-confirmed MDR	DST in new cases	MDR in new cases	Re-treatment DST	Re-treatment MDR
	smear	culture	DST														
Anguilla					0	0	0	0	0	0	0	0	0	0	0	0	0
Antigua & Barbuda	6	0	0	0	4	3	3	3	2	0	0	0	0	0	0	0	0
Argentina	688	116	19	199	229	221			326	314							
Bahamas	3	2	2	2	61	33			43	13	0	3	0	35	0	2	0
Barbados	1	1			5	2	2	2	8	2	2	2	8	8	0	0	0
Belize	6	0	0		84	10	1	5	63	10	10	9			0		
Bermuda					2	0	0	0									
Bolivia	454	8	2	456					360	3		1	35	0	0		
Brazil	4 044	193	38	1 819	52 115	7 792	0	7 792	57 593	8 141	0	8 141	832	336	275	656	557
British Virgin Islands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Canada	10	10	10	10	441	62			495	56			10	1 113	7	84	3
Cayman Islands	4			4	0	0	0	0	3	0	0	0	0	1	0	2	0
Chile	285	50	1	195	61	61							7	98	2	236	5
Colombia	2 932	867	4	2 651	7 828	453	0	362	6 149	505	0	404	111	200	8	335	103
Costa Rica	98	27	1	82	345	38	0		550	41	0		1		1		
Cuba	480	15	1	480	66	4	0	16	51	1	0	13	3	118	1	14	2
Dominica	2	0	0		4	0	0	0	1	0	0	0	0	0	0	0	0
Dominican Republic	182	6	1	161	1 771	218			1 864	322							
Ecuador	310	10	1	310	0	392	0		1 993	150	0		275	140	10	576	265
El Salvador	200	10	1	198	1 631	176	22	63	1 566	206	107	77	1	457	0	81	1
Grenada	1	0	0	1	1	0	0	0									
Guatemala	181	11	1	35	960	142			426	53			23	0	0	0	0
Guyana	14	1	0	14	566	75	28	24	562	159	40	69	8	0	0	8	2
Haiti	247	0	0		5 996	1 584			8 464	1 937	684	238	39	0	0	0	39
Honduras	148	4	1	101	1 787	202		383	1 753	183			4	0	0	78	4
Jamaica	3	1	1	6	81	25	16	18	86	19	12	12	0	0			0
Mexico	1 153	56	14	555	1 047	540			1 550	561			77				
Montserrat	1	1		1									0	0	0	0	0
Netherlands Antilles					1	1											
Nicaragua	177	3	1	1	0	0	0	0	0	0	0	0	8	200	8	237	0
Panama	58	8	1	58	1 854	270		56	1 770	243		61	5	20	5	15	0
Paraguay	99	6	1	72	47	47			67	67			5	184	1	33	4
Peru	1 534	60	6	1 498	5 200	31	0	15	15 149	112	0	24	945	171	114	1 198	831
Puerto Rico					101	20	6	10	92	21	5	9	2	87	2	0	0
Saint Kitts & Nevis	1	0	0	1		0			2	2			0	0	0	0	0
Saint Lucia	2	0	0	2	15	0		0	18	1	1	1	0	0	0	0	0
St Vincent & Grenadines	1	1	1	1	20	5	5	2	18	7	7	5	0	0	0	0	0
Suriname						24											
Trinidad & Tobago	1	1	1	1	250	13	13	36	260	78	11	12	0	208	0	40	0
Turks & Caicos Islands					8	0	0	0									
Uruguay	1	1	1	1	539	81	0	22	584	87	0	19	1	392	0	33	1
US Virgin Islands																	
USA					8 234	960			8 142	882			119	9 274	98	479	19
Venezuela	547	18	1	125	3 224	400	0	188	3 549	443	0	159	3	19	0	76	3
AMR	**13 874**	**1 487**	**111**	**9 040**	**94 578**	**13 885**	**96**	**8 997**	**113 559**	**14 619**	**879**	**9 259**	**2 522**	**13 061**	**532**	**4 183**	**1 839**

ART indicates antiretroviral therapy; CPT, co-trimoxazole preventive therapy; DST, drug susceptibility testing; EQA, external quality assurance; HIV+, HIV-positive; pts, patients. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.8 **Treatment outcomes, the Americas, 2006 cohort**

	New smear-positive cases, DOTS											New smear-positive cases, non-DOTS											Smear-positive re-treatment cases, DOTS								
	Number of cases		% of notif regist'd	% of cohort							%	Number of cases		% of notif regist'd	% of cohort							%	Number	% of cohort							%
	Notified	Regist'd		Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	Success	Notified	Regist'd		Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	Success	Regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	Success
Anguilla																															
Antigua & Barbuda												4																			
Argentina	4 834	4 622	96	24	40	6	0	8	3	20	63												750	11	31	6	1	13	5	33	43
Bahamas	0	40		0	75	20	5	0	0	0	75												5	0	20	20	40	20	0	0	20
Barbados	4	5	125	100	0	0	0	0	0	0	100												0							0	
Belize	60																														
Bermuda												2																			
Bolivia	5 788	5 642	97	81	2	3	1	6	4	3	83												694	66	4	5	2	10	4	9	70
Brazil	32 463	34 818	107	33	39	4	0	8	3	12	72	8 654	13 487	156	25	50	4	0	10	3	7	76	4 955	15	28	6	2	16	11	23	43
British Virgin Islands																															
Canada	407	411	101	6	51	7	0	1	1	34	57												130	8	41	10	0	3	1	38	48
Cayman Islands	0	0																					0							0	
Chile	1 533	1 142	74	85		7	0	7	0	0	85												100	47	19	10	2	14	1	7	66
Colombia	7 648	7 648	100	62	9	6	1	8	14	0	71																				
Costa Rica	285	296	104	83	5	3	2	4	3	0	88												34	59	9	9	3	21	0	0	68
Cuba	432	431	100	87	3	7	1	3	0	0	90												59	66	17	8	0	5	3	0	83
Dominica	8	8	100	25	25				50	0	50																				
Dominican Republic	2 515	2 356	94	73	5	3	1	6	2	10	78	143											428	43	5	5	6	20	3	19	48
Ecuador	2 610	2 610	100	71	3	3	2	7	1	13	74	572	572	100	1	1	0	0	0	0	99	1	616	54	12	6	8	15	2	4	66
El Salvador	913	913	100	90	1	4	2	3	0	0	91												136	76	0	4	4	7	0	9	76
Grenada												1																			
Guatemala	2 501	2 501	100	42	4	3	1	4	1	44	47																				
Guyana	239	224	94	4	63	4	1	25	3	0	68	55	56	102	4	45	4		38	11	0	48	56	5	27	2	4	43	2	18	32
Haiti	6 873	6 873	100	74	8	5	1	7	3	1	82	588	588	100	63	9	9	1	13	3	3	72	269	58	6	9	6	13	5	3	64
Honduras	2 018	1 944	96	78	7	5	0	5	4	0	86												153	66	5	10	1	12	5	0	71
Jamaica	61	61	100	8	33	18	0	39	2	0	41												5	0	80	0	0	20	0	0	80
Mexico	11 874	11 564	97	74	6	6	1	6	2	5	80												1 384	52	7	9	5	14	3	11	59
Montserrat	0																														
Netherlands Antilles												5																			
Nicaragua	1 285	2 504	195	48	41	3	1	5	3	0	89												0							0	
Panama	858	853	99	66	13	6	1	12	1	0	79												285	14	43	15	2	26	1	0	57
Paraguay	1 179	1 179	100	54	30	5		6	2	3	83	273	273	100	14	47	8		18	3	9	62	142	49	22	4	0	8	1	16	71
Peru	19 251	19 251	100	75	3	2	2	3	1	15	78												1 786	70	3	3	3	9	1	10	73
Puerto Rico	69	69	100	80	0	19	0	1	0	0	80												0							0	
Saint Kitts & Nevis	1	2	200		100					0	100																				
Saint Lucia	13	20	154	15	65	20	0	0	0	0	80																				
St Vincent & Grenadines	8												8		25	50	0	13	13		0	75									
Suriname												63																			
Trinidad & Tobago												149	169	113	53	4	12	1	30		0	57									
Turks & Caicos Islands	7																														
Uruguay	305	301	99	82	5	9	0	3	1	0	87												38	74	3	11	0	11	0	3	76
US Virgin Islands																															
USA	5 091	5 140	101		64	9	2		3	23	64																				
Venezuela	3 547	3 497	99	82	0	5	0	11	2	0	82												257	77	0	8	1	11	3	0	77
AMR	**114 680**	**116 925**	**102**	**55**	**20**	**4**	**1**	**6**	**3**	**10**	**75**	**10 509**	**15 153**	**144**	**26**	**46**	**4**	**0**	**10**	**3**	**10**	**72**	**12 282**	**37**	**18**	**6**	**3**	**14**	**6**	**16**	**55**

Not eval. indicates not evaluated (percentage of registered cases for which outcomes were not recorded); success, sum of cured and completed; cases regist'd, the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2006 is used as the denominator for calculating treatment outcomes unless it is less than the sum of outcomes, in which case the sum of outcomes is used. If the number of cases registered is not reported, then the number of cases notified in 2006 is used, or the sum of outcomes if the latter is greater. Data can be downloaded from www.who.int/tb

Table A3.9 **DOTS re-treatment outcomes, the Americas, 2006 cohort**

	Relapse, DOTS									After failure, DOTS									After default, DOTS								
		% of cohort									% of cohort									% of cohort							
	Number regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	% Success	Number regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	% Success	Number regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	% Success
Anguilla																											
Antigua & Barbuda																											
Argentina	100	31	40	15	0	7	0	7	71																		
Bahamas	1	0	100	0	0	0	0	0	100	2	0	0	50	50	0	0	0	0	2	0	0	0	50	50	0	0	0
Barbados	0									0									0								
Belize																											
Bermuda																											
Bolivia																											
Brazil	2 056	25	26	5	1	9	11	23	51	224	5	10	6	18	4	10	46	15	1 542	14	19	6	1	27	13	20	33
British Virgin Islands																											
Canada	76	11	42	8	0	3	0	37	53																		
Cayman Islands	0									0									0								
Chile	100	47	19	10	2	14	1	7	66																		
Colombia																											
Costa Rica	18	72	11	11		6		0	83	1	100						0	100	14	36	7	7	7	43		0	43
Cuba	54	69	19	9			4	0	87	3	33				67		0	33	2	50				50		0	50
Dominica																											
Dominican Republic	238	51	5	5	6	11	1	20	57	19	0	0	5	32	5	0	58	0	171	35	6	4	2	33	5	14	41
Ecuador	338	67	8	4	8	11	1	1	74	70	44	7	7	23	14	1	3	51	136	46	7	7	4	27	4	4	54
El Salvador	101	80	0	5	2	6	0	7	80	17	71	0	0	6	0	0	24	71	18	61	0	0	11	22		6	61
Grenada																											
Guatemala																											
Guyana	26	4	27	4	4	19	4	38	31										27	0	30	0	0	70	0	0	30
Haiti	234	58	6	10	5	12	6	4	64										35	57	9	3	11	17	3	0	66
Honduras																											
Jamaica	2	0	100	0	0	0	0	0	100	0									2	0	50	0	0	50	0	0	50
Mexico	572	57	7	8	5	11	2	10	64	59	36	0	7	15	14	3	25	36	400	49	5	10	5	18	3	11	54
Montserrat																											
Netherlands Antilles																											
Nicaragua	0									0									0								
Panama	61	43	23	13	7	15		0	66	11	9	27	36	18	9		0	36	52	23	15	13		46	2	0	38
Paraguay	66	52	27	2		8		12	79	2	50	50					0	100	27	41	19	4		11		26	59
Peru	1 520	74	2	3	3	7	1	9	76										266	52	6	5	3	19	0	16	58
Puerto Rico	0									0									0								
Saint Kitts & Nevis																											
Saint Lucia																											
St Vincent & Grenadines																											
Suriname																											
Trinidad & Tobago																											
Turks & Caicos Islands																											
Uruguay	31	77	3	13	0	6	0	0	81	2	100	0	0	0	0	0	0	100	5	40	0	0	0	40	0	20	40
US Virgin Islands																											
USA																											
Venezuela	257	77	0	8	1	11	3	0	77																		
AMR	**5 851**	**50**	**14**	**5**	**3**	**9**	**5**	**14**	**64**	**410**	**20**	**8**	**7**	**18**	**8**	**6**	**33**	**27**	**2 699**	**27**	**14**	**6**	**2**	**26**	**9**	**16**	**41**

Not eval. indicates not evaluated (percentage of registered cases for which outcomes were not recorded); success, sum of cured and completed; cases regist'd, the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2006 is used as the denominator for calculating treatment outcomes unless it is less than the sum of outcomes, in which case the sum of outcomes is used. If the number of cases registered is not reported, then the number of cases notified in 2006 is used, or the sum of outcomes if the latter is greater. Data can be downloaded from www.who.int/tb

Table A3.10 **DOTS treatment success and case detection rates, the Americas, 1994–2007**

	DOTS new smear-positive treatment success (%)													DOTS new smear-positive case detection rate (%)												
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Anguilla																										
Antigua & Barbuda					50	50	100	100	100		100							44	136	46	91	47		284		
Argentina					55	59	54	64	58	66	58	53	63			4	7	20	31	39	72	67	66	67	71	76
Bahamas					72	66		64	59	62			75					67	100		55	49	62			52
Barbados										100		91	100							118	99		396		85	173
Belize						88	78	66	85	89	60	75			98	67			85	100	130	111	60	101	101	89
Bermuda																										
Bolivia	66	62	71	77	62	74	79	82	84	81	80	78	83	39	78	73	77	77	75	78	80	75	75	76	71	71
Brazil					91	89	73	67	75	83	81	77	72				4	4	7	7	9	17	43	51	64	69
British Virgin Islands																										
Canada				40	39	36	35	42	36	45	62	68	57	45	46	52	49	54	61	58	52	43	58	58	55	62
Cayman Islands								100												130			130			129
Chile	83	79	80	77	83	83	82	83	86	85	83	78	85	73	77	82	86	87	79	87	96	92	99	95	130	105
Colombia					74	82	80	85	84	83	85	71	71					30	88		9	8	18	26	85	81
Costa Rica						81	76	72	85	94		89	88					31	120	88	76	118	150	120	105	120
Cuba	86	90	92	90	94	91	93	93	92	93	93	91	90	82	88	88	92	96	97	87	91	93	90	100	100	109
Dominica			100					100					50			94	57				39				160	61
Dominican Republic						81	79	85	78	81	80	85	78					9	6	9	40	63	67	73	69	66
Ecuador								82	84	84	85	83	74							5	31	38	42	28	35	46
El Salvador					77	78	79	88	88	88	90	91	91			46	52	56	56	58	58	53	58	69	61	65
Grenada																										
Guatemala	62	61	81	73	79	81	86	85	84	91	85		47	43	57	56	56	56	50	40	44	42	54	54	55	40
Guyana						91	91	90	85	57	72	67	68						11	21	10	31	27	41	50	39
Haiti				73	79	70	73	75	78	78	80	81	82			2	11	22	19	25	33	37	37	44	45	49
Honduras					93	88	89	86	87	87	85	88	86				2	15	106	125	129	91	86	89	88	87
Jamaica		67	72	79	89	74	45	78	49	53	46	57	41		92	95	90	101	100	83	66	88	75	57	65	83
Mexico			75	65	78	80	76	83	84	83	82	77	80			13	26	36	64	89	72	86	78	93	97	99
Montserrat																						452		405		393
Netherlands Antilles																										
Nicaragua	81	80	79	81	82	81	82	83	82	84	87	85	89	72	81	81	82	80	78	82	75	82	80	78	83	97
Panama				51	51	80	67	65	73	74	78	80	79				12	8	32	70	80	74	106	105	103	98
Paraguay							77	86	92	85	83	83	83						4	9	8	19	20	33	62	58
Peru	81	83	89	90	92	93	90	90	92	89	90	91	78	102	88	94	99	91	88	88	87	82	84	89	97	93
Puerto Rico		68	69	69	72	70	64	76	60	66	71	75	80		58	72	66	76	67	72	88	70	76	71	88	77
Saint Kitts & Nevis					25	50							100				165	82			40				39	155
Saint Lucia				67	82	89	100	50	25	89	64	69	80			113	80	72	56	48	63	63	86	86	101	139
St Vincent & Grenadines				86		100	100	80			86						18		55	18		37	30	37	49	
Suriname																										
Trinidad & Tobago																										
Turks & Caicos Islands					71							67						122							367	
Uruguay	83	68	80	77	84	83	85	85	82	86		84	87	76	94	94	84	88	79	79	72	89	90	87	76	95
US Virgin Islands		50													73											
USA	72	76	79	79	81	82	83	83	83	83	82	64	64	85	84	84	85	86	84	85	85	86	87	86	89	87
Venezuela	68	74	80	72	81	82	76	80	82	82	81	83	82	73	75	75	78	82	78	68	66	81	79	75	72	68
AMR	**76**	**78**	**83**	**82**	**81**	**83**	**81**	**82**	**83**	**83**	**82**	**78**	**75**	**26**	**26**	**29**	**33**	**36**	**43**	**42**	**45**	**49**	**57**	**62**	**72**	**73**

Treatment success, sum of cured and completed; DOTS new smear-positive case detection rate, notified new smear-positive cases divided by estimated incident cases. Figures for all years are updated as new information becomes available and/or techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.11 **New smear-positive case notification by age and sex, DOTS and non-DOTS, the Americas, 2007**

	Male							Female							All							Male/female
	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+	ratio
Anguilla																						
Antigua & Barbuda	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	
Argentina	77	656	623	401	415	389	324	70	558	500	246	217	172	246	147	1 214	1 123	647	632	561	570	1.4
Bahamas	0	3	3	9	4	1	0	0	3	4	3	1	1	0	0	6	7	12	5	2	0	1.7
Barbados	0	0	0	0	5	0	0	0	0	0	0	3	0	0	0	0	0	0	8	0	0	1.7
Belize	1	6	8	8	7	6	3	0	8	2	5	2	2	3	1	14	10	13	9	8	6	1.8
Bermuda																						
Bolivia	116	1 100	604	379	348	328	354	125	736	453	243	193	162	259	241	1 836	1 057	622	541	490	613	1.5
Brazil	371	4 399	5 990	5 456	4 878	2 726	2 075	344	2 952	3 250	2 327	1 727	977	972	715	7 351	9 240	7 783	6 605	3 703	3 047	2.1
British Virgin Islands																						
Canada	5	31	41	51	50	35	75	2	32	33	33	11	13	51	7	63	74	84	61	48	126	1.6
Cayman Islands	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
Chile	3	86	137	140	169	139	121	8	59	75	63	49	39	78	11	145	212	203	218	178	199	2.1
Colombia	144	618	704	694	712	574	786	138	599	620	459	393	286	461	282	1 217	1 324	1 153	1 105	860	1 247	1.4
Costa Rica	4	44	57	28	32	17	31	3	16	24	19	16	16	15	7	60	81	47	48	33	46	2.0
Cuba																						
Dominica	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	2	0	2.0
Dominican Republic	23	290	403	362	209	108	85	29	249	242	174	103	53	43	52	539	645	536	312	161	128	1.7
Ecuador	42	555	486	367	282	178	227	57	365	335	198	133	100	123	99	920	821	565	415	278	350	1.6
El Salvador	8	79	179	110	73	62	95	4	63	85	50	45	33	56	12	142	264	160	118	95	151	1.8
Grenada						1	1		1							1				1	1	2.0
Guatemala	74	169	207	226	203	159	155	183	163	246	145	153	143	122	257	332	453	371	356	302	277	1.0
Guyana	2	15	43	44	41	12	8	1	20	19	17	5	3	3	3	35	62	61	46	15	11	2.4
Haiti	104	1 166	1 199	760	471	219	192	147	1 261	1 107	632	344	182	131	251	2 427	2 306	1 392	815	401	323	1.1
Honduras	21	204	293	194	158	123	180	29	185	175	110	106	84	112	50	389	468	304	264	207	292	1.5
Jamaica		12	10	7	17	7	3	2	5	2	6	2	2	3	2	17	12	13	19	9	6	2.5
Mexico	145	981	1 286	1 286	1 266	942	1 226	140	645	742	694	748	642	788	285	1 626	2 028	1 980	2 014	1 584	2 014	1.6
Montserrat														1							1	
Netherlands Antilles																						
Nicaragua	16	172	194	144	130	77	91	27	158	168	100	76	45	55	43	330	362	244	206	122	146	1.3
Panama	7	106	139	116	81	50	61	7	56	74	59	33	21	23	14	162	213	175	114	71	84	2.1
Paraguay	14	171	221	152	135	94	100	15	100	98	46	46	34	47	29	271	319	198	181	128	147	2.3
Peru	395	3 436	2 239	1 585	1 152	654	702	335	2 684	1 603	1 127	813	402	669	730	6 120	3 842	2 712	1 965	1 056	1 371	1.3
Puerto Rico	0	6	2	9	8	10	6	0	0	2	4	7	1	1	0	6	4	13	15	11	7	2.7
Saint Kitts & Nevis		1	1	1									1			1	1	1		1		3.0
Saint Lucia			3	3	2	4	3					1		1			3	3	3	4	4	7.5
St Vincent & Grenadines	0	0	1	3	0	1	0	0	0	0	0	0	0	0	0	0	1	3	0	1	0	
Suriname																						
Trinidad & Tobago	1	10	16	21	28	18	5	0	5	7	7	4	3	5	1	15	23	28	32	21	10	3.2
Turks & Caicos Islands																						
Uruguay	1	39	69	37	50	39	39	1	23	26	22	14	7	13	2	62	95	59	64	46	52	2.6
US Virgin Islands																						
USA	12	414	490	572	744	533	562	12	257	338	260	225	135	308	24	671	828	832	969	668	870	2.2
Venezuela	17	324	382	390	389	272	295	40	276	271	199	160	147	230	57	600	653	589	549	419	525	1.6
AMR	**1 603**	**15 093**	**16 030**	**13 556**	**12 060**	**7 781**	**7 805**	**1 719**	**11 479**	**10 501**	**7 248**	**5 630**	**3 707**	**4 819**	**3 322**	**26 572**	**26 531**	**20 804**	**17 690**	**11 488**	**12 624**	**1.6**

For some countries, breakdown of notified cases by age and sex is missing, or is provided for a subset of cases. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.12 **New smear-positive case notification rates by age and sex, DOTS and non-DOTS, the Americas, 2007**

	Male							Female							All						
	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+
Anguilla																					
Antigua & Barbuda																					
Argentina	1	19	20	17	21	25	20	1	17	16	10	10	10	10	1	18	18	13	15	17	14
Bahamas	0	10	12	37	22	9	0	0	10	15	12	5	8	0	0	10	13	24	13	9	0
Barbados	0	0	0	0	22	0	0	0	0	0	0	12	0	0	0	0	0	0	17	0	0
Belize	2	20	34	50	66	99	52	0	28	9	31	19	34	48	1	24	21	40	43	67	50
Bermuda																					
Bolivia	6	116	86	74	98	141	181	7	80	64	46	51	63	106	7	98	75	60	74	100	139
Brazil	1	25	38	42	49	45	39	1	17	20	17	16	14	14	1	21	29	29	32	29	25
Islands																					
Canada	0	1	2	2	2	2	4	0	1	1	1	0	1	2	0	1	2	2	1	1	3
Cayman Islands																					
Chile	0	6	11	11	16	21	20	0	4	6	5	5	6	10	0	5	9	8	10	13	14
Colombia	2	14	19	22	31	42	74	2	14	17	14	16	18	33	2	14	18	18	23	29	51
Costa Rica	1	10	16	9	13	12	25	1	4	7	6	7	11	10	1	7	11	8	10	12	17
Cuba																					
Dominica																					
Republic	1	32	54	59	47	39	31	2	28	32	28	23	19	15	2	30	43	43	35	29	23
Ecuador	2	43	47	45	46	46	59	3	29	33	24	21	25	28	2	36	40	34	33	35	42
El Salvador	1	12	30	29	30	35	57	0	10	14	12	15	17	25	1	11	22	20	22	25	39
Grenada						42	34		9							4				20	14
Guatemala	3	13	24	43	54	57	56	7	12	25	23	36	47	40	5	12	25	32	44	52	48
Guyana	2	26	85	75	87	41	37	1	33	38	35	13	14	13	1	30	62	57	53	29	25
Haiti	6	112	172	162	140	105	104	8	122	150	126	95	77	59	7	117	161	143	116	90	79
Honduras	1	27	57	58	67	87	130	2	24	32	30	43	57	70	2	26	44	43	55	71	98
Jamaica		5	5	4	14	9	3	0	2	1	3	1	3	3	0	3	3	4	7	6	3
Mexico	1	11	15	18	25	29	42	1	6	8	9	14	19	22	1	8	11	14	19	24	31
Montserrat																					
Antilles																					
Nicaragua	2	28	46	50	65	65	83	3	26	37	33	36	39	45	2	27	41	41	50	52	63
Panama	1	35	52	49	49	46	61	1	19	28	25	20	19	21	1	27	40	37	35	33	40
Paraguay	1	27	48	45	51	56	71	1	16	22	14	18	21	29	1	21	35	30	35	39	49
Peru	9	125	98	91	91	80	96	8	100	71	63	63	48	76	9	112	84	77	77	64	85
Puerto Rico	0	2	1	4	4	5	3	0	0	1	1	3	0	0	0	1	1	2	3	3	1
Saint Kitts & Nevis																					
Saint Lucia			23	28	25	81	58					12		15			11	13	18	40	34
Grenadines	0	0	10	37	0	32	0	0	0	0	0	0	0	0	0	0	5	19	0	15	0
Suriname																					
Trinidad & Tobago	1	7	14	22	36	38	13	0	4	6	7	5	6	10	0	5	10	14	19	21	11
Islands																					
Uruguay	0	15	29	18	27	27	22	0	9	11	10	7	4	5	0	12	20	14	16	15	11
US Virgin Islands																					
USA	0	2	2	3	3	3	4	0	1	2	1	1	1	1	0	2	2	2	2	2	2
Venezuela	0	12	17	22	29	31	45	1	11	12	11	12	17	30	1	11	15	16	20	24	36
AMR	**1**	**20**	**23**	**22**	**23**	**22**	**23**	**1**	**15**	**15**	**12**	**10**	**10**	**11**	**1**	**17**	**19**	**17**	**16**	**16**	**16**

Rates are per 100 000 population of each age/sex group. Rates are calculated excluding those countries for which breakdown of notified cases or population by age and sex is missing. Data can be downloaded from www.who.int/tb

Table A3.13 **TB case notifications, the Americas, 1980–2007**

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Anguilla	0	0	4	0	0	1	0	0	0	0	0	0	0			2		0				0	0	0	0		0	0
Antigua & Barbuda	8	3	0	1	3	2	7	0	3	3	1	0	6			0	3	4	4	3	4	1	4	1		6	4	2
Argentina	16 406	16 693	17 292	17 305	16 359	15 987	14 681	13 368	13 267	12 636	12 309	12 185	12 606	13 887	13 683	13 450	13 397	12 621	12 276	11 871	11 767	11 456	11 548	10 728	10 619	9 770	9 406	9 755
Bahamas	70	67	54	58	53	63	52	43	51	52	46	53	63	60	78	57	59	88	75	76	82		44	38	53			46
Barbados	64	3	30	17	14	12	7	3	4	5	5	5	6			3	3	5	7	2	3	6	5		19		5	16
Belize	21	33	44	140	35	25	23	41	28	30	57	89	65	80	59	95	99	107	123	104	106	136	135	99	83	102	85	63
Bermuda	1	2	5	10	3	3	6	2	1	2	0	3	4			4	0	4	0	0	0	0	0		6		3	
Bolivia	4 412	5 072	4 777	5 178	4 131	7 679	6 837	8 960	10 664	12 563	11 166	11 223	9 520	8 614	9 431	14 422	10 194	9 853	10 132	9 863	10 127	10 531	10 201	9 836	9 801	9 748	9 014	8 574
Brazil	72 608	86 411	87 822	86 617	88 365	84 310	83 731	81 826	82 395	80 048	74 570	84 990	85 955		75 759	91 013	87 254	83 309	95 009	78 870	77 899	74 466	81 436	80 114	86 881	80 209	77 632	74 757
British Virgin Islands																		3			1	1	1	1	2	0		0
Canada	2 762	2 526	2 473	2 355	2 356	2 144	2 145	1 972	1 947	2 035	1 968	2 012	2 107	2 011	2 066	1 921	1 849	1 969	1 773	1 791	1 667	1 657	1 602	1 574	1 533	1 484	1 434	1 476
Cayman Islands	0	2	0	1	1	4	1	0	0	2	2	3	3	2		2	0	0	3	2	5	1	0	0	1		0	1
Chile	8 523	7 337	6 941	6 989	6 561	6 644	6 854	6 280	6 324	6 728	6 151	5 498	5 304	4 598	4 138	4 150	4 178	3 880	3 652	3 429	3 021	3 006	2 448	2 226	2 664	2 134	2 486	2 418
Colombia	11 589	11 483	12 126	13 716	12 792	12 024	11 639	11 437	11 469	11 329	12 447	12 263	11 199	11 043	8 901	9 912	9 702	8 042	9 155	10 999	11 630	11 480	11 376	11 640	11 242	10 360	11 128	10 950
Costa Rica	396	521	459	479	393	376	418	434	442	311	230	201	118	313	325	586	636	692	730	851	585	630	543	527	712	534	488	550
Cuba	1 133	833	815	762	705	680	656	630	628	581	546	514	410	790	1 681	1 553	1 465	1 346	1 234	1 135	1 183	926	898	840	784	770	765	762
Dominica	20	26	18	16	5	8	35	27	7	13	6	14	13	7	12	8	10	6	5				2				19	3
Dominican Republic	2 174	1 778	2 457	2 959	3 100	2 335	2 634	2 459	3 081	3 145	2 597	1 837	3 490	4 033	4 337	4 053	6 302	5 381	5 114	5 767	5 291	4 766	4 040	4 696	4 549	5 003	4 561	4 150
Ecuador	3 950	3 966	3 880	3 985	4 301	4 798	5 687	5 867	5 497	5 480	8 243	6 879	7 313	7 050	9 685	7 893	8 397	9 435	7 164	5 756	6 908	6 015	5 829	6 442	6 122	4 416	4 594	4 877
El Salvador	2 255	2 091	2 171	2 053	1 564	1 461	1 659	1 647	2 378	617	2 367	2 304	2 495	3 347	3 901	2 422	1 686	1 662	1 700	1 623	1 485	1 458	1 550	1 383	1 406	1 794	1 644	1 666
Grenada	17	1	1	6	4	2	1	2	0	4	0	1	3	0	3	4	0	2	2	5	0		1	2	2		1	3
Guatemala	5 624	6 641	7 277	6 013	6 586	6 570	4 806	5 700	5 739	4 900	3 813	2 631	2 517	2 474	2 508	3 119	3 232	2 948	2 755	2 820	2 913	2 419	2 909	2 642	3 313	3 365	3 626	3 140
Guyana	124	117	135	149	165	215	190	117	150	120	168	134	182	91	266	296	314	407	318	407	422	422	590	631	603	639	710	594
Haiti	8 306	6 550	3 337	6 839	5 803	4 959	8 583	8 514	8 054	8 100		10 237				6 212	6 632	10 116	9 770	9 124	10 420	10 224	12 066	14 004	14 533	14 311	13 959	14 133
Honduras	1 674	1 696	1 714	1 935	2 120	3 377	4 213	4 227	3 962	4 026	3 647	4 560	4 155	3 745	4 291	4 984	4 176	4 030	4 916	4 568	6 406	5 048	4 485	3 858	3 594	3 333	3 197	2 772
Jamaica	176	178	153	157	160	130	88	133	65	86	123	121	111	115	109	109	121	118	121	115	127	121	106	120	116	90	95	104
Mexico	31 247	32 572	24 853	22 795	14 531	15 017	13 180	14 631	15 371	15 489	14 437	15 216	14 446	15 145	16 353	11 329	20 722	23 575	21 514	19 802	18 434	18 879	17 790	17 078	15 101	18 524	17 887	18 324
Montserrat	1	0	0	1	7	9	5	13	6	5	1	1	0		0				1	2	0	0	0	1	0	1	0	2
Netherlands Antilles																	5	14	7	4	5	9	15	9	11		5	
Nicaragua	1 300	3 723	3 082	2 773	2 705	2 604	2 617	2 983	2 737	3 106	2 944	2 797	2 885	2 798	2 750	2 842	3 003	2 806	2 604	2 558	2 402	2 447	2 092	2 283	2 220	1 907	1 997	2 303
Panama	643	580	580	429	413	614	709	765	770	672	846	863	750	1 146	827	1 300	1 314	1 473	1 422	1 387	1 169	1 711	1 575	1 620	1 701	1 637	1 636	1 596
Paraguay	1 354	1 388	1 415	1 800	1 718	1 931	1 628	1 502	1 438	2 270	2 167	2 283	1 927	2 037	1 850	1 745	2 072	1 946	1 831	2 115	1 950	2 073	2 107	2 175	2 298	2 075	2 447	2 269
Peru	16 011	21 925	21 579	22 753	22 792	24 438	24 702	30 571	36 908	35 687	37 905	40 580	52 552	51 675	48 601	45 310	41 739	42 062	43 723	40 345	38 661	37 197	36 092	31 273	33 082	33 421	34 311	32 407
Puerto Rico	686	521	473	452	418	338	363	303	275	314	159	241		256	274	262	222	257	201	200	174	121	129	115	123	113	112	98
Saint Kitts & Nevis	7	4	6	2	3	0	0	0	0	0	0	1	4	6	2	5	3	12	5	3	0	2	3	1	2	0	1	4
Saint Lucia	41	39	37	48	55	21	34	25	32	28	13	25	26		24	11	35	22	20	16	9	15	17	14	15	14	15	19
St Vincent & Grenadines	78	11	14	4	23	14	9	3	6	3	2	1	4	13	0	13	6	6	8	9	16	10	10	14	8	7	13	12
Suriname	78	81	56	78	76	50	60	77	77	70	82	47	58	45	53		53	76	85	95	89	75	97	95	97	117	127	
Trinidad & Tobago	80	82	62	112	108	112	119	122	108	124	120	141	142	112	129	166	204	260	199	159	198	206	133	147	178	166	232	218
Turks & Caicos Islands	2	0	2	5	0	4	2	12			0	0	0	0						17		3	3	6			7	
Uruguay	1 874	1 699	1 450	1 359	1 389	1 201	1 082	1 023	951	987	886	759	699	689	666	625	701	708	668	627	645	689	536	643	727	622	557	607
US Virgin Islands	0	1	1	2	3	1	1	2	6	4	4	4			10	4	8											
USA	27 749	27 373	25 520	23 846	22 255	22 201	22 768	22 517	22 436	23 495	25 701	26 283	26 673	25 107	24 205	22 728	21 210	19 751	18 287	17 501	16 310	15 945	15 056	14 838	14 502	14 080	13 779	13 299
Venezuela	4 233	4 093	4 159	4 266	4 737	4 822	4 974	4 954	4 557	4 524	5 457	5 216	5 444	5 169	4 877	5 578	5 650	5 984	6 273	6 598	6 466	6 251	6 204	6 734	6 808	6 847	6 705	6 456
AMR	**227 697**	**248 122**	**237 274**	**238 465**	**226 812**	**227 186**	**227 206**	**233 192**	**241 834**	**239 594**	**231 186**	**252 215**	**253 255**	**166 458**	**241 854**	**258 188**	**256 656**	**254 980**	**262 886**	**240 619**	**238 580**	**230 403**	**233 678**	**228 448**	**235 511**	**227 599**	**224 687**	**218 426**
Number reporting	42	42	42	42	42	42	42	42	41	41	41	42	39	33	35	39	40	41	40	40	40	40	43	40	40	34	41	39
% reporting	95	95	95	95	95	95	95	95	93	93	93	95	89	75	80	89	91	93	91	91	91	91	98	91	91	77	93	89

From 1995 on, number shown is all notified new and relapse cases (DOTS and non-DOTS). Figures for all years are updated as new information becomes available, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.14 **TB case notification rates, the Americas, 1980–2007**

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Anguilla	0	0	57	0	0	14	0	0	0	0	0	0	0			19		0				0	0	0	0		0	0
Antigua & Barbuda	11	4	0	1	4	3	11	0	5	5	2	0	10			0	4	6	5	4	5	1	5	1		7	5	2
Argentina	58	59	60	59	55	53	48	43	42	39	38	37	38	41	40	39	38	35	34	33	32	31	31	28	28	25	24	25
Bahamas	33	31	25	26	23	27	22	18	21	21	18	20	24	22	28	20	21	30	25	25	27		14	12	17			14
Barbados	26	1	12	7	5	5	3	1	1	2	2	2	2			1	1	2	2	1	1	2	2		7		2	5
Belize	15	22	29	91	22	15	14	24	16	17	31	47	33	40	28	44	45	47	53	44	43	54	53	38	31	37	30	22
Bermuda	2	4	9	18	5	5	10	3	2	3	0	5	7			7	0	6	0	0	0	0	0		9		5	
Bolivia	82	93	85	91	71	129	112	144	167	193	167	164	136	120	129	193	133	126	127	121	122	124	118	111	109	106	96	90
Brazil	60	69	69	66	66	62	60	58	57	54	50	56	56		48	56	53	50	56	46	45	42	45	44	47	43	41	39
British Virgin Islands																		16			5	5	5	5	9	0		0
Canada	11	10	10	9	9	8	8	7	7	7	7	7	7	7	7	7	6	7	6	6	5	5	5	5	5	5	4	4
Cayman Islands	0	11	0	5	5	19	5	0	0	8	8	11	10	7		6	0	0	8	5	12	2	0	0	2		0	2
Chile	76	65	60	60	55	55	56	50	50	52	47	41	39	33	29	29	29	26	24	23	20	19	16	14	17	13	15	15
Colombia	41	40	41	45	41	38	36	35	34	33	36	34	31	30	24	26	25	20	23	27	28	27	26	27	25	23	24	24
Costa Rica	17	22	18	19	15	14	15	15	15	10	7	6	4	9	10	17	18	19	19	22	15	16	13	13	17	12	11	12
Cuba	12	8	8	8	7	7	6	6	6	6	5	5	4	7	15	14	13	12	11	10	11	8	8	7	7	7	7	7
Dominica	27	35	25	22	7	11	49	38	10	19	9	20	19	10	17	12	15	9	7				3				28	4
Dominican Republic	37	29	40	47	48	35	39	36	44	44	36	25	46	52	55	51	77	65	61	67	61	54	45	51	49	53	47	43
Ecuador	50	48	46	46	49	53	61	61	56	55	80	65	68	64	87	69	72	80	60	47	56	48	46	50	47	34	35	37
El Salvador	49	45	46	44	33	31	34	34	48	12	46	44	47	62	71	43	29	28	28	27	24	23	24	21	21	27	24	24
Grenada	19	1	1	6	4	2	1	2	0	4	0	1	3	0	3	4	0	2	2	5	0		1	2	2		1	3
Guatemala	80	92	99	80	85	83	59	69	67	56	43	29	27	26	26	31	32	28	26	26	26	21	25	22	27	26	28	24
Guyana	16	15	18	20	22	29	25	16	20	16	23	18	25	12	36	40	42	55	43	55	57	57	80	86	82	86	96	80
Haiti	146	113	56	112	93	78	131	128	118	116		141				79	83	124	118	108	122	117	136	156	159	154	148	147
Honduras	46	45	44	49	52	80	97	94	86	85	75	91	80	71	79	89	73	69	83	75	103	80	70	59	54	49	46	39
Jamaica	8	8	7	7	7	6	4	6	3	4	5	5	5	5	4	4	5	5	5	4	5	5	4	5	4	3	4	4
Mexico	45	46	34	31	19	20	17	18	19	19	17	18	17	17	18	12	22	25	22	20	18	19	17	17	15	18	17	17
Montserrat	8	0	0	9	61	80	45	118	55	46	9	9	0		0				15	35	0	0	0	20	0	18	0	34
Netherlands Antilles																	3	8	4	2	3	5	8	5	6		3	
Nicaragua	40	111	90	78	75	70	69	77	69	77	71	66	66	63	60	61	63	58	53	51	47	47	40	43	41	35	36	41
Panama	33	29	28	21	19	28	32	34	33	28	35	35	30	45	32	49	48	53	50	48	40	57	51	52	54	51	50	48
Paraguay	42	42	42	52	48	52	43	38	36	55	51	52	43	44	39	36	42	39	36	40	36	38	38	38	40	35	41	37
Peru	92	123	119	122	119	125	124	150	177	167	174	183	232	224	207	190	172	171	175	159	151	143	137	117	123	123	124	116
Puerto Rico	21	16	14	14	12	10	11	9	8	9	5	7		7	7	7	6	7	5	5	5	3	3	3	3	3	3	2
Saint Kitts & Nevis	16	9	14	5	7	0	0	0	0	0	0	2	10	14	5	12	7	27	11	7	0	4	6	2	4	0	2	8
Saint Lucia	35	33	30	39	44	17	26	19	24	21	9	18	18		17	8	24	15	13	11	6	10	11	9	9	9	9	12
St Vincent & Grenadines	78	11	14	4	22	13	9	3	6	3	2	1	4	12	0	12	5	5	7	8	14	9	9	12	7	6	11	10
Suriname	22	23	15	21	20	13	15	20	19	18	20	12	14	11	13		13	18	20	22	20	17	22	21	22	26	28	
Trinidad & Tobago	7	7	6	10	9	10	10	10	9	10	10	11	11	9	10	13	16	20	15	12	15	16	10	11	13	13	17	16
Turks & Caicos Islands	27	0	24	58	0	42	20	117			0	0	0	0						95		15	14	27			28	
Uruguay	64	58	49	46	46	40	36	34	31	32	29	24	22	22	21	19	22	22	20	19	19	21	16	19	22	19	17	18
US Virgin Islands	0	1	1	2	3	1	1	2	6	4	4	4			9	4	7											
USA	12	12	11	10	9	9	9	9	9	9	10	10	10	9	9	8	8	7	7	6	6	6	5	5	5	5	5	4
Venezuela	28	26	26	26	28	28	28	27	24	24	28	26	26	24	23	25	25	26	27	28	26	25	24	26	26	26	25	23
AMR	**37**	**39**	**37**	**37**	**34**	**34**	**33**	**34**	**34**	**33**	**32**	**34**	**34**	**22**	**31**	**33**	**32**	**32**	**32**	**29**	**28**	**27**	**27**	**26**	**27**	**26**	**25**	**24**

Rates are per 100 000 population. From 1995 on, number shown is notification rate of new and relapse cases. Figures for all years are updated as new information becomes available and/or techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.15 **New smear-positive cases notified, the Americas, 1990–2007**

	Number of cases																	
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Anguilla						0		0				0	0		0		0	0
Antigua & Barbuda							2			1	3	1	2	1		6	4	2
Argentina				5 937	5 696	5 698	5 787	5 307	5 186	4 830	4 749	5 595	5 498	4 961	4 760	4 709	4 834	4 985
Bahamas				41	41	38	25	57	30	37	56		32	29	37			32
Barbados						3	3	5	4	2	3	6	5		19		4	8
Belize				50	36	36	46	32	52	48	44	53	71	62	34	59	60	54
Bermuda						2	0		0	0	0	0	0		0		2	
Bolivia				6 833	6 905	7 010	6 949	6 458	6 750	6 673	6 458	6 672	6 829	6 344	6 213	6 278	5 788	5 686
Brazil					39 167	45 650	44 503	43 490	43 554	41 619	41 186	38 478	41 371	39 938	42 881	42 093	41 117	38 444
British Virgin Islands								0			1	0	1	0	2	0		0
Canada	549	543	506	488	483	436	430	473	438	455	492	458	408	332	438	433	407	463
Cayman Islands				2		0	0	0	2	2	5	1	0	0	1		0	1
Chile				2 629	1 951	1 561	1 562	1 582	1 576	1 497	1 290	1 355	1 412	1 276	1 297	1 186	1 533	1 166
Colombia				6 987	6 532	7 530	7 572	6 090	6 969	8 329	8 358	8 022	7 787	7 972	7 640	6 870	7 648	7 188
Costa Rica					230	245	302	320	353	458	349	385	328	346	419	330	285	322
Cuba				565	914	834	835	765	746	720	675	559	540	507	453	467	432	432
Dominica				6	8	5	7	5	5				2				8	3
Dominican Republic				2 297	3 177	2 787	3 733	3 162	2 669	3 278	2 907	2 622	2 179	2 806	2 720	2 949	2 658	2 373
Ecuador				5 325	6 674	5 890	6 426	7 214	4 900	4 300	5 064	4 439	4 223	4 488	4 340	3 048	3 182	3 448
El Salvador				2 471	2 144		965	882	1 071	1 023	1 008	1 003	980	870	926	1 059	913	942
Grenada				0	3	2	0	1	2	3	0		0	2	2		1	3
Guatemala				2 128	1 994	2 368	2 224	2 218	2 255	2 264	2 052	1 669	1 865	1 795	2 339	2 420	2 501	2 348
Guyana				51	61	85	71	105	85	178	119	174	138	244	164	240	294	233
Haiti							3 524	5 497	6 442	6 828	5 887	5 607	6 188	7 015	7 044	7 340	7 461	7 915
Honduras				2 016	2 385	2 306	1 808	1 928	2 311	2 415	3 404	3 141	3 080	2 139	2 011	2 069	2 018	1 974
Jamaica				83	61	93	81	84	90	90	90	75	60	81	69	53	61	78
Mexico				8 164	9 726	9 220	8 495	15 440	11 473	11 968	11 676	15 103	11 555	12 933	11 214	11 997	11 874	11 531
Montserrat					0				1	2	0	0	0	1	0	1	0	1
Netherlands Antilles							3	5	6	2	2	7	9	4	8		5	
Nicaragua				1 714	1 615	1 568	1 722	1 670	1 648	1 564	1 471	1 510	1 320	1 404	1 327	1 253	1 285	1 453
Panama				1 046	748	1 066	904	592	1 393	432	460	671	773	778	884	860	858	833
Paraguay	993	943	862	985	873	748	894	859	850	1 041	900	915	1 004	1 166	1 199	1 260	1 452	1 276
Peru				35 646	33 925	32 096	26 800	27 498	27 707	24 511	22 580	21 685	20 533	18 504	18 289	18 490	19 251	17 796
Puerto Rico				122	139	128	110	126	106	106	81	74	78	62	65	60	69	56
Saint Kitts & Nevis				2	2	4	2		4	2	0	0	1		0	0	1	4
Saint Lucia					17	11	22	14	10	9	7	6	8	8	11	11	13	18
St Vincent & Grenadines				11	0	5	3	2	3	4	9	3	0	6	5	6	8	4
Suriname							39	31	32	36	37	36	42	35	37	49	63	
Trinidad & Tobago					55	7	58	52	82	87	115	152	60	77	71	95	149	130
Turks & Caicos Islands										2		1	2	6			7	
Uruguay				388	381	349	426	423	374	392	348	340	308	373	373	355	305	380
US Virgin Islands						2	5											
USA				9 429	8 964	8 093	7 454	6 935	6 624	6 275	5 883	5 650	5 439	5 368	5 277	5 111	5 091	4 864
Venezuela				2 849	2 738	3 056	3 195	3 234	3 450	3 670	3 525	3 476	3 444	3 882	3 776	3 653	3 547	3 392
AMR	**1 542**	**1 486**	**1 368**	**98 265**	**137 645**	**138 932**	**136 987**	**142 556**	**139 253**	**135 153**	**131 294**	**129 944**	**127 575**	**125 815**	**126 345**	**124 810**	**125 189**	**119 838**

	Rate (per 100 000 population)																	
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Anguilla						0		0				0	0		0		0	0
Antigua & Barbuda							3			1	4	1	3	1		7	5	2
Argentina				17	17	16	16	15	14	13	13	15	15	13	12	12	12	13
Bahamas				15	15	14	9	20	10	12	18		10	9	12			10
Barbados						1	1	2	1	1	1	2	2		7		1	3
Belize				25	17	17	21	14	22	20	18	21	28	24	13	21	21	19
Bermuda						3	0		0	0	0	0	0		0		3	
Bolivia				96	94	94	91	83	85	82	78	79	79	72	69	68	62	60
Brazil					25	28	27	26	26	24	24	22	23	22	23	23	22	20
British Virgin Islands								0			5	0	5	0	9	0		0
Canada	2	2	2	2	2	1	1	2	1	1	2	1	1	1	1	1	1	1
Cayman Islands				7		0	0	0	5	5	12	2	0	0	2		0	2
Chile				19	14	11	11	11	10	10	8	9	9	8	8	7	9	7
Colombia				19	17	20	19	15	17	20	20	19	18	18	17	15	17	16
Costa Rica					7	7	8	9	9	12	9	10	8	8	10	8	6	7
Cuba				5	8	8	8	7	7	6	6	5	5	5	4	4	4	4
Dominica				9	12	7	10	7	7				3				12	4
Dominican Republic				30	40	35	46	38	32	38	33	29	24	31	29	31	28	24
Ecuador				49	60	52	55	61	41	35	41	36	33	35	34	23	24	26
El Salvador				46	39		17	15	18	17	16	16	15	13	14	16	14	14
Grenada				0	3	2	0	1	2	3	0		0	2	2		1	3
Guatemala				22	20	24	22	21	21	21	18	15	16	15	19	19	19	18
Guyana				7	8	12	10	14	12	24	16	24	19	33	22	32	40	32
Haiti							44	68	78	81	69	64	70	78	77	79	79	82
Honduras				38	44	41	32	33	39	40	55	50	48	33	30	30	29	28
Jamaica				3	2	4	3	3	4	4	3	3	2	3	3	2	2	3
Mexico				9	11	10	9	16	12	12	12	15	11	13	11	12	11	11
Montserrat					0				15	35	0	0	0	20	0	18	0	17
Netherlands Antilles							2	3	3	1	1	4	5	2	4		3	
Nicaragua				38	35	34	36	34	33	31	29	29	25	26	25	23	23	26
Panama				41	29	40	33	21	49	15	16	22	25	25	28	27	26	25
Paraguay	23	22	19	22	19	16	18	17	17	20	17	17	18	21	21	21	24	21
Peru				155	145	135	111	112	111	97	88	83	78	69	68	68	70	64
Puerto Rico				3	4	3	3	3	3	3	2	2	2	2	2	2	2	1
Saint Kitts & Nevis				5	5	9	5		9	4	0	0	2		0	0	2	8
Saint Lucia					12	8	15	9	7	6	5	4	5	5	7	7	8	11
St Vincent & Grenadines				10	0	4	3	2	3	3	8	3	0	5	4	5	7	3
Suriname							9	7	7	8	8	8	9	8	8	11	14	
Trinidad & Tobago					4	1	5	4	6	7	9	12	5	6	5	7	11	10
Turks & Caicos Islands										11		5	9	27			28	
Uruguay				12	12	11	13	13	11	12	10	10	9	11	11	11	9	11
US Virgin Islands						2	5											
USA				4	3	3	3	3	2	2	2	2	2	2	2	2	2	2
Venezuela				13	13	14	14	14	15	15	14	14	14	15	14	14	13	12
AMR	**< 1**	**< 1**	**< 1**	**13**	**18**	**18**	**17**	**18**	**17**	**16**	**16**	**15**	**15**	**14**	**14**	**14**	**14**	**13**

Rates are per 100 000 population. Figures for all years are updated as new information becomes available and/or techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.16 **NTP budgets, available funding, cost of utilization of general health-care services and total TB control costs (US$ millions), the Americas, 2009**

	NTP budget	Available funding: Government (excluding loans)	Available funding: Loans	Available funding: Grants (excluding Global Fund)	Available funding: Global Fund	Funding gap	Cost of utilization of general health-care services	Total TB control costs	Completeness of budget data
Anguilla									N
Antigua & Barbuda	0.03	0.02	0	0	0.01	0		0.03	C
Argentina	4.0	2.3	1.7	0	0	0		4.0	C
Bahamas	0	0	0	0	0	0		0	N
Barbados									N
Belize									N
Bermuda									N
Bolivia	0	0.9	0	0	1.0	< 0.01		0	P
Brazil	64	50	0.6	1.5	0	11	28	92	C
British Virgin Islands									N
Canada	63	63	0	0	0	0		63	C
Cayman Islands									P
Chile									N
Colombia	5.6	4.8	0	0	0	0.7	1.7	7.2	C
Costa Rica									N
Cuba									N
Dominica									N
Dominican Republic	12	1.2	0	< 0.01	2.3	5.4	1.3	14	C
Ecuador	20	7.6	0	0	2.0	10	0.9	21	C
El Salvador	8.3	3.9	0	0	0	4.4	0.7	9.0	C
Grenada									N
Guatemala	6.2	0.7	0	0.1	1.6	3.8	2.8	9.0	C
Guyana	0	0	0	0	1.8	< 0.01		0	P
Haiti	11	0.6	0	0	10	0	0.9	12	C
Honduras	2.9	1.2	0	0.01	0	1.7	0.7	3.6	C
Jamaica	0.02	0	0	0	0	0.02	0.7	0.7	P
Mexico	4.1	4.1	0	0	0	0	24	28	C
Montserrat									N
Netherlands Antilles									N
Nicaragua	0.3	0.2	0	0	0.1	0	1.3	1.5	C
Panama									N
Paraguay	2.4	0.7	0	0	1.7	< 0.01	1.2	3.6	C
Peru	57	29	0	18	0.1	10	4.8	62	C
Puerto Rico	2.1	1.2	0	0.9	0	< 0.01		2.1	C
Saint Kitts & Nevis									N
Saint Lucia									N
St Vincent & Grenadines									N
Suriname									N
Trinidad & Tobago	7.9	7.9	0	0	0	0	0.9	8.8	C
Turks & Caicos Islands									N
Uruguay									N
US Virgin Islands									N
USA	146	0	0	0	0	0		146	P
Venezuela									N
AMR	**417**	**180**	**2.3**	**21**	**21**	**44**	**70**	**487**	**39%**

N indicates data not available or not applicable; P indicates partial financial data; C indicates complete data and therefore included in analysis presented in chapter 3. Completeness of budget data in total row indicates percentage of countries providing complete financial data. Data can be downloaded from www.who.int/tb

Notes

Cuba

TABLE A3.11: breakdown of notified cases differs from WHO convention. In 2007, breakdown of the 432 notified new smear-positive cases is as follows: 0–14 years, no cases; 15–24 years, 38 cases; 25–59 years, 282 cases; 60–64 years, 21 cases; 65 years+, 91 cases.

USA

In addition to the 51 reporting areas, the United States includes 8 territories (American Samoa, Federated States of Micronesia, Guam, Marshall Islands, Northern Mariana Islands, Puerto Rico, Republic of Palau, US Virgin Islands) that report separately to WHO. The data for these 8 territories are not included with the data for the USA.

Definitions of case types and outcomes do not exactly match those used by WHO.

One state reporting area (representing approximately 20% of TB cases in 2007 and 12% of the population of the USA) did not provide data on HIV testing.

EASTERN MEDITERRANEAN

Eastern Mediterranean

NTP MANAGER (OR EQUIVALENT) AND/OR PERSON(S) RESPONSIBLE FOR COMPLETING DATA COLLECTION FORM

Afghanistan	Khaled Seddiq; Shah Wali Maroofi; Sayed Daoud Mahmoodi; Homayoon Manochehr
Bahrain	Saeed Alsaffar
Djibouti	Said Guelleh
Egypt	Essam El-Moghazy; Amal Galal
Iran (Islamic Republic of)	Mahshid Nasehi; Shahnaz Ahmadi
Iraq	Dhafer S. Hashim; Mohemmed R. Tbena
Jordan	Khaled Abu Rumman; Nadia Abu Sabra
Kuwait	Rashed Al-Owaish; Mohamed Gaafar
Lebanon	Mtanios Saade
Libyan Arab Jamahiriya	Bashir Saafi
Morocco	Naima Ben Cheikh; lahsen laasri
Oman	Hassan Al-Tuhami
Pakistan	Noor Ahmad Baloch; Ejaz Qadeer
Qatar	Abdul Latif Al-Khal
Saudi Arabia	Nailah A. Abulgadayl; Mohammad Salama Abouzeid
Somalia	Bashir Suleiman
Sudan	Hashim Sulieman Elwagea; Joseph Lasu; Samia Ali Alagab; Khadiga Adam; Sindani Ireneaus Sebit
Syrian Arab Republic	Fadia Maamari
Tunisia	Dhikrayet Gamara; Salah Ben Mansour
United Arab Emirates	Juma Bilol Fairouz; Kifah Ibrahim
West Bank and Gaza Strip	Walid Daoud
Yemen	Amin N. Al-Absi

This list shows the people named on the data collection form sent to WHO in 2008, not necessarily the current NTP manager. It is intended as an acknowledgement rather than a directory.

Table A3.1 **Methods and assumptions for estimation of TB incidence, prevalence and mortality, Eastern Mediterranean**

	Reference year	Incidence est. based on	Trend	Source of estimates			Cfr ss+ HIV-		Duration ss+HIV-		Duration ss-HIV-	
				TB/HIV	MDR (new)	MDR (re-treat)	DOTS	non-DOTS	DOTS	non-DOTS	DOTS	non-DOTS
Afghanistan	2005	Notif.	Not estimated	Indirect	Model	Model	0.1	0.3	1	2.5	1	2.5
Bahrain	1997	Notif.	Group, moving ave.	Routine	Model	Model	0.1	0.1	1	1.5	1	1.5
Djibouti	1997	Notif.	Group, exp.	Indirect	Model	Model	0.1	0.2	1	2.5	1	2.5
Egypt	2007	Notif./C-ReC.	Group, moving ave.	Survey	DRS	DRS	0.1	0.1	1	1.5	1	1.5
Iran (Islamic Republic of)	2002	Notif.	Country notifs, moving ave.	Indirect	DRS	DRS	0.1	0.1	1	1.5	1	1.5
Iraq	2002	ARI	Not estimated	–	Model	Model	0.1	0.2	1	1.5	1	1.5
Jordan	2002	Notif.	Country notifs, moving ave.	Routine	DRS	DRS	0.1	0.1	1	1.5	1	1.5
Kuwait	1997	Notif.	Group, moving ave.	Routine	Model	Model	0.1	0.1	1	2	1	2
Lebanon	2002	Notif.	Country notifs, moving ave.	Indirect	DRS	DRS	0.1	0.1	1	1.5	1	1.5
Libyan Arab Jamahiriya	1997	ARI	Group, moving ave.	–	Model	Model	0.1	0.2	1	1.5	1	1.5
Morocco	1997	Notif.	Country notifs, exp.	Sentinel	DRS	DRS	0.1	0.1	0.75	1.5	0.75	1.5
Oman	1997	ARI	Country notifs, moving ave.	Routine	DRS	DRS	0.1	0.1	1	1.5	1	1.5
Pakistan	1997	Prev.	Not estimated	Indirect	Model	Model	0.1	0.3	1	2.5	1	2.5
Qatar	2002	Notif.	Country notifs, moving ave.	Routine	–	–	0.1	0.1	1	1.5	1	1.5
Saudi Arabia	1997	ARI	Country notifs, moving ave.	–	Model	Model	0.1	0.1	1	1.5	1	1.5
Somalia	2001	ARI	Not estimated	Indirect	Model	Model	0.15	0.3	1	2.5	1	2.5
Sudan	1997	ARI	Group, exp.	Sentinel	Model	Model	0.1	0.3	1	2.5	1	2.5
Syrian Arab Republic	2007	Notif./C-ReC.	Country notifs, exp.	–	Model	Model	0.1	0.1	1	1.5	1	1.5
Tunisia	2001	Notif.	Country notifs, moving ave.	Indirect	Model	Model	0.1	0.1	1	1.5	1	1.5
United Arab Emirates	1997	ARI	Group, moving ave.	–	Model	Model	0.1	0.1	1	1.5	1	1.5
West Bank and Gaza Strip	1997	ARI	Group, moving ave.	Routine	Model	Model	0.1	0.2	1	1.5	1	1.5
Yemen	1997	ARI	Group, moving ave.	–	DRS	DRS	0.1	0.15	1	2	1	2

– indicates no estimate; ARI, annual risk of infection; ave, average; C-ReC., capture re-capture; CDR, case detection rate; DRS, drug resistance survey; exp., exponential; HIV+, HIV-positive; HIV-, HIV-negative; Mort., mortality (vital registration); Notif(s)., notification(s); Prev., disease prevalence survey; ss+, sputum smear-positive; ss-, sputum smear-negative. See Annex 2 (methods) for details. Data can be downloaded from www.who.int/tb

Table A3.2 **Estimated burden of TB, Eastern Mediterranean, 1990 and 2007**

	Incidence, 1990				Prevalence, 1990		TB mortality, 1990		Incidence, 2007								Prevalence, 2007				TB mortality, 2007				HIV prevalence in incident TB cases (%)	MDR, 2007			
	All forms*		Smear-positive*		All forms*		All forms*		All forms*		All forms HIV+		Smear-positive*		Smear-positive HIV+		All forms*		All forms HIV+		All forms*		All forms HIV+			Percentage of		Number among	
	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate		new	re-treat	all cases	smear-positive
Afghanistan	21 301	168	9 586	76	55 257	436	6 274	50	45 676	168	< 1	< 1	20 554	76	< 1	< 1	64 699	238	< 1	< 1	8 169	30	< 1	< 1	< 0.05	3.3	36	2 202	1 371
Bahrain	376	76	169	34	593	120	44	9	305	40	–	–	137	18	–	–	449	60	–	–	35	5	–	–	–	2.0	35	6	3
Djibouti	3 265	582	1 462	261	8 323	1 485	705	126	6 769	813	1 895	227	2 856	343	663	80	9 198	1 104	947	114	1 304	157	543	65	28	3.3	32	411	282
Egypt	20 170	37	8 621	16	26 244	48	2 309	4	15 873	21	295	< 1	6 765	9	103	< 1	20 066	27	148	< 1	1 845	2	66	< 1	1.9	2.2	38	781	579
Iran (Islamic Republic of)	20 308	36	9 138	16	28 133	50	2 357	4	15 447	22	485	< 1	6 902	10	170	< 1	19 526	27	243	< 1	1 844	3	108	< 1	3.1	5.0	48	1 138	715
Iraq	10 371	56	4 667	25	16 326	88	2 218	12	16 241	56	–	–	7 308	25	–	–	22 866	79	–	–	3 190	11	–	–	–	3.0	38	988	719
Jordan	538	17	164	5	619	19	46	1	441	7	–	–	135	2	–	–	534	9	–	–	46	< 1	–	–	–	5.4	40	29	12
Kuwait	954	45	429	20	1 908	89	111	5	674	24	–	–	303	11	–	–	712	25	–	–	68	2	–	–	–	1.8	35	12	6
Lebanon	1 487	50	454	15	1 913	64	157	5	762	19	20	< 1	232	6	5	< 1	942	23	10	< 1	82	2	4	< 1	2.6	1.1	63	14	9
Libyan Arab Jamahiriya	1 306	30	588	13	1 989	46	219	5	1 060	17	–	–	477	8	–	–	1 060	17	–	–	77	1	–	–	–	2.4	35	57	43
Morocco	36 934	149	16 618	67	33 232	134	3 330	13	28 617	92	141	< 1	12 863	41	49	< 1	24 955	80	71	< 1	2 586	8	20	< 1	0.5	0.5	12	136	61
Oman	482	26	217	12	745	40	43	2	332	13	–	–	149	6	–	–	369	14	–	–	30	1	–	–	–	1.3	36	6	4
Pakistan	204 820	181	92 134	82	485 491	430	55 749	49	297 108	181	6 238	4	133 075	81	2 183	1	364 793	223	3 119	2	47 587	29	1 426	< 1	2.1	3.2	35	13 218	7 939
Qatar	282	60	127	27	330	71	28	6	588	70	–	–	264	31	–	–	684	81	–	–	61	7	–	–	–	–	–	–	–
Saudi Arabia	6 957	43	3 131	19	10 975	68	807	5	11 442	46	–	–	5 149	21	–	–	16 004	65	–	–	1 327	5	–	–	–	2.1	35	415	282
Somalia	16 705	249	7 511	112	40 120	597	5 780	86	21 634	249	1 481	17	9 587	110	519	6	30 647	352	741	9	5 483	63	682	8	6.8	1.8	10	484	269
Sudan	45 221	174	20 106	78	106 085	409	15 970	62	93 808	243	9 927	26	41 221	107	3 474	9	154 933	402	4 963	13	27 450	71	4 872	13	11	1.8	10	2 336	1 402
Syrian Arab Republic	7 711	61	2 357	19	11 952	94	725	6	4 698	24	–	–	1 436	7	–	–	5 348	27	–	–	442	2	–	–	–	1.6	11	92	41
Tunisia	2 583	31	1 162	14	4 047	49	273	3	2 682	26	34	< 1	1 204	12	12	< 1	2 930	28	17	< 1	282	3	5	< 1	1.3	2.6	36	87	49
United Arab Emirates	555	30	250	13	876	47	64	3	692	16	–	–	311	7	–	–	1 044	24	–	–	80	2	–	–	–	2.3	37	30	21
West Bank and Gaza Strip	745	35	228	11	1 181	55	119	6	799	20	–	–	244	6	–	–	1 250	31	–	–	125	3	–	–	–	3.0	35	27	10
Yemen	16 384	133	7 373	60	32 651	265	2 182	18	17 121	76	–	–	7 704	34	–	–	29 031	130	–	–	2 188	10	–	–	–	2.9	11	580	303
EMR	**419 455**	**110**	**186 491**	**49**	**868 989**	**227**	**99 510**	**26**	**582 767**	**105**	**20 517**	**4**	**258 877**	**47**	**7 179**	**1**	**772 039**	**139**	**10 258**	**2**	**104 300**	**19**	**7 726**	**1**	**3.5**	**2.8**	**27**	**23 049**	**14 120**

– Indicates no estimate.

* Incidence, prevalence and mortality estimates include patients with HIV. Estimates labelled "HIV+" are estimates of HIV+ TB cases in all people. Estimates for all years are re-calculated as new information becomes available and techniques are refined, so they may differ from those published previously. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.3 **Estimated incidence of TB (all forms) in all people, Eastern Mediterranean, 1990–2007**

	Number of cases																		Rate (per 100 000 population)																	
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Afghanistan	21 301	22 757	24 719	26 926	29 012	30 718	31 941	32 772	33 379	34 023	34 894	36 033	37 378	38 894	40 512	42 180	43 896	45 676	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168
Bahrain	376	367	361	349	345	338	335	332	326	314	307	303	307	301	301	303	304	305	76	72	68	64	61	58	57	55	52	49	47	46	45	43	42	42	41	40
Djibouti	3 265	3 443	3 588	3 714	3 848	4 009	4 206	4 432	4 678	4 928	5 170	5 399	5 620	5 836	6 055	6 283	6 522	6 769	582	594	606	618	630	642	655	668	681	695	708	722	737	751	766	781	797	813
Egypt	20 170	20 240	20 779	20 389	20 498	20 390	20 133	19 226	18 681	18 370	18 203	17 918	17 603	17 201	16 716	16 356	16 122	15 873	37	36	36	35	34	34	33	31	29	28	27	26	26	24	23	22	22	21
Iran (Islamic Republic of)	20 308	21 485	24 034	23 332	24 335	24 684	24 512	22 133	20 902	20 434	20 429	20 086	19 541	18 617	17 318	16 432	15 938	15 447	36	37	41	39	40	40	39	35	32	31	31	30	29	27	25	24	23	22
Iraq	10 371	10 681	11 016	11 372	11 741	12 117	12 501	12 891	13 281	13 663	14 033	14 389	14 733	15 064	15 380	15 682	15 968	16 241	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56
Jordan	538	543	540	566	561	578	560	511	470	433	417	392	394	387	409	429	435	441	17	16	15	14	14	13	13	11	10	9	9	8	8	7	8	8	8	7
Kuwait	954	880	795	699	634	589	579	588	603	607	615	622	642	640	648	658	667	674	45	42	40	37	36	34	33	32	31	29	28	27	26	25	25	24	24	24
Lebanon	1 487	1 510	1 542	1 576	1 635	1 594	1 457	1 257	1 164	1 089	1 018	878	769	697	670	668	715	762	50	49	49	48	48	46	41	35	32	29	27	23	20	18	17	17	18	19
Libyan Arab Jamahiriya	1 306	1 312	1 349	1 325	1 335	1 330	1 315	1 258	1 224	1 206	1 197	1 181	1 162	1 138	1 109	1 087	1 074	1 060	30	29	30	29	28	28	27	25	24	23	22	22	21	20	19	18	18	17
Morocco	36 934	36 556	36 148	35 714	35 259	34 788	34 305	33 811	33 307	32 790	32 262	31 723	31 178	30 635	30 104	29 590	29 095	28 617	149	145	141	137	133	129	125	122	118	115	112	109	106	103	100	97	94	92
Oman	482	445	376	328	296	302	300	304	287	294	296	310	287	287	277	305	318	332	26	23	19	16	14	14	13	13	12	12	12	13	12	12	11	12	12	13
Pakistan	204 820	210 524	215 827	220 928	226 120	231 604	237 467	243 619	249 874	255 958	261 684	266 992	271 973	276 764	281 573	286 555	291 743	297 108	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181
Qatar	282	285	293	320	372	401	383	356	356	390	405	415	415	410	432	463	526	588	60	59	59	64	72	76	71	64	63	66	66	64	60	56	57	58	64	70
Saudi Arabia	6 957	6 407	6 360	6 632	7 297	7 804	8 399	8 906	9 473	9 780	9 879	9 748	9 617	9 604	9 756	10 189	10 808	11 442	43	38	37	38	41	43	45	46	48	48	47	46	44	43	42	43	45	46
Somalia	16 705	16 520	16 207	15 857	15 599	15 526	15 669	15 999	16 469	17 003	17 547	18 087	18 638	19 202	19 783	20 385	21 004	21 634	249	249	249	249	249	249	249	249	249	249	249	249	249	249	249	249	249	249
Sudan	45 221	47 271	49 456	51 769	54 194	56 718	59 348	62 089	64 919	67 808	70 734	73 679	76 656	79 711	82 914	86 319	89 953	93 808	174	178	181	185	189	192	196	200	204	208	212	216	221	225	229	234	239	243
Syrian Arab Republic	7 711	7 513	7 313	7 113	6 911	6 708	6 505	6 303	6 107	5 919	5 742	5 576	5 419	5 268	5 121	4 977	4 836	4 698	61	57	54	51	49	46	43	41	39	37	35	33	31	29	28	26	25	24
Tunisia	2 583	2 485	2 684	2 809	2 899	2 827	2 798	2 730	2 639	2 535	2 430	2 321	2 292	2 311	2 387	2 453	2 566	2 682	31	30	31	32	33	31	31	30	28	27	25	24	23	23	24	24	25	26
United Arab Emirates	555	552	552	545	551	554	568	584	594	592	599	608	634	638	653	668	682	692	30	28	27	25	24	23	22	21	20	19	18	18	18	17	17	16	16	16
West Bank and Gaza Strip	745	762	798	799	820	832	838	815	806	808	815	817	817	813	803	799	800	799	35	34	34	33	33	32	31	29	28	27	26	25	24	23	22	21	21	20
Yemen	16 384	16 884	17 856	18 056	18 655	18 983	19 082	18 483	18 169	18 061	18 095	18 016	17 904	17 700	17 402	17 228	17 183	17 121	133	131	132	127	125	122	119	111	106	102	100	96	93	89	85	82	79	76
EMR	**419 455**	**429 421**	**442 594**	**451 118**	**462 914**	**473 393**	**483 201**	**489 400**	**497 708**	**507 006**	**516 769**	**525 495**	**533 979**	**542 116**	**550 322**	**560 010**	**571 155**	**582 767**	**110**	**109**	**110**	**109**	**109**	**109**	**109**	**108**	**107**	**107**	**107**	**106**	**106**	**106**	**105**	**105**	**105**	**105**

Estimates for all years are re-calculated as new information becomes available and techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.4 **Estimated incidence, prevalence and mortality rates (per 100 000 population), Eastern Mediterranean, 2000–2007**

	Incidence of HIV+ TB cases								Prevalence of TB (all forms)								Mortality (excluding HIV+)								Mortality HIV+							
	2000	2001	2002	2003	2004	2005	2006	2007	2000	2001	2002	2003	2004	2005	2006	2007	2000	2001	2002	2003	2004	2005	2006	2007	2000	2001	2002	2003	2004	2005	2006	2007
Afghanistan	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	346	326	304	308	283	267	251	238	41	39	36	37	34	33	31	30	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Bahrain	–	–	–	–	–	–	–	–	57	56	55	53	48	45	45	60	5	5	4	4	4	4	4	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Djibouti	179	190	198	205	211	217	222	227	761	775	932	960	1 034	1 046	1 093	1 104	70	69	80	82	86	88	90	91	35	33	53	55	60	61	64	65
Egypt	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	36	34	32	31	29	28	27	27	3	3	3	3	3	3	2	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Iran (Islamic Republic of)	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	40	38	37	35	32	31	29	27	4	3	3	3	3	3	3	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Iraq	–	–	–	–	–	–	–	–	71	69	65	67	71	75	78	79	10	10	9	9	10	10	11	11	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Jordan	–	–	–	–	–	–	–	–	11	9	9	9	9	8	9	9	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Kuwait	–	–	–	–	–	–	–	–	33	33	30	29	29	30	25	25	3	3	3	3	3	3	2	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lebanon	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	35	30	26	24	22	21	23	23	3	2	2	2	2	2	2	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Libyan Arab Jamahiriya	–	–	–	–	–	–	–	–	22	22	21	20	19	18	18	17	2	2	2	1	1	1	1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Morocco	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	98	95	87	91	89	85	82	80	10	10	9	9	9	9	8	8	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Oman	–	–	–	–	–	–	–	–	13	14	13	13	12	13	13	14	< 1	1	1	1	< 1	1	< 1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Pakistan	2	2	3	3	3	3	4	4	413	406	376	355	333	289	260	223	48	47	44	42	40	36	33	28	1	1	1	1	1	1	1	< 1
Qatar	–	–	–	–	–	–	–	–	78	78	75	71	71	69	77	81	7	7	7	7	6	6	7	7	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Saudi Arabia	–	–	–	–	–	–	–	–	67	65	62	60	60	60	62	65	6	5	5	5	5	5	5	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Somalia	14	15	16	16	16	17	17	17	414	398	391	362	334	325	341	352	67	61	61	58	49	45	49	55	7	8	8	8	7	7	7	8
Sudan	21	22	23	23	24	25	25	26	375	389	363	371	376	384	391	402	53	54	53	54	55	56	57	59	11	12	11	11	12	12	12	13
Syrian Arab Republic	–	–	–	–	–	–	–	–	41	37	35	33	31	30	29	27	3	3	3	3	2	2	2	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Tunisia	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	30	28	27	26	27	27	28	28	3	2	3	3	3	3	3	3	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
United Arab Emirates	–	–	–	–	–	–	–	–	27	27	27	25	25	24	24	24	2	2	2	2	2	2	2	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
West Bank and Gaza Strip	–	–	–	–	–	–	–	–	40	39	37	36	35	33	32	31	4	4	4	4	3	3	3	3	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Yemen	–	–	–	–	–	–	–	–	164	154	149	146	138	137	135	130	12	12	12	11	11	10	10	10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
EMR	**3**	**3**	**3**	**3**	**3**	**3**	**4**	**4**	**203**	**200**	**187**	**181**	**172**	**159**	**150**	**139**	**24**	**23**	**22**	**22**	**21**	**20**	**19**	**17**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**

Rates are per 100 000 population (total country population, including HIV-positive and HIV-negative people). Estimates for all years are re-calculated as new information becomes available and techniques are refined, so they may differ from those published previously. Data (including for years 1990 to 1999) can be downloaded from www.who.int/tb

Table A3.5 **Case notifications and case detection rates, DOTS and non-DOTS combined, Eastern Mediterranean, 2007**

	Notified TB cases, DOTS and non-DOTS combined															Estimated incidence and case detection rates				Proportions			
					New pulmonary			New extra-	Other	Re-treatment cases					New pulm.	Estimated incidence		Case detection rate		ss+	ss+	Extrapulm.	Re-treat.
	Population	All notified	New and relapse		ss+		ss- / unk.	pulmonary	new	Relapse	After failure	After default	Other re-treat.	Other	lab. confirm.	all forms	ss+	all new	new ss+	(% of	(% of	(% of	(% of
	thousands	number	number	rate	number	rate	number	number	number	number	number	number	number	number	number	number	number	%	%	pulm.)	new+relapse)	new+relapse)	new+re-treat.)
Afghanistan	27 145	28 769	28 769	106	13 213	49	8 251	6 227	0	1 078	0	0	0	0	13 213	45 676	20 554	61	64	62	46	22	4
Bahrain	753	296	296	39	109	14	71	114	0	2	0	0	0	0	109	305	137	96	79	61	37	39	1
Djibouti	833	3 257	3 195	384	1 208	145	329	1 492		166	48	14			1 208	6 769	2 856	45	42	79	38	47	7
Egypt	75 498	10 044	9 841	13	4 887	6	1 703	2 869	0	382	126	77	0	0	6 643	15 873	6 765	60	72	74	50	29	6
Iran (Islamic Republic of)	71 208	9 490	9 316	13	4 701	7	1 830	2 515	0	270	135	39	0	0	4 735	15 447	6 902	59	68	72	50	27	5
Iraq	28 993	7 863	7 863	27	2 726	9	2 293	2 290	0	554			0	0	3 280	16 241	7 308	45	37	54	35	29	7
Jordan	5 924	344	336	6	109	2	70	154	0	3	0	0	8	0	154	441	135	76	81	61	32	46	3
Kuwait	2 851	646	646	23	274	10	94	277	0	1	0	0	0	0	314	674	303	96	90	74	42	43	0
Lebanon	4 099	476	476	12	143	3	118	212	0	3	0	0	0	0	143	762	232	62	62	55	30	45	1
Libyan Arab Jamahiriya	6 160	2 119	2 119	34	772	13	523	824		0	0	0			1 544	1 060	477	200	162	60	36	39	
Morocco	31 224	25 562	25 562	82	11 937	38	2 059	11 566	0						12 067	28 617	12 863	89	93	85	47	45	
Oman	2 595	328	328	13	187	7	33	102	0	6	0	0	0	0	220	332	149	97	125	85	57	31	2
Pakistan	163 902	234 100	230 468	141	88 747	54	103 629	33 986	0	4 106	1 275	2 357	0	0	192 376	297 108	133 075	76	67	46	39	15	3
Qatar	841	399	399	47	116	14	75	208	0	0	0	0	0		116	588	264	68	44	61	29	52	
Saudi Arabia	24 735	4 013	3 955	16	1 984	8	582	1 297		92		58			1 984	11 442	5 149	34	39	77	50	33	4
Somalia	8 699	11 130	11 130	128	6 130	70	2 490	2 013	0	497	0	0	0	0	6 130	21 634	9 587	49	64	71	55	18	4
Sudan	38 560	29 379	29 270	76	12 627	33	9 486	5 171	0	1 986	22	82	5	0	12 627	93 808	41 221	29	31	57	43	18	7
Syrian Arab Republic	19 929	4 309	4 087	21	1 155	6	706	2 169	0	57	31	25	35	131	1 861	4 698	1 436	86	80	62	28	53	4
Tunisia	10 327	2 282	2 282	22	941	9	305	1 009	0	27					0	2 682	1 204	84	78	76	41	44	1
United Arab Emirates	4 380	97	97	2	56	1	20	16	0	5	0	0	0	0	62	692	311	13	18	74	58	16	5
West Bank and Gaza Strip	4 017	34	33	1	13	0	2	18	0	0	1	0	0	0	14	799	244	4	5	87	39	55	3
Yemen	22 389	8 427	8 427	38	3 537	16	2 196	2 369	0	325	0	0	0	0	3 537	17 121	7 704	47	46	62	42	28	4
EMR	**555 064**	**383 364**	**378 895**	**68**	**155 572**	**28**	**136 865**	**76898**	**0**	**9 560**	**1 638**	**2 652**	**48**	**131**	**262 337**	**582 767**	**258 877**	**63**	**60**	**53**	**41**	**20**	**4**

ss+ indicates sputum smear-positive; ss-, sputum smear-negative; unk., sputum smear result unknown; re-treat., re-treatment; pulm. lab. confirmed, pulmonary case confirmed by positive smear or culture. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.6 **DOTS coverage, case notifications and case detection rates, Eastern Mediterranean, 2007**

		TB cases reported from DOTS services													Estimated incidence and case detection rate				Proportions			
	DOTS			New pulmonary			New extra-	Other	Re-treatment cases					New pulm.	Estimated incidence		DOTS case detection rate		ss+	ss+	Extrapulm.	Re-treat.
	coverage	New and relapse		ss+		ss- / unk.	pulmonary	new	Relapse	After failure	After default	Other re-treat.	Other	lab. confirm.	all forms	ss+	all new	new ss+	(% of	(% of	(% of	(% of
	%	number	rate	number	rate	number	number	number	number	number	number	number	number	number	number	number	%	%	pulm.)	new+relapse)	new+relapse)	new+re-treat.)
Afghanistan	97	28 769	106	13 213	49	8 251	6 227	0	1 078	0	0	0	0	13 213	45 676	20 554	61	64	62	46	22	4
Bahrain	100	296	39	109	14	71	114	0	2	0	0	0	0	109	305	137	96	79	61	37	39	1
Djibouti	100	3 195	384	1 208	145	329	1 492		166	48	14			1 208	6 769	2 856	45	42	79	38	47	7
Egypt	100	9 841	13	4 887	6	1 703	2 869	0	382	126	77	0	0	6 643	15 873	6 765	60	72	74	50	29	6
Iran (Islamic Republic of)	100	9 316	13	4 701	7	1 830	2 515		270	135	39			4 735	15 447	6 902	59	68	72	50	27	5
Iraq	87	7 863	27	2 726	9	2 293	2 290	0	554			0	0	3 280	16 241	7 308	45	37	54	35	29	7
Jordan	100	336	6	109	2	70	154	0	3	0	0	8	0	154	441	135	76	81	61	32	46	3
Kuwait	100	646	23	274	10	94	277	0	1	0	0	0	0	314	674	303	96	90	74	42	43	0
Lebanon	100	476	12	143	3	118	212	0	3	0	0	0	0	143	762	232	62	62	55	30	45	1
Libyan Arab Jamahiriya	100	2 119	34	772	13	523	824		0	0	0			772	1 060	477	200	162	60	36	39	
Morocco	100	25 562	82	11 937	38	2 059	11 566	0						12 067	28 617	12 863	89	93	85	47	45	
Oman	100	328	13	187	7	33	102	0	6	0	0	0	0	220	332	149	97	125	85	57	31	2
Pakistan	99	230 468	141	88 747	54	103 629	33 986	0	4 106	1 275	2 357	0	0	192 376	297 108	133 075	76	67	46	39	15	3
Qatar	100	399	47	116	14	75	208	0	0	0	0	0		116	588	264	68	44	61	29	52	
Saudi Arabia	100	3 955	16	1 984	8	582	1 297		92		58			1 984	11 442	5 149	34	39	77	50	33	4
Somalia	100	11 130	128	6 130	70	2 490	2 013	0	497	0	0	0	0	6 130	21 634	9 587	49	64	71	55	18	4
Sudan	91	29 270	76	12 627	33	9 486	5 171	0	1 986	22	82	5	0	12 627	93 808	41 221	29	31	57	43	18	7
Syrian Arab Republic	100	4 087	21	1 155	6	706	2 169	0	57	31	25	35	131	1 861	4 698	1 436	86	80	62	28	53	4
Tunisia	100	2 282	22	941	9	305	1 009	0	27					0	2 682	1 204	84	78	76	41	44	1
United Arab Emirates	20	97	2	56	1	20	16	0	5	0	0	0	0	62	692	311	13	18	74	58	16	5
West Bank and Gaza Strip	45	33	1	13	0	2	18	0	0	1	0	0	0	14	799	244	4	5	87	39	55	3
Yemen	100	5 389	24	3 523	16	772	770	0	324	0	0	0	0	3 523	17 121	7 704	30	46	82	65	14	6
EMR	**97**	**375 857**	**68**	**155 558**	**28**	**135 441**	**75 299**	**0**	**9 559**	**1 638**	**2 652**	**48**	**131**	**261 551**	**582 767**	**258 877**	**63**	**60**	**53**	**41**	**20**	**4**

ss+ indicates sputum smear-positive; ss-, sputum smear-negative; unk., sputum smear result unknown; re-treat., re-treatment; pulm. lab. confirmed, pulmonary case confirmed by positive smear or culture. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.7 **Laboratory services, collaborative TB/HIV activities and management of MDR-TB, Eastern Mediterranean, 2006–2007**

	Laboratory services, 2007				Collaborative TB/HIV activities								Management of MDR-TB, 2007				
					2006				2007								
	Number of labs working with NTP			Smear labs included	TB pts tested for	TB pts	HIV+ TB pts	HIV+ TB pts	TB pts tested for	TB pts	HIV+ TB pts	HIV+ TB pts	Lab-confirmed	DST	MDR	Re-treatment	Re-treatment
	smear	culture	DST	in EQA	HIV	HIV-positive	CPT	ART	HIV	HIV-positive	CPT	ART	MDR	in new cases	in new cases	DST	MDR
Afghanistan	500	1		360					0	0	0	0	0	0	0	0	0
Bahrain	11	2	2	1	167	7	0	0	200	4	0						
Djibouti	14	0	0	13				95	396	54				0		0	
Egypt	293	18	1	216	361	12	12	12	482	9	9	9	277	393	8	506	269
Iran (Islamic Republic of)	314	27	2	314	1 087	210	9	4	732	171	16	24	43	386	4	144	39
Iraq	20	1	1	19	0	0	0	0	0	0	0	0	9	0	0	34	9
Jordan	150	50	1	12	104	0	0	0	112	1	1	1	5	70	1	33	4
Kuwait	12	1	1	12	644	2	2	2	646	2	2	2	8	645	7	1	1
Lebanon	168	4	1	6	5	5	0	0	113	0	0	0	2	8	0	11	2
Libyan Arab Jamahiriya	24	3	3	24					116	116		116	1	1	1		
Morocco	158	14	2	158	0				0				59	52	39	24	9
Oman	205	10	1	205	334	10	10	10	328	14	14	14	5	141	3	15	2
Pakistan	1 131	3	1	360	0	0	0	0	0	0	0	0	0	0	0	0	0
Qatar	1	1	1	1	339	0	0	0	399	1	1	1		399			
Saudi Arabia	320	11	11	0													
Somalia	47	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0
Sudan	321	1	1	186	189	20	20	0	490	97	59	97	51	43	21	135	30
Syrian Arab Republic	65	1	1	14	267	0	0	0	14	1	0	1	12	4	2	22	10
Tunisia	66	7	5	0	112	3	5	3	98	7	0	7	12				
United Arab Emirates	24	3											1				1
West Bank and Gaza Strip	5	1	0	0	42	0	0	0	34	0	0	0	0	0	0	0	0
Yemen	245	3	1	245	6	6	0	0	0	0	0	0	1	74	1	13	1
EMR	**4 094**	**162**	**36**	**2 158**	**3 657**	**275**	**58**	**126**	**4 160**	**477**	**102**	**272**	**486**	**2 216**	**87**	**938**	**377**

ART indicates antiretroviral therapy; CPT, co-trimoxazole preventive therapy; DST, drug susceptibility testing; EQA, external quality assurance; HIV+, HIV-positive; pts, patients. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.8 **Treatment outcomes, Eastern Mediterranean, 2006 cohort**

	New smear-positive cases, DOTS											New smear-positive cases, non-DOTS											Smear-positive re-treatment cases, DOTS								
	Number of cases		% of notif	% of cohort							%	Number of cases		% of notif	% of cohort							%	Number	% of cohort							%
	Notified	Regist'd	regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	Success	Notified	Regist'd	regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	Success	Regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	Success
Afghanistan	12 468	12 468	100	80	5	2	1	2	6	5	84												1 132	74	5	3	2	2	6	8	79
Bahrain	98	14	14	86	0	14	0	0	0	0	86																				
Djibouti	1 153	1 143	99	70	8	1	1	16	4	0	78												276	59	10	4	4	20	3	0	69
Egypt	4 745	4 745	100	71	16	3	3	3	3	0	87												799	47	22	6	12	6	6	0	69
Iran (Islamic Republic of)	4 802	4 923	103	77	6	7	3	3	3	1	83												485	66	8	11	3	6	2	5	74
Iraq	2 886	2 886	100	77	8	2	3	9	2	0	84												748	63	12	2	5	16	2	0	75
Jordan	104	104	100	58	13	8	4	17	0	0	71												26	31	46	0	4	15	4	0	77
Kuwait	284	284	100	45	33	0	0	5	16	0	78												0							0	
Lebanon	112	112	100	83	7	4	0	5	1	0	90												8	63	38	0	0	0	0	0	100
Libyan Arab Jamahiriya	745	745	100	45	32	1	0	20	2	1	77																				
Morocco	12 280	12 280	100	80	7	2	1	9	1	0	87												1 732	54	18	3	3	16	5	0	72
Oman	184	118	64	86	0	12	0	0	2	0	86		66		0	0	0	0	0	100	0	0	5	100	0	0	0	0	0	0	100
Pakistan	65 253	65 589	101	75	13	3	1	6	2	0	88												5 566	59	18	4	3	11	4	0	77
Qatar	115	115	100	62	7	1	0	0	27	3	69																				
Saudi Arabia	1 914	1 863	97	62	7	6	1	7	0	17	69												101	53	10	6	1	14	1	15	63
Somalia	6 861	6 861	100	86	3	3	1	4	3	0	89												534	73	5	9	4	7	2	0	78
Sudan	12 194	12 150	100	67	14	2	1	7	2	5	82												2 043	52	28	1	0	7	8	2	80
Syrian Arab Republic	1 352	1 352	100	74	13	3	2	7	2	0	86												279	28	43	5	4	18	2	0	71
Tunisia	922	901	98	84	7	3	1	3	2	0	91																				
United Arab Emirates	52	52	100	44	35	4	2	15	0	0	79												4	25	50	25	0	0	0	0	75
West Bank and Gaza Strip	16	16	100	50	44	6	0	0	0	0	94												0							0	
Yemen	3 280	3 280	100	74	9	3	2	7	4	1	83	62	57	92	54	18	2	0	19	7	0	72	301	66	7	5	3	5	2	11	73
EMR	**131 820**	**132 001**	**100**	**75**	**11**	**3**	**1**	**6**	**3**	**1**	**86**	**62**	**123**	**198**	**25**	**8**	**1**	**0**	**9**	**57**	**0**	**33**	**14 039**	**58**	**18**	**4**	**3**	**11**	**5**	**2**	**76**

Not eval. indicates not evaluated (percentage of registered cases for which outcomes were not recorded); success, sum of cured and completed; cases regist'd, the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2006 is used as the denominator for calculating treatment outcomes unless it is less than the sum of outcomes, in which case the sum of outcomes is used. If the number of cases registered is not reported, then the number of cases notified in 2006 is used, or the sum of outcomes if the latter is greater. Data can be downloaded from www.who.int/tb

Table A3.9 **DOTS re-treatment outcomes, Eastern Mediterranean, 2006 cohort**

	Relapse, DOTS									After failure, DOTS									After default, DOTS								
		% of cohort									% of cohort									% of cohort							
	Number regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	% Success	Number regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	% Success	Number regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	% Success
Afghanistan	1 132	74	5	3	2	2	6	8	79																		
Bahrain																											
Djibouti	192	63	7	2	2	25	3	0	69	62	58	16	8	6	8	3	0	74	22	36	18	9	18	14	5	0	55
Egypt	445	50	23	5	12	4	5	0	73	194	40	23	9	12	7	8	1	63	160	49	18	8	11	9	5	0	67
Iran (Islamic Republic of)	315	65	9	13	3	3	2	5	73	135	73	5	5	3	7	3	4	78	35	54	11	11	0	17	6	0	66
Iraq	603	65	10	2	4	16	2	0	75	60	60	13	3	13	10	0	0	73	85	47	27	1	2	22	0	0	74
Jordan	4	75	0	0	0	25	0	0	75	5	80	0	0	20	0	0	0	80	0								
Kuwait	0									0									0								
Lebanon	8	63	38	0	0	0	0	0	100	0									0								
Libyan Arab Jamahiriya																											
Morocco	1334	70	6	3	3	13	5	0	76	83		67	6	7	17	2	0	67	231		49	5	4	38	3	0	49
Oman	5	100	0	0	0	0	0	0	100	0									0								
Pakistan	3008	67	15	4	3	7	4	0	82	724	52	22	5	5	8	8	0	74	1834	49	20	4	3	20	4	0	69
Qatar																											
Saudi Arabia	101	53	10	6	1	14	1	15	63																		
Somalia	534	73	5	9	4	7	2	0	78	0									0								
Sudan	141	75	13	4	2	5	0	0	89	38	61	11	8	11	11	0	0	71	32	66	16	6	3	9	0	0	81
Syrian Arab Republic	66	50	17	9	6	15	3	0	67	21	67	10	5	10	5	5	0	76	36	25	19	3	3	44	6	0	44
Tunisia																											
United Arab Emirates	4	25	50	25	0	0	0	0	75	0									0								
West Bank and Gaza Strip	0									0									0								
Yemen	301	66	7	5	3	5	2	11	73	0									0								
EMR	**8 193**	**67**	**11**	**4**	**3**	**8**	**4**	**2**	**78**	**1 322**	**50**	**22**	**6**	**7**	**9**	**6**	**0**	**72**	**2 435**	**44**	**23**	**4**	**4**	**21**	**4**	**0**	**67**

Not eval. indicates not evaluated (percentage of registered cases for which outcomes were not recorded); success, sum of cured and completed; cases regist'd, the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2006 is used as the denominator for calculating treatment outcomes unless it is less than the sum of outcomes, in which case the sum of outcomes is used. If the number of cases registered is not reported, then the number of cases notified in 2006 is used, or the sum of outcomes if the latter is greater. Data can be downloaded from www.who.int/tb

Table A3.10 **DOTS treatment success and case detection rates, Eastern Mediterranean, 1994–2007**

	DOTS new smear-positive treatment success (%)													DOTS new smear-positive case detection rate (%)												
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Afghanistan				45	33	87	86	84	87	86	89	90	84			4	12	11	18	29	39	37	45	52	63	64
Bahrain					13	95	73	87	88	97	82	93	86					15	17	17	12	12	51	74	72	79
Djibouti		75	77	76	79	72	62	78	82	73	80	80	78		96	100	84	75	63	57	53	49	42	42	42	42
Egypt	52		81	82	87	87	87	82	88	80	70	79	87	50	1	13	20	38	54	59	65	70	76	75	69	72
Iran (Islamic Republic of)			87	84	83	82	85	85	85	84	84	83	83	42		12	35	54	58	61	61	62	63	62	67	68
Iraq					83	85	92	89	91	85	85	86	84				5	13	51	55	59	53	49	44	40	37
Jordan	90				92	88	90	86	89	87	85	83	71	106			76	77	70	78	75	91	73	66	78	81
Kuwait						66	69	73	55	62	63	63	78					62	65	62	71	70	85	63	95	90
Lebanon	89				73	96	92	91	91	92	90	92	90	41				75	65	64	63	63	72	65	52	62
Libyan Arab Jamahiriya					68	67			61	62	64	69	77					148	113		138	149	175	176	154	162
Morocco	86	90	88	89	88	88	89	87	89	86	87	81	87	91	93	93	90	91	89	90	92	93	91	96	94	93
Oman		84	87	91	86	95	93	90	92	90	90	90	86		121	121	121	91	123	112	117	85	128	95	129	125
Pakistan	74	70		67	66	70	74	77	78	79	82	83	88	1	2		4	2	3	5	13	17	25	38	50	67
Qatar	83	81	72	79	84	74	66	60	75	73	78	83	69	33	27	24	43	33	29	41	34	52	38	46	49	44
Saudi Arabia					57	66	73	77	76	79	82	65	69					21	36	38	39	38	38	38	39	39
Somalia		86	84	90	88	88	83	86	89	90	91	89	89		33	43	43	46	48	58	58	61	74	78	74	64
Sudan				70	65	81	79	80	78	82	77	82	82		2	1	27	27	32	29	31	31	33	34	31	31
Syrian Arab Republic			92	88	88	84	79	81	87	88	86	89	86			16	40	56	84	88	87	96	100	89	91	80
Tunisia					91	91	91	90	92	91	90	90	91					94	101	103	90	85	88	83	80	78
United Arab Emirates							74	62	79	64	70	73	79						27	25	20	27	19	21	17	18
West Bank and Gaza Strip									100	80	50	100	94						15	12		6	2	3	7	5
Yemen		66	78	81	80	79	75	80	80	82	82	80	83	1	8	29	37	51	55	52	48	45	41	41	42	46
EMR	**82**	**87**	**86**	**79**	**77**	**83**	**83**	**83**	**84**	**83**	**83**	**83**	**86**	**12**	**10**	**12**	**19**	**21**	**25**	**27**	**32**	**34**	**39**	**46**	**52**	**60**

Treatment success, sum of cured and completed; DOTS new smear-positive case detection rate, notified new smear-positive cases divided by estimated incident cases. Figures for all years are updated as new information becomes available and/or techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.11 **New smear-positive case notification by age and sex, DOTS and non-DOTS, Eastern Mediterranean, 2007**

	Male							Female							All							Male/female
	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+	ratio
Afghanistan	186	856	840	597	566	630	507	475	2 224	2 357	1 708	1 143	771	353	661	3 080	3 197	2 305	1 709	1 401	860	0.5
Bahrain	0	8	26	15	8	4	3	1	10	15	5	3	0	1	1	18	41	20	11	4	4	1.8
Djibouti	14	241	264	142	83	44	23	8	129	131	62	35	14	18	22	370	395	204	118	58	41	2.0
Egypt	35	588	853	629	643	359	214	25	500	325	245	225	173	72	60	1088	1178	874	868	532	286	2.1
Iran (Islamic Republic of)	10	311	511	330	285	261	680	42	394	236	173	268	387	813	52	705	747	503	553	648	1493	1.0
Iraq	20	319	531	276	223	188	126	34	289	228	154	134	130	74	54	608	759	430	357	318	200	1.6
Jordan	0	7	20	14	9	7	5	0	9	12	6	1	12	7	0	16	32	20	10	19	12	1.3
Kuwait	1	16	69	25	29	8	5	0	26	53	18	13	7	4	1	42	122	43	42	15	9	1.3
Lebanon	0	12	19	13	12	11	5	1	17	30	13	5	3	2	1	29	49	26	17	14	7	1.0
Libyan Arab Jamahiriya	2	61	143	78	26	12	10	4	23	17	12	8	7	11	6	84	160	90	34	19	21	4.0
Morocco	74	2 098	2 370	1 545	1 165	545	529	123	1 177	837	444	354	306	370	197	3275	3207	1989	1519	851	899	2.3
Oman	0	16	25	25	20	13	8	3	22	13	11	10	7	14	3	38	38	36	30	20	22	1.3
Pakistan	1 017	9 598	8 790	7 717	7 237	6 258	5 156	2 443	11 522	9 162	7 352	5 496	4 065	2 934	3460	21120	17952	15069	12733	10323	8090	1.1
Qatar	0	26	38	19	10	4	0	1	4	6	5	3	0	0	1	30	44	24	13	4	0	5.1
Saudi Arabia	8	246	312	219	187	111	92	30	298	197	110	71	39	64	38	544	509	329	258	150	156	1.5
Somalia	125	1 239	1 008	578	407	296	289	135	602	520	378	243	181	129	260	1841	1528	956	650	477	418	1.8
Sudan	288	1 355	1 903	1 540	1 102	729	556	334	992	1 318	990	729	467	324	622	2347	3221	2530	1831	1196	880	1.4
Syrian Arab Republic	7	198	222	123	74	49	59	14	148	106	41	43	30	41	21	346	328	164	117	79	100	1.7
Tunisia	1	124	171	117	104	71	75	11	69	54	42	28	29	45	12	193	225	159	132	100	120	2.4
United Arab Emirates	2	5	6	3	4	3	10	1	8	6	3	2	0	0	3	13	12	6	6	3	10	1.7
West Bank and Gaza Strip	1	1	3	2	0	3	1	0	0	1	0	0	2	0	1	1	4	2	0	5	1	3.7
Yemen	23	488	626	379	252	165	119	50	430	374	272	189	113	57	73	918	1000	651	441	278	176	1.4
EMR	**1 814**	**17 813**	**18 750**	**14 386**	**12 446**	**9 771**	**8 472**	**3 735**	**18 893**	**15 998**	**12 044**	**9 003**	**6 743**	**5 333**	**5 549**	**36 706**	**34 748**	**26 430**	**21 449**	**16 514**	**13 805**	**1.2**

For some countries, breakdown of notified cases by age and sex is missing, or is provided for a subset of cases. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.12 **New smear-positive case notification rates by age and sex, DOTS and non-DOTS, Eastern Mediterranean, 2007**

	Male							Female							All						
	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+
Afghanistan	3	31	45	48	71	128	173	8	86	138	150	155	163	115	5	57	89	96	111	145	143
Bahrain	0	12	28	18	13	17	26	1	18	26	9	9	0	8	1	15	27	15	11	11	17
Djibouti	9	267	407	310	286	241	200	5	145	206	136	116	70	125	7	207	307	223	199	151	159
Egypt	0	8	14	15	18	16	13	0	7	6	6	6	8	4	0	7	10	11	12	12	8
Iran (Islamic Republic of)	0	3	8	8	9	16	44	0	5	4	4	9	20	51	0	4	6	6	9	18	47
Iraq	0	11	25	18	23	35	33	1	10	11	10	14	23	16	0	10	18	14	18	29	24
Jordan	0	1	4	3	5	6	5	0	2	2	2	1	10	7	0	1	3	3	3	8	6
Kuwait	0	7	15	7	15	12	15	0	13	20	9	13	18	17	0	9	17	7	15	14	16
Lebanon	0	3	6	5	6	8	3	0	5	9	4	2	2	1	0	4	7	5	4	5	2
Libyan Arab Jamahiriya	0	10	23	19	9	7	8	0	4	3	3	4	5	9	0	7	13	11	7	6	8
Morocco	2	65	97	84	73	63	70	3	36	31	22	22	35	41	2	51	62	51	48	48	54
Oman	0	6	9	12	15	23	21	1	8	6	10	13	17	39	0	7	8	11	14	20	30
Pakistan	3	50	71	86	107	158	163	9	64	79	88	88	107	88	6	57	75	87	98	133	124
Qatar	0	38	26	15	11	14	0	1	9	11	10	12	0	0	1	26	22	14	11	11	0
Saudi Arabia	0	11	12	10	15	23	26	1	13	10	8	10	10	19	0	12	11	9	13	17	22
Somalia	6	153	160	140	151	193	281	7	74	81	88	84	107	104	7	113	120	114	116	148	184
Sudan	4	34	66	79	85	86	87	4	26	47	51	55	51	43	4	30	56	65	70	68	63
Syrian Arab Republic	0	9	13	11	11	13	20	0	7	6	4	6	8	12	0	8	9	8	9	11	16
Tunisia	0	11	18	16	19	24	25	1	7	6	6	5	9	13	0	9	12	11	12	16	18
United Arab Emirates	0	1	1	0	1	3	34	0	3	2	1	2	0	0	0	2	1	1	2	3	20
West Bank and Gaza Strip	0	0	1	1	0	5	2	0	0	0	0	0	3	0	0	0	1	1	0	4	1
Yemen	0	20	40	41	40	46	49	1	18	25	29	29	29	20	1	19	33	35	34	38	33
EMR	**2**	**29**	**41**	**45**	**54**	**75**	**82**	**4**	**32**	**38**	**40**	**42**	**51**	**47**	**3**	**31**	**39**	**43**	**48**	**63**	**64**

Rates are per 100 000 population of each age/sex group. Rates are calculated excluding those countries for which breakdown of notified cases or population by age and sex is missing. Data can be downloaded from www.who.int/tb

Table A3.13 **TB case notifications, Eastern Mediterranean, 1980–2007**

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Afghanistan	71 685	71 554	41 752	52 502	18 784	10 742	14 351	18 091	16 051	14 386	4 332	23 067						1 290	3 084	3 314	7 107	10 139	13 794	13 808	18 404	21 844	25 475	28 769
Bahrain	219	262	156	232	208	194	156	120	142	122	117	142	140	114		43	49	45	83	145	207	188	191	261	244	280	278	296
Djibouti		2 265	671		1 489	2 262	1 864	1 978	2 030	2 040	2 100	2 900	2 884	3 489	3 311		3 332	3 830	3 785	4 133	3 971	4 198	3 191	3 231	2 940	3 109	3 011	3 195
Egypt	1 637	1 306	1 805	1 932	1 572	1 308	1 209	22 063	1 378	1 492	2 142	3 634	8 876	3 426	3 911	11 145	12 338	13 971	12 662	11 763	10 762	10 549	11 177	11 490	11 620	11 446	10 046	9 841
Iran (Islamic Republic of)	42 717	11 728	9 509	8 589	10 493	8 728	8 032	10 034	9 967	12 005	9 255	14 246	14 121	20 569	13 021	15 936	14 189	12 659	11 794	12 062	11 850	11 783	11 464	10 900	10 171	9 192	9 361	9 316
Iraq	11 809	10 614	7 741	6 970	6 807	6 485	6 846	6 517	11 384	14 312	14 735	13 527	14 905	18 553	19 733	9 697	29 196	26 607	29 410	29 897	9 697	10 478	11 898	11 656	10 498	9 454	8 043	7 863
Jordan	298	646	860	856	672	769	592	537	553	484	439	390	504	427	443	498	468	397	380	373	306	342	312	310	324	367	359	336
Kuwait	847	819	880	855	812	717	611	540	480	468	277	330	282	217	237	336	400	528	564	515	513	496	585	566	557	517	644	646
Lebanon		67	75	284	410	1 943	2 257	2 478				884	884		940	983	836	701	640	679	571	516	437	380	393	391	375	476
Libyan Arab Jamahiriya	718	481	512	610	357	325	276	331	416	265	442	239	1 164			1 440	1 282		1 575	1 615	1 341		1 824	1 917	1 653	2 098	2 022	2 119
Morocco	24 878	28 637	28 095	26 944	22 279	26 790	27 553	27 159	25 717	26 756	27 658	27 638	25 403	27 626	30 316	29 829	31 771	30 227	29 087	29 854	28 852	28 285	29 804	26 789	25 909	26 269	26 099	25 562
Oman	1 872	928	897	802	843	861	1 265	616	477	478	482	442	367	281	304	276	300	298	287	249	321	292	290	255	292	261	339	328
Pakistan	316 340	324 576	326 492	117 739	91 572	111 419	149 004	179 480	194 323	170 562	156 759	194 323		73 175		13 142	4 307		89 599	20 936	11 050	34 066	52 762	70 485	94 327	142 211	176 678	230 468
Qatar	257	213	172	206	203	250	220	248	223	191	184	195		200		304	257	212	253	259	279	284	278	276	272	325	339	399
Saudi Arabia	10 956	8 263	8 529	7 551	7 163	3 966	3 696	3 029	2 433	2 583	2 415	2 221	2 016	2 386	2 518			3 138	3 235	3 507	3 452	3 327	3 374	3 317	3 312	3 539	3 774	3 955
Somalia				2 838	2 719	2 722	3 079	7 322	2 728	1 323					2 023	2 504	3 920	4 450	4 320	4 802	5 686	6 852	7 391	9 278	11 747	12 904	11 864	11 130
Sudan	32 971	47 431				1 509	2 460	800	693	701	212	16 423	19 503	37 516	23 178	14 320	20 230	20 894	22 318	26 875	24 807	23 997	24 554	25 105	26 567	27 562	28 937	29 270
Syrian Arab Republic	1 689	1 908	1 838	1 867	2 111	2 163	3 942	4 290	4 952	5 504	6 018	5 651	5 437		5 127	4 404	5 200	4 972	5 417	5 447	5 090	4 997	4 766	4 820	4 588	4 310	3 931	4 087
Tunisia	2 504	2 316	2 554	3 062	2 501	2 510	2 487	2 272	2 309	2 403	2 054	2 064	2 164	2 565	2 376	2 383	2 387		2 211	2 158	2 038	1 945	1 885	1 965	1 994	2 079	2 131	2 282
United Arab Emirates	522	638	597	507	534	568	464	818	339	308	285	234	227		426		507		773	66	115	74	90	117	92	103	90	97
West Bank and Gaza Strip	191	139	136	136	123	113	63	82	85	145	64	89	97			77	40		18		82	67		36	23	28	42	33
Yemen									3 446	4 913	4 650	6 844	10 113	11 076	11 510	14 428	14 364	12 013	12 383	13 085	13 651	13 029	11 677	10 413	10 016	9 063	8 468	8 427
EMR	**522 110**	**514 791**	**433 271**	**234 482**	**171 652**	**186 344**	**230 427**	**288 805**	**280 126**	**261 441**	**234 620**	**315 483**	**109 087**	**201 620**	**119 374**	**121 745**	**145 373**	**136 232**	**233 878**	**171 734**	**141 748**	**165 904**	**191 744**	**207 375**	**235 943**	**287 352**	**322 306**	**378 895**
Number reporting	18	20	19	19	20	21	21	21	21	21	20	21	18	15	16	18	20	17	22	21	22	21	21	22	22	22	22	22
% reporting	82	91	86	86	91	95	95	95	95	95	91	95	82	68	73	82	91	77	100	95	100	95	95	100	100	100	100	100

From 1995 on, number shown is all notified new and relapse cases (DOTS and non-DOTS). Figures for all years are updated as new information becomes available, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.14 **TB case notification rates, Eastern Mediterranean, 1980–2007**

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Afghanistan	514	521	312	403	149	87	119	152	135	119	34	171						7	16	16	34	47	62	60	76	87	98	106
Bahrain	63	73	42	60	52	47	36	27	31	26	24	28	27	21		7	8	7	13	23	32	28	28	38	34	39	38	39
Djibouti		640	184		388	562	434	427	406	382	375	500	487	580	542		519	577	551	583	544	562	418	416	372	387	368	384
Egypt	4	3	4	4	3	3	2	43	3	3	4	6	15	6	7	18	20	22	20	18	16	16	16	16	16	16	14	13
Iran (Islamic Republic of)	109	29	22	19	23	18	16	19	19	22	16	25	24	34	21	26	22	20	18	18	18	18	17	16	15	13	13	13
Iraq	84	73	52	45	43	40	41	38	65	79	80	71	76	91	94	45	131	116	124	123	39	41	45	43	38	34	28	27
Jordan	13	28	36	34	26	28	21	19	19	16	13	11	14	11	11	12	11	9	8	8	6	7	6	6	6	7	6	6
Kuwait	62	57	58	55	50	42	34	28	23	22	13	16	14	12	13	19	23	29	29	24	23	21	24	22	21	19	23	23
Lebanon		2	3	10	14	67	78	85				29	28		28	28	23	19	17	18	15	14	11	10	10	10	9	12
Libyan Arab Jamahiriya	23	15	15	17	10	8	7	8	10	6	10	5	26			30	26		31	31	25		33	34	29	35	33	34
Morocco	127	143	136	127	102	120	121	116	108	110	111	109	99	106	114	111	116	109	103	105	100	97	101	90	86	86	85	82
Oman	158	74	68	58	58	56	79	37	28	27	26	23	19	14	14	13	13	13	12	11	13	12	12	10	12	10	13	13
Pakistan	399	396	384	133	100	117	151	175	183	156	139	167		60		10	3		65	15	8	23	35	46	61	90	110	141
Qatar	112	85	62	68	61	69	57	61	52	42	39	40		40		58	48	38	44	44	45	44	40	38	36	41	41	47
Saudi Arabia	114	81	79	66	59	31	27	21	16	16	15	13	12	14	14			16	16	17	17	16	15	15	14	15	16	16
Somalia				43	42	42	47	111	41	20					32	40	62	69	65	70	81	94	99	120	148	157	140	128
Sudan	168	234				7	10	3	3	3	1	62	72	134	81	49	67	67	70	82	74	70	71	71	74	75	77	76
Syrian Arab Republic	19	20	19	19	20	20	35	37	41	45	47	43	40		36	30	35	32	34	34	31	29	27	27	25	23	20	21
Tunisia	39	35	38	44	35	34	33	30	29	30	25	25	25	30	27	27	26		24	23	21	20	19	20	20	21	21	22
United Arab Emirates	51	58	51	40	40	40	31	52	20	17	15	12	11		19		20		27	2	4	2	2	3	2	3	2	2
West Bank and Gaza Strip	13	9	9	8	7	6	3	4	4	7	3	4	4			3	1		1		3	2		1	1	1	1	1
Yemen									30	42	38	53	75	78	77	93	89	72	72	74	75	70	61	52	49	43	39	38
EMR	**184**	**176**	**144**	**75**	**53**	**56**	**67**	**82**	**77**	**70**	**61**	**80**	**27**	**49**	**28**	**28**	**33**	**30**	**50**	**36**	**29**	**34**	**38**	**40**	**45**	**54**	**59**	**68**

Rates are per 100 000 population. From 1995 on, number shown is notification rate of new and relapse cases. Figures for all years are updated as new information becomes available and/or techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.15 **New smear-positive cases notified, Eastern Mediterranean, 1990–2007**

	Number of cases																	
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Afghanistan								618	1 833	1 669	2 892	4 639	6 509	6 510	8 273	9 949	12 468	13 213
Bahrain				82		17	31	22	25	21	23	23	17	16	69	101	98	109
Djibouti				1 668	1 743		1 744	1 904	1 690	1 564	1 391	1 312	1 253	1 202	1 086	1 120	1 153	1 208
Egypt					1 811	4 229	5 084	5 469	4 915	5 094	4 606	4 514	4 889	5 118	5 383	5 217	4 745	4 887
Iran (Islamic Republic of)					4 615	5 347	5 373	5 253	5 105	5 426	5 361	5 529	5 366	5 188	4 900	4 581	4 802	4 701
Iraq	1 587	1 512	2 304	5 240	5 781	3 194	10 320	8 164	8 933	9 908	3 194	3 559	3 895	3 577	3 381	3 096	2 886	2 726
Jordan				173	161	187	170	136	110	102	89	94	91	108	91	86	104	109
Kuwait				148	155	175	153	201	185	169	180	174	206	201	247	187	284	274
Lebanon					148	197	198	206	224	249	202	171	148	134	146	131	112	143
Libyan Arab Jamahiriya							515			803	607		722	764	872	860	745	772
Morocco						14 171	14 278	14 134	13 426	13 420	12 872	12 804	12 914	12 842	12 280	12 757	12 280	11 937
Oman				123	135	135	164	165	156	120	164	156	151	110	160	131	184	187
Pakistan				11 020		2 578	1 849		14 974	6 248	3 285	10 935	16 380	21 301	31 557	48 319	65 253	88 747
Qatar						60	46	39	69	58	53	77	64	95	73	96	115	116
Saudi Arabia				800				1 568	1 644	1 680	1 595	1 686	1 674	1 646	1 683	1 722	1 914	1 984
Somalia					1 168	1 572	2 894	3 093	3 121	3 461	3 776	4 640	4 818	5 190	6 479	7 068	6 861	6 130
Sudan					3 728	8 761	8 978	10 835	10 820	11 047	12 311	11 136	10 338	11 003	12 095	12 730	12 194	12 627
Syrian Arab Republic						1 295	1 523	1 423	1 593	1 577	1 584	1 507	1 447	1 545	1 561	1 350	1 352	1 155
Tunisia				1 006	983	1 243	1 005		1 196	1 066	1 099	1 077	927	878	944	915	922	941
United Arab Emirates										31	73	69	57	77	57	62	52	56
West Bank and Gaza Strip						9	24		8		37	31		15	4	7	16	13
Yemen	0	0	0	0	0	3 681	4 371	4 717	4 896	5 427	5 565	4 968	4 259	3 793	3 434	3 379	3 342	3 537
EMR	**1 587**	**1 512**	**2 304**	**20 260**	**20 428**	**46 851**	**58 720**	**57 947**	**74 923**	**69 140**	**60 959**	**69 101**	**76 125**	**81 313**	**94 775**	**113 864**	**131 882**	**155 572**

	Rate (per 100 000 population)																					
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Afghanistan								3	9	8	14	22	29	28	34	40	48	49
Bahrain				15		3	5	4	4	3	4	3	3	2	10	14	13	14
Djibouti				277	285		272	287	246	220	191	176	164	155	137	139	141	145
Egypt					3	7	8	9	8	8	7	7	7	7	8	7	6	6
Iran (Islamic Republic of)					8	9	9	8	8	8	8	8	8	8	7	7	7	7
Iraq	9	8	12	26	28	15	46	35	38	41	13	14	15	13	12	11	10	9
Jordan				4	4	4	4	3	2	2	2	2	2	2	2	2	2	2
Kuwait				8	9	10	9	11	9	8	8	7	8	8	9	7	10	10
Lebanon					4	6	6	6	6	7	5	4	4	3	4	3	3	3
Libyan Arab Jamahiriya							10			15	11		13	13	15	15	12	13
Morocco						53	52	51	48	47	45	44	44	43	41	42	40	38
Oman				6	6	6	7	7	7	5	7	6	6	4	6	5	7	7
Pakistan				9		2	1		11	4	2	7	11	14	20	31	41	54
Qatar						11	9	7	12	10	9	12	9	13	10	12	14	14
Saudi Arabia				5				8	8	8	8	8	8	7	7	7	8	8
Somalia					19	25	46	48	47	51	54	64	64	67	81	86	81	70
Sudan					13	30	30	35	34	34	37	33	30	31	33	34	32	33
Syrian Arab Republic						9	10	9	10	10	10	9	8	9	8	7	7	6
Tunisia				12	11	14	11		13	11	11	11	9	9	9	9	9	9
United Arab Emirates										1	2	2	2	2	1	2	1	1
West Bank and Gaza Strip						0	1		0		1	1		0	0	0	0	0
Yemen	0	0	0	0	0	24	27	28	29	31	31	27	22	19	17	16	15	16
EMR	**< 1**	**< 1**	**< 1**	**5**	**5**	**11**	**13**	**13**	**16**	**15**	**13**	**14**	**15**	**16**	**18**	**21**	**24**	**28**

Rates are per 100 000 population. Figures for all years are updated as new information becomes available and/or techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.16 **NTP budgets, available funding, cost of utilization of general health-care services and total TB control costs (US$ millions), Eastern Mediterranean, 2009**

		Available funding							
	NTP budget	Government (excluding loans)	Loans	Grants (excluding Global Fund)	Global Fund	Funding gap	Cost of utilization of general health-care services	Total TB control costs	Completeness of budget data
Afghanistan	10	0	0	5	4	0	1	11	C
Bahrain									N
Djibouti	0	0	0	0	0	< 0.01	1	1	C
Egypt	12	9	0	0	2	1	7	19	C
Iran (Islamic Republic of)									N
Iraq	41	20	0	0	1	20	1	42	C
Jordan	2	1	0.02	0	0	0	0	2	C
Kuwait	5	5	0	0	0	0	1	6	C
Lebanon	0	0	0	< 0.01	0	0	1	1	C
Libyan Arab Jamahiriya									N
Morocco	3	2	0	< 0.01	1	< 0.01	2	6	C
Oman									N
Pakistan	54	10	0	12	6	25	4	58	C
Qatar							0	0	N
Saudi Arabia									N
Somalia	0	0	0	0	1	< 0.01	2	2	P
Sudan	10	1	0	1	5	3	2	12	C
Syrian Arab Republic	0	6	0	0	2	0	1	1	C
Tunisia	5	1	0	0	3	1	1	6	C
United Arab Emirates							0	0	N
West Bank and Gaza Strip	1	0	0	0	1	0.03	0.05	1	C
Yemen	6	2	0	0	1	3	1	7	C
EMR	**151**	**60**	**0**	**19**	**28**	**52**	**25**	**176**	**64%**

N indicates data not available or not applicable; P indicates partial financial data; C indicates complete data and therefore included in analysis presented in chapter 3. Completeness of budget data in total row indicates percentage of countries providing complete financial data. Data can be downloaded from www.who.int/tb

Notes

Bahrain

TABLES A3.5 AND A3.6: of the 296 notified TB cases, 231 were in non-nationals; of the 109 new smear-positive cases notified, 91 were in non-nationals.

Lebanon

TABLES A3.1–A3.4: estimates will be further reviewed in 2009 based on additional in-depth analysis of national and subnational notification data.

Pakistan

TABLES A3.5 AND A3.6: according to data from three provinces (which account for 90% of notified cases), 19% of all notified new cases were reported from PPM initiatives.

Somalia

TABLES A3.1–A3.4: estimates will be further reviewed in 2009 based on additional in-depth analysis of national and subnational notification data.

Sudan

TABLE A3.6: DOTS coverage is the weighted average of coverage in the northern (100% coverage) and southern (55% coverage) parts of the country, which account for 80% and 20% of the total population, respectively.

TABLE A3.7: the numbers of laboratories performing culture and DST do not include those in the southern part of the country.

Yemen

TABLES A3.1–A3.4: estimates will be further reviewed in 2009 based on additional in-depth analysis of national and subnational notification data.

EUROPE

Europe

NTP MANAGER (OR EQUIVALENT) AND/OR PERSON(S) RESPONSIBLE FOR COMPLETING DATA COLLECTION FORM	
Albania	Hasan Hafizi; Donika Bardhi
Andorra	Carmen Pallares Papaseit; Jennifer Fernandez
Armenia	Vagan Rasailovich Pogosyan; Narine Mejlimyan
Austria	Jean-Paul Klein
Azerbaijan	Faig Frudinovich Agayev; Natavan Alikhanova
Belarus	Gennady Lvovich Gurevich; Andrei Petrovich Astrovko
Belgium	Maryse Wanlin; Patrick De Smet
Bosnia & Herzegovina	Zehra Dizdarevic; Hasan Zutic
Bulgaria	Vladimir Milanov
Croatia	Aleksandar Simunovic
Cyprus	Andreas Georghiou; Chrystalla Hadjianastassiou
Czech Republic	Jiří Wallenfels; Zdenka Novakova
Denmark	Peter Henrik Andersen; Charlotte Kjelsø
Estonia	Piret Viiklepp; Kai Kliiman
Finland	Petri Ruutu
France	Marie Claire Paty; Delphine Antoine
Georgia	Archil Salakaia; Ucha Nanava
Germany	Walter Haas; Bonita Brodhun
Greece	Georgia Spala; Rengina Vorou
Hungary	Janos Strausz; Gábor Kovács
Iceland	Thorsteinn Blöndal
Ireland	Joan O'Donnell
Israel	Daniel Chemtob; Yana Roshal
Italy	Maria Grazia Pompa; Stefania D'Amato
Kazakhstan	Shahimurat Shaimovich Ismailov; Klar Khasanovna Baimukhanova
Kyrgyzstan	Avtandil Shermamatovitch Alisherov; Elmira Djusupbekovna Abdrakhmanova
Latvia	Janis Leimans; Vija Riekstina
Lithuania	Edita Davidavičienė
Luxembourg	Pierre Weicherding; Norbert Charlé
Malta	Gianfranco Spiteri
Monaco	
Montenegro	Olivera Bojović; Božidarka Rakocevic
Netherlands	Vincent Kuyvenhoven; Connie Erkens
Norway	Brita Askeland Winje
Poland	Kazimierz Roszkowski; Maria Korzeniewska-Kosela
Portugal	António Fonseca Antunes
Republic of Moldova	Dmitrii Sain; Ana Ciobanu
Romania	Constantin Marica; Domnica Chiotan
Russian Federation	Mikhail I. Perelman; Yulia V. Mikhailova; Elena I. Skachkova
San Marino	
Serbia	Gordana Radosavljević-Ašić; Radmila Ćurčić; Rukije Mehmeti
Slovakia	Ivan Solovic; Jana Svecova
Slovenia	Damijan Eržen
Spain	Odorina Tello Anchuela; Elena Rodríguez Valín
Sweden	Victoria Romanus
Switzerland	Peter Helbling
Tajikistan	Sadulo Makhmadalievich Saidaliev; Firuza Teshaevna Sharipova
TFYR Macedonia	Stefan Talevski; Maja Zakoska
Turkey	Feyzullah Gümüslü; Ülgen Gullu
Turkmenistan	Babakuli Dzhumaev
Ukraine	Olga Stelmakh; Elena Pavlenko; Oksana Smetanina, Inna Motrich
United Kingdom	John Watson; Brian Smyth; Jim McMenamin; Roland Salmon; Michelle Kruijshaar; Eisin Shakir
Uzbekistan	Dilrabo Ulmasova; Gulnoz Uzakova; Nulifar Abdieva

This list shows the people named on the data collection form sent to WHO in 2008, not necessarily the current NTP manager. It is intended as an acknowledgement rather than a directory.

Table A3.1 **Methods and assumptions for estimation of TB incidence, prevalence and mortality, Europe**

	Reference year	Incidence est. based on	Trend	Source of estimates			Cfr ss+ HIV-		Duration ss+HIV-		Duration ss-HIV-	
				TB/HIV	MDR (new)	MDR (re-treat)	DOTS	non-DOTS	DOTS	non-DOTS	DOTS	non-DOTS
Albania	1997	Notif.	Country notifs, moving ave.	–	Model	Model	0.15	0.15	1	1.5	1	1.5
Andorra	1997	Notif.	Group, moving ave.	–	DRS	Model	0.12	0.12	0.75	1	0.75	1
Armenia	1999	Comparison	Group, moving ave.	Indirect	DRS	DRS	0.15	0.2	1	1.5	1	1.5
Austria	1997	Notif.	Group, moving ave.	Indirect	DRS	DRS	0.12	0.12	0.75	0.75	0.75	0.75
Azerbaijan	1999	Comparison	Group, moving ave.	Indirect	DRS	DRS	0.15	0.15	1	1.5	1	1.5
Belarus	1997	Notif.	Country notifs, moving ave.	Indirect	Model	Model	0.15	0.15	1	1.5	1	1.5
Belgium	1997	Notif.	Country notifs, moving ave.	Indirect	DRS	DRS	0.12	0.12	0.75	0.75	0.75	0.75
Bosnia & Herzegovina	1997	Notif.	Group, moving ave.	–	DRS	DRS	0.15	0.15	1	1.5	1	1.5
Bulgaria	1997	Notif.	Country notifs, moving ave.	Indirect	Model	Model	0.15	0.15	1	1.5	1	1.5
Croatia	1997	Notif.	Group, moving ave.	–	DRS	DRS	0.15	0.15	1	1.5	1	1.5
Cyprus	1997	ARI	Group, moving ave.	Routine	Model	Model	0.1	0.1	1	1.5	1	1.5
Czech Republic	1997	Notif.	Country notifs, moving ave.	Indirect	DRS	DRS	0.12	0.12	1	1	1	1
Denmark	1997	Notif.	Group, moving ave.	Indirect	DRS	DRS	0.12	0.12	0.75	0.75	0.75	0.75
Estonia	2002	Notif.	Country notifs, moving ave.	Indirect	DRS	DRS	0.15	0.15	1	1.5	1	1.5
Finland	1997	Notif.	Country notifs, moving ave.	Indirect	DRS	DRS	0.12	0.12	0.75	0.75	0.75	0.75
France	1997	Notif.	Group, moving ave.	Indirect	DRS	DRS	0.12	0.12	0.75	0.75	0.75	0.75
Georgia	1997	Notif.	Group, moving ave.	Sentinel	DRS	DRS	0.15	0.2	1	1.5	1	1.5
Germany	1997	Notif.	Country notifs, moving ave.	Indirect	DRS	DRS	0.12	0.12	0.75	0.75	0.75	0.75
Greece	1997	Notif.	Group, moving ave.	Indirect	Model	Model	0.12	0.12	0.75	0.75	0.75	0.75
Hungary	1999	Notif.	Country notifs, moving ave.	Indirect	Model	Model	0.15	0.15	1	1.5	1	1.5
Iceland	1997	Notif.	Country notifs, moving ave.	Indirect	DRS	DRS	0.12	0.12	0.75	0.75	0.75	0.75
Ireland	1999	Notif.	Country notifs, moving ave.	Indirect	DRS	DRS	0.12	0.12	0.75	0.75	0.75	0.75
Israel	2004	Notif.	Group, moving ave.	Routine	DRS	DRS	0.12	0.12	0.75	0.75	0.75	0.75
Italy	1997	Notif.	Group, moving ave.	Indirect	DRS	DRS	0.12	0.12	0.75	0.75	0.75	0.75
Kazakhstan	1999	Comparison	Country notifs, moving ave.	Indirect	DRS	DRS	0.15	0.15	1	1.5	1	1.5
Kyrgyzstan	1999	Comparison	Country notifs, moving ave.	Indirect	Model	Model	0.15	0.15	1	1.5	1	1.5
Latvia	1997	Notif.	Country notifs, moving ave.	Routine	DRS	DRS	0.15	0.15	1	1.5	1	1.5
Lithuania	1997	Notif.	Country notifs, moving ave.	Indirect	DRS	DRS	0.15	0.15	1	1.5	1	1.5
Luxembourg	1997	Notif.	Group, moving ave.	Indirect	DRS	Model	0.12	0.12	0.75	0.75	0.75	0.75
Malta	1997	Notif.	Group, moving ave.	Routine	DRS	Model	0.12	0.12	0.75	0.75	0.75	0.75
Monaco	2000	Notif.	Group, moving ave.	–	Model	Model	0.12	0.12	0.75	0.75	0.75	0.75
Montenegro	1997	Notif.	Group, moving ave.	–	Model	Model	0.15	0.15	1	1.5	1	1.5
Netherlands	1997	Notif.	Group, moving ave.	Indirect	DRS	DRS	0.12	0.12	0.75	0.75	0.75	0.75
Norway	1999	Notif.	Group, moving ave.	Indirect	DRS	DRS	0.12	0.12	0.75	0.75	0.75	0.75
Poland	1997	Notif.	Country notifs, moving ave.	Indirect	DRS	DRS	0.15	0.15	1	1.5	1	1.5
Portugal	1997	Notif.	Country notifs, moving ave.	Routine	DRS	DRS	0.12	0.12	0.75	0.75	0.75	0.75
Republic of Moldova	1999	Comparison	Group, moving ave.	Routine	DRS	DRS	0.15	0.15	1	1.5	1	1.5
Romania	1997	Notif.	Country notifs, moving ave.	Indirect	DRS	DRS	0.15	0.15	1	1.5	1	1.5
Russian Federation	1995	Notif.	Country notifs, moving ave.	Routine	DRS	DRS	0.15	0.2	1	1.5	1	1.5
San Marino	1997	Notif.	Group, moving ave.	–	Model	Model	0.12	0.12	0.75	0.75	0.75	0.75
Serbia	1997	Notif.	Group, moving ave.	Indirect	DRS	DRS	0.15	0.15	1	1.5	1	1.5
Slovakia	1997	Notif.	Country notifs, moving ave.	Routine	DRS	DRS	0.15	0.2	1	1.5	1	1.5
Slovenia	1997	Notif.	Country notifs, moving ave.	–	DRS	DRS	0.15	0.15	1	1.5	1	1.5
Spain	1997	Notif.	Group, moving ave.	Indirect	DRS	DRS	0.12	0.12	0.75	0.75	0.75	0.75
Sweden	1999	Notif.	Country notifs, moving ave.	Indirect	DRS	DRS	0.12	0.12	0.75	0.75	0.75	0.75
Switzerland	1997	Notif.	Country notifs, moving ave.	Indirect	DRS	DRS	0.12	0.12	0.75	0.75	0.75	0.75
Tajikistan	1997	Notif.	Country notifs, moving ave.	Indirect	Model	Model	0.15	0.15	1	1.5	1	1.5
TFYR Macedonia	1997	Notif.	Group, moving ave.	–	Model	Model	0.15	0.2	1	1.5	1	1.5
Turkey	1997	Notif.	Country notifs, moving ave.	–	Model	Model	0.15	0.15	1	1.5	1	1.5
Turkmenistan	1997	Notif.	Country notifs, moving ave.	–	DRS	DRS	0.15	0.15	1	1.5	1	1.5
Ukraine	1997	Notif.	Country notifs, moving ave.	Indirect	DRS	DRS	0.15	0.15	1	1.5	1	1.5
United Kingdom	1999	Notif.	Country notifs, moving ave.	Indirect	DRS	DRS	0.12	0.12	0.75	0.75	0.75	0.75
Uzbekistan	1997	Notif.	Country notifs, moving ave.	Indirect	DRS	DRS	0.15	0.15	1	1.5	1	1.5

– indicates no estimate; ARI, annual risk of infection; ave, average; C-ReC., capture re-capture; CDR, case detection rate; DRS, drug resistance survey; exp., exponential; HIV+, HIV-positive; HIV-, HIV-negative; Mort., mortality (vital registration); Notif(s)., notification(s); Prev., disease prevalence survey; ss+, sputum smear-positive; ss-, sputum smear-negative. See Annex 2 (methods) for details. Data can be downloaded from www.who.int/tb

Table A3.2 **Estimated burden of TB, Europe, 1990 and 2007**

	Incidence, 1990				Prevalence, 1990		TB mortality, 1990		Incidence, 2007								Prevalence, 2007				TB mortality, 2007				HIV prevalence in incident TB cases (%)	MDR, 2007			
	All forms*		Smear-positive*		All forms*		All forms*		All forms*		All forms HIV+		Smear-positive*		Smear-positive HIV+		All forms*		All forms HIV+		All forms*		All forms HIV+			Percentage of		Number among	
	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate		new	re-treat	all cases	smear-positive
Albania	819	25	369	11	1 375	42	141	4	538	17	–	–	242	8	–	–	709	22	–	–	98	3	–	–	–	1.5	10	12	8
Andorra	19	36	8	16	21	39	2	4	14	19	–	–	6	9	–	–	14	19	–	–	2	2	–	–	–	< 0.05	10	< 1	< 1
Armenia	1 173	33	528	15	1 831	52	191	5	2 171	72	63	2	971	32	22	< 1	2 428	81	31	1	313	10	12	< 1	2.9	9.4	43	486	373
Austria	1 801	23	810	10	1 400	18	180	2	1 035	12	32	< 1	462	6	11	< 1	796	10	16	< 1	103	1	3	< 1	3.1	1.9	13	25	14
Azerbaijan	2 546	35	1 146	16	4 154	58	365	5	6 530	77	219	3	2 916	34	77	< 1	7 320	86	109	1	882	10	39	< 1	3.3	22	56	3 916	3 109
Belarus	3 948	38	1 776	17	6 393	62	526	5	5 910	61	209	2	2 639	27	73	< 1	6 706	69	104	1	799	8	38	< 1	3.5	10	44	1 101	758
Belgium	1 997	20	896	9	1 614	16	208	2	1 235	12	46	< 1	551	5	16	< 1	989	9	23	< 1	129	1	5	< 1	3.7	1.2	7.3	21	13
Bosnia & Herzegovina	4 029	94	1 813	42	6 893	160	649	15	2 012	51	–	–	905	23	–	–	2 168	55	–	–	293	7	–	–	–	0.4	6.6	18	14
Bulgaria	2 353	27	1 059	12	3 812	43	313	4	2 962	39	54	< 1	1 328	17	19	< 1	3 130	41	27	< 1	398	5	9	< 1	1.8	9.4	37	371	217
Croatia	3 326	74	1 497	33	5 690	126	535	12	1 834	40	–	–	825	18	–	–	2 443	54	–	–	293	6	–	–	–	0.5	4.9	19	13
Cyprus	63	9	28	4	96	14	6	< 1	42	5	–	–	19	2	–	–	49	6	–	–	4	< 1	–	–	–	1.1	10	< 1	< 1
Czech Republic	2 143	21	964	9	2 238	22	242	2	893	9	5	< 1	401	4	2	< 1	945	9	2	< 1	103	1	< 1	< 1	0.5	1.2	30	26	20
Denmark	779	15	350	7	630	12	81	2	438	8	14	< 1	196	4	5	< 1	352	6	7	< 1	46	< 1	2	< 1	3.1	1.6	< 0.05	7	3
Estonia	500	32	225	14	791	50	65	4	509	38	84	6	221	17	29	2	526	39	42	3	81	6	18	1	17	13	52	123	85
Finland	874	18	393	8	680	14	87	2	313	6	5	< 1	140	3	2	< 1	242	5	3	< 1	31	< 1	< 1	< 1	1.6	1.0	4.5	4	2
France	14 810	26	6 641	12	11 959	21	1 542	3	8 548	14	484	< 1	3 798	6	170	< 1	6 794	11	242	< 1	894	1	57	< 1	5.7	1.1	7.1	138	87
Georgia	2 106	39	948	17	2 783	51	361	7	3 703	84	128	3	1 654	38	45	1	3 640	83	64	1	408	9	19	< 1	3.4	6.8	27	728	590
Germany	15 522	20	6 971	9	12 040	15	1 552	2	4 910	6	114	< 1	2 198	3	40	< 1	3 789	5	57	< 1	491	< 1	11	< 1	2.3	1.8	12	150	100
Greece	3 404	33	1 529	15	3 083	30	426	4	1 984	18	69	< 1	886	8	24	< 1	1 776	16	34	< 1	251	2	12	< 1	3.5	1.1	11	46	34
Hungary	4 254	41	1 914	18	6 990	67	575	6	1 672	17	20	< 1	750	7	7	< 1	1 908	19	10	< 1	224	2	4	< 1	1.2	1.4	19	91	78
Iceland	15	6	7	3	12	5	2	< 1	11	4	< 1	< 1	5	2	< 1	< 1	8	3	< 1	< 1	1	< 1	< 1	< 1	3.2	< 0.05	< 0.05	< 1	< 1
Ireland	861	24	387	11	670	19	86	2	567	13	18	< 1	253	6	6	< 1	455	11	9	< 1	59	1	2	< 1	3.2	0.5	10	8	7
Israel	641	14	287	6	496	11	64	1	522	8	24	< 1	233	3	8	< 1	417	6	12	< 1	55	< 1	3	< 1	4.5	5.7	< 0.05	30	13
Italy	7 864	14	3 493	6	6 200	11	888	2	4 336	7	282	< 1	1 923	3	99	< 1	3 688	6	141	< 1	532	< 1	43	< 1	6.5	1.6	18	274	235
Kazakhstan	9 647	58	4 341	26	15 627	95	1 284	8	19 894	129	563	4	8 896	58	197	1	21 485	139	282	2	2 680	17	100	< 1	2.8	14	56	11 102	9 540
Kyrgyzstan	2 412	55	1 085	25	3 934	90	351	8	6 451	121	186	3	2 884	54	65	1	7 147	134	93	2	949	18	35	< 1	2.9	13	41	1 290	813
Latvia	916	34	412	15	1 480	56	118	4	1 208	53	62	3	537	24	22	< 1	1 263	55	31	1	179	8	12	< 1	5.2	11	36	202	129
Lithuania	1 472	40	663	18	2 352	64	160	4	2 305	68	53	2	1 032	30	18	< 1	2 353	69	26	< 1	295	9	9	< 1	2.3	10	48	464	339
Luxembourg	88	23	39	10	71	19	9	2	57	12	2	< 1	25	5	< 1	< 1	44	9	< 1	< 1	6	1	< 1	< 1	3.4	< 0.05	11	< 1	< 1
Malta	41	11	18	5	35	10	5	1	24	6	2	< 1	11	3	< 1	< 1	19	5	< 1	< 1	3	< 1	< 1	< 1	7.4	< 0.05	10	< 1	< 1
Monaco	1	4	< 1	2	1	3	< 1	< 1	< 1	2	–	–	< 1	1	–	–	< 1	2	–	–	< 1	< 1	–	–	–	–	–	–	–
Montenegro	–	–	–	–	–	–	–	–	193	32	–	–	87	15	–	–	295	49	–	–	26	4	–	–	–	–	–	–	–
Netherlands	2 115	14	949	6	1 638	11	212	1	1 234	8	36	< 1	552	3	13	< 1	950	6	18	< 1	123	< 1	3	< 1	2.9	0.7	3.3	10	6
Norway	443	10	199	5	359	8	46	1	261	6	6	< 1	117	2	2	< 1	201	4	3	< 1	26	< 1	< 1	< 1	2.3	1.6	< 0.05	4	2
Poland	19 858	52	8 935	23	33 462	88	2 886	8	9 584	25	177	< 1	4 295	11	62	< 1	10 697	28	88	< 1	1 319	3	34	< 1	1.8	0.3	8.2	133	117
Portugal	6 735	67	2 984	30	5 111	51	672	7	3 149	30	625	6	1 355	13	219	2	2 418	23	312	3	350	3	81	< 1	20	0.9	9.3	59	44
Republic of Moldova	2 832	65	1 274	29	4 588	105	377	9	5 348	141	198	5	2 387	63	69	2	5 740	151	99	3	722	19	35	< 1	3.7	19	51	2 231	1 656
Romania	17 068	74	7 678	33	27 416	118	1 955	8	24 635	115	598	3	11 026	51	209	< 1	27 437	128	299	1	3 516	16	129	< 1	2.4	2.8	11	1 555	1 171
Russian Federation	66 955	45	30 130	20	102 085	69	10 852	7	157 321	110	25 715	18	68 223	48	9 000	6	163 861	115	12 857	9	25 355	18	5 105	4	16	13	49	42 969	31 397
San Marino	3	12	1	5	2	9	< 1	1	2	6	–	–	< 1	3	–	–	2	5	–	–	< 1	< 1	–	–	–	–	–	–	–
Serbia	6 010	59	2 705	27	10 239	101	976	10	3 190	32	74	< 1	1 428	14	26	< 1	4 004	41	37	< 1	479	5	20	< 1	2.3	0.4	4.1	26	19
Slovakia	2 085	40	938	18	2 880	55	347	7	896	17	–	–	403	7	–	–	1 098	20	–	–	146	3	–	–	–	1.6	7.1	25	17
Slovenia	824	43	371	19	1 271	66	99	5	259	13	–	–	116	6	–	–	304	15	–	–	37	2	–	–	–	< 0.05	3.6	< 1	< 1
Spain	21 644	56	9 616	25	17 199	44	2 265	6	13 103	30	1 044	2	5 792	13	365	< 1	10 320	23	522	1	1 375	3	122	< 1	8.0	0.1	4.3	65	56
Sweden	594	7	266	3	460	5	59	< 1	544	6	13	< 1	244	3	5	< 1	420	5	7	< 1	54	< 1	1	< 1	2.5	0.5	12	6	4
Switzerland	1 253	18	557	8	956	14	125	2	460	6	39	< 1	203	3	14	< 1	347	5	20	< 1	46	< 1	4	< 1	8.6	0.6	6.7	7	6
Tajikistan	5 927	112	2 667	50	10 247	193	1 084	20	15 542	231	614	9	6 933	103	215	3	21 680	322	307	5	3 066	46	212	3	4.0	16	41	4 688	3 286
TFYR Macedonia	1 023	54	460	24	1 759	92	216	11	597	29	–	–	269	13	–	–	672	33	–	–	103	5	–	–	–	1.6	10	20	15
Turkey	28 324	49	12 746	22	47 535	83	4 872	8	22 136	30	–	–	9 961	13	–	–	25 189	34	–	–	3 789	5	–	–	–	1.4	10	563	398
Turkmenistan	2 356	64	1 060	29	3 843	105	343	9	3 399	68	–	–	1 530	31	–	–	3 732	75	–	–	460	9	–	–	–	3.8	18	177	106
Ukraine	21 320	41	9 594	19	34 704	67	2 879	6	46 916	102	9 491	21	20 163	44	3 322	7	47 008	102	4 745	10	6 744	15	1 726	4	20	16	44	9 835	5 568
United Kingdom	6 722	12	3 022	5	5 221	9	672	1	9 308	15	311	< 1	4 158	7	109	< 1	7 157	12	155	< 1	930	2	30	< 1	3.3	0.7	2.6	74	39
Uzbekistan	14 026	68	6 312	31	23 301	114	2 012	10	30 813	113	646	2	13 801	50	226	< 1	38 445	140	323	1	4 497	16	159	< 1	2.1	15	60	9 450	6 936
EUR	**318 540**	**37**	**143 062**	**17**	**439 626**	**52**	**43 963**	**5**	**431 518**	**49**	**42 322**	**5**	**189 951**	**21**	**14 813**	**2**	**455 580**	**51**	**21 161**	**2**	**63 765**	**7**	**8 096**	**< 1**	**9.8**	**10**	**43**	**92 554**	**67 440**

– Indicates no estimate.
* Incidence, prevalence and mortality estimates include patients with HIV. Estimates labelled "HIV+" are estimates of HIV+ TB cases in all people. Estimates for all years are re-calculated as new information becomes available and techniques are refined, so they may differ from those published previously. See Explanatory notes for further details.
Data can be downloaded from www.who.int/tb

Table A3.3 **Estimated incidence of TB (all forms) in all people, Europe, 1990–2007**

	Number of cases																	
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Albania	819	803	815	847	839	861	840	862	860	839	781	724	699	696	660	629	584	538
Andorra	19	18	18	18	18	18	17	17	16	15	15	14	15	14	14	14	14	14
Armenia	1 173	1 114	1 152	1 232	1 338	1 501	1 678	1 815	1 956	2 067	2 178	2 209	2 190	2 169	2 157	2 167	2 168	2 171
Austria	1 801	1 712	1 643	1 554	1 501	1 438	1 395	1 353	1 299	1 223	1 172	1 133	1 126	1 086	1 069	1 058	1 047	1 035
Azerbaijan	2 546	2 480	2 653	2 951	3 332	3 865	4 438	4 903	5 371	5 753	6 137	6 295	6 303	6 295	6 313	6 395	6 460	6 530
Belarus	3 948	3 461	3 873	4 100	5 018	5 570	6 186	6 673	7 329	7 633	7 385	6 558	5 924	5 902	5 965	5 978	5 944	5 910
Belgium	1 997	1 864	1 832	1 857	1 877	1 811	1 701	1 625	1 530	1 536	1 586	1 623	1 518	1 436	1 378	1 384	1 310	1 235
Bosnia & Herzegovina	4 029	3 850	3 674	3 417	3 143	2 886	2 810	2 815	2 821	2 624	2 380	2 234	2 187	2 129	2 081	2 043	2 028	2 012
Bulgaria	2 353	2 616	2 929	3 130	3 178	3 143	3 213	3 501	3 637	3 606	3 525	3 460	3 367	3 093	3 059	3 081	3 021	2 962
Croatia	3 326	3 305	3 347	3 336	3 260	3 101	3 026	2 956	2 840	2 534	2 229	2 057	1 999	1 945	1 904	1 870	1 853	1 834
Cyprus	63	60	58	55	54	52	51	50	49	47	45	44	44	43	43	43	42	42
Czech Republic	2 143	2 172	2 146	2 103	2 048	2 087	2 041	2 030	1 898	1 746	1 560	1 397	1 284	1 189	1 122	1 065	979	893
Denmark	779	737	703	661	636	608	590	574	553	523	502	485	482	464	456	450	444	438
Estonia	500	492	536	623	709	769	817	895	923	942	897	844	751	683	627	573	541	509
Finland	874	780	701	625	611	647	654	643	615	599	540	500	453	404	365	326	320	313
France	14 810	14 048	13 431	12 656	12 189	11 651	11 306	10 981	10 563	9 977	9 580	9 280	9 242	8 926	8 799	8 720	8 636	8 548
Georgia	2 106	2 001	2 074	2 227	2 427	2 727	3 047	3 288	3 529	3 710	3 887	3 919	3 861	3 797	3 751	3 743	3 722	3 703
Germany	15 522	15 065	14 889	14 720	14 039	13 201	12 551	11 922	11 263	10 514	9 272	8 187	7 282	6 943	6 446	5 909	5 411	4 910
Greece	3 404	3 238	3 108	2 944	2 850	2 737	2 668	2 601	2 509	2 374	2 280	2 204	2 187	2 103	2 064	2 037	2 010	1 984
Hungary	4 254	4 328	4 569	4 765	4 912	4 988	5 017	4 885	4 548	4 096	3 681	3 367	3 149	2 889	2 536	2 220	1 945	1 672
Iceland	15	15	13	13	12	12	10	11	11	12	10	10	8	7	8	10	10	11
Ireland	861	831	819	777	712	639	582	567	576	563	549	514	500	494	499	526	546	567
Israel	641	624	615	598	595	585	582	579	569	548	535	527	532	520	519	520	521	522
Italy	7 864	7 431	7 080	6 652	6 389	6 092	5 899	5 718	5 491	5 176	4 960	4 793	4 761	4 586	4 507	4 454	4 396	4 336
Kazakhstan	9 647	8 988	8 836	8 750	8 858	9 834	11 374	13 932	16 953	19 594	21 110	21 813	22 121	22 210	21 725	20 850	20 374	19 894
Kyrgyzstan	2 412	2 568	2 610	2 680	2 957	3 532	4 382	5 186	5 983	6 341	6 672	6 753	6 743	6 551	6 449	6 449	6 449	6 451
Latvia	916	949	978	1 041	1 240	1 498	1 791	2 007	2 050	2 044	1 983	1 952	1 852	1 710	1 577	1 443	1 325	1 208
Lithuania	1 472	1 545	1 687	1 880	2 134	2 372	2 637	2 854	2 916	2 826	2 687	2 558	2 535	2 347	2 247	2 175	2 241	2 305
Luxembourg	88	84	81	77	75	72	71	69	67	64	62	61	60	59	58	57	57	57
Malta	41	39	37	35	34	33	32	31	30	28	27	26	26	25	25	25	25	24
Monaco	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Montenegro	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	201	196	193
Netherlands	2 115	2 009	1 923	1 815	1 751	1 677	1 632	1 590	1 534	1 453	1 397	1 354	1 348	1 300	1 279	1 265	1 250	1 234
Norway	443	420	401	378	365	349	339	331	319	302	291	282	281	271	268	265	263	261
Poland	19 858	20 008	20 290	20 356	20 117	19 519	18 424	17 342	16 042	14 805	13 524	12 671	12 162	11 570	10 811	10 136	9 860	9 584
Portugal	6 735	6 472	6 198	6 069	5 944	5 873	5 692	5 578	5 347	5 033	4 696	4 617	4 488	4 232	3 847	3 617	3 385	3 149
Republic of Moldova	2 832	2 723	2 870	3 141	3 486	3 971	4 474	4 847	5 203	5 461	5 711	5 746	5 646	5 537	5 453	5 426	5 384	5 348
Romania	17 068	18 326	19 833	22 007	23 901	25 309	26 217	27 133	27 841	29 152	30 190	31 528	31 841	31 835	30 493	29 006	26 810	24 635
Russian Federation	66 955	62 912	68 186	76 507	89 486	108 860	128 565	139 131	148 651	157 465	166 211	163 951	157 162	152 646	152 278	152 537	154 940	157 321
San Marino	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Serbia	6 010	6 004	6 114	6 130	6 028	5 776	5 685	5 605	5 434	4 876	4 294	3 946	3 803	3 658	3 546	3 256	3 220	3 190
Slovakia	2 085	2 191	2 352	2 416	2 329	2 194	1 982	1 864	1 680	1 549	1 413	1 356	1 308	1 161	1 040	934	915	896
Slovenia	824	773	743	720	675	641	624	593	538	493	457	423	386	343	315	288	273	259
Spain	21 644	20 469	19 516	18 346	17 633	16 827	16 305	15 820	15 219	14 405	13 896	13 563	13 640	13 315	13 255	13 242	13 189	13 103
Sweden	594	599	620	626	610	567	539	497	490	476	458	421	410	418	476	512	528	544
Switzerland	1 253	1 212	1 088	1 013	957	899	835	806	803	731	656	596	600	596	567	534	497	460
Tajikistan	5 927	5 148	3 668	2 651	2 918	3 742	4 777	5 113	5 862	6 385	7 250	8 477	9 697	10 536	11 683	12 591	14 042	15 542
TFYR Macedonia	1 023	1 017	1 027	1 019	995	949	934	924	901	814	723	671	653	634	620	608	603	597
Turkey	28 324	27 858	27 944	27 463	26 546	24 902	25 543	26 463	27 217	24 401	21 327	19 798	19 751	19 859	20 478	21 109	21 619	22 136
Turkmenistan	2 356	2 328	2 470	2 472	2 436	2 198	2 558	3 211	3 911	4 118	4 156	4 013	3 921	3 727	3 563	3 373	3 387	3 399
Ukraine	21 320	20 503	21 904	23 469	24 797	26 181	29 280	31 788	35 563	37 396	40 989	43 915	45 529	46 172	45 962	47 649	47 278	46 916
United Kingdom	6 722	6 852	7 065	7 106	7 019	6 928	6 987	6 987	6 966	6 915	6 860	7 122	7 190	7 567	8 043	8 698	9 003	9 308
Uzbekistan	14 026	13 412	13 582	16 147	16 440	17 491	16 702	18 941	20 448	21 589	22 928	25 532	27 898	29 303	29 737	31 240	31 033	30 813
EUR	**318 540**	**308 459**	**314 704**	**326 181**	**341 420**	**363 185**	**389 505**	**409 910**	**428 724**	**437 374**	**445 657**	**445 527**	**440 916**	**435 397**	**432 139**	**432 704**	**432 102**	**431 518**

	Rate (per 100 000 population)																	
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Albania	25	24	25	26	26	27	27	28	28	27	25	23	23	22	21	20	18	17
Andorra	36	34	32	30	29	27	26	26	25	23	22	21	21	20	20	19	19	19
Armenia	33	32	33	37	41	47	53	58	63	67	71	72	72	71	71	72	72	72
Austria	23	22	21	20	19	18	17	17	16	15	14	14	14	13	13	13	13	12
Azerbaijan	35	34	36	39	43	50	56	62	67	71	75	77	77	76	76	77	77	77
Belarus	38	34	38	40	49	54	60	65	72	76	73	66	60	60	61	61	61	61
Belgium	20	19	18	19	19	18	17	16	15	15	16	16	15	14	13	13	13	12
Bosnia & Herzegovina	94	92	93	92	89	84	83	81	79	71	63	58	56	55	53	52	52	51
Bulgaria	27	30	34	37	38	38	39	43	45	45	44	44	43	39	39	40	39	39
Croatia	74	73	73	72	70	66	65	64	62	56	49	46	44	43	42	41	41	40
Cyprus	9	9	8	8	7	7	7	7	6	6	6	6	5	5	5	5	5	5
Czech Republic	21	21	21	20	20	20	20	20	19	17	15	14	13	12	11	10	10	9
Denmark	15	14	14	13	12	12	11	11	10	10	9	9	9	9	8	8	8	8
Estonia	32	32	35	42	48	53	58	64	66	68	66	62	55	50	46	43	40	38
Finland	18	16	14	12	12	13	13	13	12	12	10	10	9	8	7	6	6	6
France	26	25	23	22	21	20	19	19	18	17	16	16	15	15	15	14	14	14
Georgia	39	37	39	43	47	54	62	67	73	78	82	84	84	83	83	84	84	84
Germany	20	19	19	18	17	16	15	15	14	13	11	10	9	8	8	7	7	6
Greece	33	32	30	28	27	26	25	24	23	22	21	20	20	19	19	18	18	18
Hungary	41	42	44	46	48	48	49	47	44	40	36	33	31	28	25	22	19	17
Iceland	6	6	5	5	5	5	4	4	4	4	4	3	3	2	3	3	4	4
Ireland	24	24	23	22	20	18	16	15	16	15	14	13	13	12	12	13	13	13
Israel	14	13	13	12	11	11	11	10	10	9	9	8	8	8	8	8	8	8
Italy	14	13	12	12	11	11	10	10	10	9	9	8	8	8	8	8	7	7
Kazakhstan	58	54	54	54	55	62	72	90	111	130	141	146	148	148	144	137	133	129
Kyrgyzstan	55	58	58	59	65	77	94	110	125	130	135	135	133	128	125	124	123	121
Latvia	34	36	37	41	49	60	73	82	85	85	83	83	79	73	68	63	58	53
Lithuania	40	42	46	51	58	65	73	80	82	80	77	73	73	68	65	63	66	68
Luxembourg	23	22	21	19	19	18	17	16	16	15	14	14	14	13	13	13	12	12
Malta	11	11	10	9	9	9	8	8	8	7	7	7	7	6	6	6	6	6
Monaco	4	4	4	4	4	3	3	3	3	3	3	3	3	2	2	2	2	2
Montenegro	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	33	33	32
Netherlands	14	13	13	12	11	11	10	10	10	9	9	8	8	8	8	8	8	8
Norway	10	10	9	9	8	8	8	7	7	7	6	6	6	6	6	6	6	6
Poland	52	52	53	53	52	51	48	45	42	38	35	33	32	30	28	27	26	25
Portugal	67	65	62	61	59	59	57	55	53	49	46	45	43	41	37	34	32	30
Republic of Moldova	65	62	65	71	79	91	103	113	122	130	138	141	140	139	139	140	140	141
Romania	74	79	86	96	105	112	116	121	125	131	136	143	145	146	140	134	125	115
Russian Federation	45	42	46	51	60	73	86	94	100	106	113	112	108	105	105	106	108	110
San Marino	12	11	11	10	9	9	9	8	8	8	7	7	7	7	7	6	6	6
Serbia	59	58	59	58	56	53	52	51	50	45	40	37	36	35	34	33	33	32
Slovakia	40	41	44	45	44	41	37	35	31	29	26	25	24	22	19	17	17	17
Slovenia	43	40	38	37	34	33	32	30	27	25	23	21	19	17	16	14	14	13
Spain	56	53	50	47	45	43	41	40	38	36	35	33	33	32	31	31	30	30
Sweden	7	7	7	7	7	6	6	6	6	5	5	5	5	5	5	5	6	6
Switzerland	18	18	16	14	14	13	12	11	11	10	9	8	8	8	8	7	7	6
Tajikistan	112	95	66	47	51	65	82	86	97	105	117	136	153	165	181	192	211	231
TFYR Macedonia	54	53	53	52	51	48	47	47	45	41	36	33	32	31	31	30	30	29
Turkey	49	48	47	45	43	40	40	41	41	36	31	29	28	28	28	29	29	30
Turkmenistan	64	62	64	62	59	52	60	74	89	93	92	88	85	79	75	70	69	68
Ukraine	41	40	43	46	48	51	58	63	71	76	84	91	95	97	97	102	102	102
United Kingdom	12	12	12	12	12	12	12	12	12	12	12	12	12	13	13	14	15	15
Uzbekistan	68	64	63	73	73	76	72	80	85	89	93	102	110	113	113	117	115	113
EUR	**37**	**36**	**37**	**38**	**40**	**42**	**45**	**47**	**49**	**50**	**51**	**51**	**50**	**49**	**49**	**49**	**49**	**49**

Estimates for all years are re-calculated as new information becomes available and techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.4 **Estimated incidence, prevalence and mortality rates (per 100 000 population), Europe, 2000–2007**

	Incidence of HIV+ TB cases								Prevalence of TB (all forms)								Mortality (excluding HIV+)								Mortality HIV+							
	2000	2001	2002	2003	2004	2005	2006	2007	2000	2001	2002	2003	2004	2005	2006	2007	2000	2001	2002	2003	2004	2005	2006	2007	2000	2001	2002	2003	2004	2005	2006	2007
Albania	–	–	–	–	–	–	–	–	40	34	32	32	29	29	26	22	4	4	4	4	4	4	3	3	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Andorra	–	–	–	–	–	–	–	–	20	20	21	18	19	18	17	19	2	3	3	2	2	2	2	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Armenia	1	2	2	2	2	2	2	2	94	99	97	91	85	79	79	81	11	12	12	11	10	10	10	10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Austria	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	11	11	11	10	10	10	10	10	1	1	1	1	1	1	1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Azerbaijan	< 1	< 1	< 1	< 1	1	2	2	3	113	117	99	109	90	85	86	86	10	10	10	11	10	10	10	10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Belarus	2	2	2	2	2	2	2	2	110	100	89	68	68	68	69	69	10	9	8	8	8	8	8	8	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Belgium	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	12	13	12	11	11	11	10	9	2	2	1	1	1	1	1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Bosnia & Herzegovina	–	–	–	–	–	–	–	–	70	63	66	63	55	58	58	55	9	8	8	8	7	8	8	7	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Bulgaria	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	64	63	52	42	40	41	40	41	5	6	6	5	5	5	5	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Croatia	–	–	–	–	–	–	–	–	76	73	69	68	67	65	65	54	7	7	7	7	7	7	6	6	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cyprus	–	–	–	–	–	–	–	–	9	8	7	6	6	6	6	6	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Czech Republic	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	16	14	13	12	11	11	10	9	2	2	1	1	1	1	1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Denmark	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	7	7	7	7	7	6	7	6	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Estonia	2	4	6	7	7	7	7	6	72	68	62	56	50	46	44	39	9	8	8	7	6	5	5	5	< 1	< 1	1	2	2	2	2	1
Finland	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	8	7	7	6	6	5	5	5	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
France	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	13	12	12	12	12	11	11	11	2	2	2	1	1	1	1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Georgia	< 1	< 1	< 1	< 1	1	2	2	3	98	95	95	94	90	86	83	83	14	14	14	13	13	11	9	9	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Germany	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	9	8	7	6	6	6	5	5	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Greece	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	19	18	18	17	17	16	16	16	3	2	2	2	2	2	2	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Hungary	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	43	39	36	33	29	26	22	19	5	4	4	4	3	3	3	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Iceland	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	3	3	2	2	2	3	3	3	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Ireland	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	12	11	10	10	10	10	10	11	1	1	1	1	1	1	1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Israel	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	7	7	6	6	6	6	6	6	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Italy	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	7	7	7	6	6	6	6	6	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Kazakhstan	< 1	1	2	2	3	3	3	4	141	148	150	155	152	147	144	139	15	17	17	19	19	18	17	17	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Kyrgyzstan	< 1	1	2	2	2	3	3	3	156	169	153	145	139	136	135	134	20	20	19	18	18	18	17	17	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Latvia	1	2	2	3	3	3	3	3	91	89	85	78	72	66	61	55	12	12	11	10	9	9	8	7	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithuania	< 1	1	1	1	1	1	1	2	115	96	83	72	72	66	65	69	10	10	10	9	9	8	7	8	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Luxembourg	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	11	11	11	10	10	10	10	9	1	1	1	1	1	1	1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Malta	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	6	6	5	5	5	5	5	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Monaco	–	–	–	–	–	–	–	–	2	2	2	2	2	2	2	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Montenegro	–	–	–	–	–	–	–	–	–	–	–	–	–	52	50	49	–	–	–	–	–	5	4	4	–	–	–	–	–	< 1	< 1	< 1
Netherlands	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	7	7	6	6	6	6	6	6	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Norway	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	5	5	5	5	4	4	4	4	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Poland	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	53	50	35	34	33	31	29	28	5	4	4	4	4	4	4	3	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Portugal	8	8	8	8	7	7	6	6	36	34	33	32	29	27	24	23	4	3	3	4	3	3	3	3	1	1	< 1	1	< 1	< 1	< 1	< 1
Republic of Moldova	< 1	< 1	< 1	1	2	3	4	5	215	174	211	176	152	151	151	151	20	20	20	20	18	18	18	18	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Romania	3	3	4	4	4	3	3	3	197	206	180	185	178	148	138	128	18	19	19	19	18	18	17	16	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Russian Federation	5	8	11	14	16	17	17	18	164	158	148	140	135	121	117	115	19	18	17	16	15	14	14	14	2	3	4	4	5	4	4	4
San Marino	–	–	–	–	–	–	–	–	6	6	6	5	5	5	5	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Serbia	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	60	49	48	44	44	35	35	41	6	5	5	5	5	4	4	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Slovakia	–	–	–	–	–	–	–	–	32	30	29	26	25	21	20	20	4	4	4	3	3	3	3	3	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Slovenia	–	–	–	–	–	–	–	–	27	25	22	21	19	16	16	15	3	3	3	2	2	2	2	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Spain	3	3	3	2	2	2	2	2	27	26	26	25	24	24	24	23	3	3	3	3	3	3	3	3	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Sweden	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	4	4	4	4	4	4	4	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Switzerland	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	7	6	6	6	6	5	5	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Tajikistan	–	–	–	–	–	–	–	–	56	39	40	37	34	34	34	33	7	6	6	6	5	5	5	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
TFYR Macedonia	< 1	1	2	3	4	6	7	9	191	221	248	256	277	282	301	322	22	26	29	30	34	36	39	42	< 1	< 1	< 1	1	2	2	3	3
Turkey	–	–	–	–	–	–	–	–	49	45	44	43	44	44	32	34	5	5	5	5	5	5	5	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Turkmenistan	–	–	–	–	–	–	–	–	130	115	110	103	98	91	85	75	13	13	12	12	11	10	10	9	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Ukraine	8	9	12	14	16	19	20	21	120	128	133	135	132	113	99	102	10	11	11	11	11	11	11	11	2	2	3	4	4	3	3	4
United Kingdom	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	9	9	9	10	10	11	11	12	1	1	1	1	1	1	1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Uzbekistan	< 1	< 1	< 1	< 1	1	2	2	2	139	148	144	152	149	144	134	140	12	14	15	15	16	16	15	16	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
EUR	**2**	**2**	**3**	**4**	**4**	**4**	**5**	**5**	**68**	**67**	**63**	**62**	**60**	**55**	**52**	**51**	**7**	**7**	**7**	**7**	**7**	**6**	**6**	**6**	**< 1**	**< 1**	**< 1**	**1**	**1**	**< 1**	**< 1**	**< 1**

Rates are per 100 000 population (total country population, including HIV-positive and HIV-negative people). Estimates for all years are re-calculated as new information becomes available and techniques are refined, so they may differ from those published previously. Data (including for years 1990 to 1999) can be downloaded from www.who.int/tb

Table A3.5 **Case notifications and case detection rates, DOTS and non-DOTS combined, Europe, 2007**

		Notified TB cases, DOTS and non-DOTS combined														Estimated incidence and case detection rates				Proportions			
					New pulmonary			New extra-	Other	Re-treatment cases					New pulm.	Estimated incidence		Case detection rate		ss+	ss+	Extrapulm.	Re-treat.
	Population	All notified	New and relapse		ss+		ss- / unk.	pulmonary	new	Relapse	After failure	After default	Other re-treat.	Other	lab. confirm.	all forms	ss+	all new	new ss+	(% of	(% of	(% of	(% of
	thousands	number	number	rate	number	rate	number	number	number	number	number	number	number	number	number	number	number	%	%	pulm.)	new+relapse)	new+relapse)	new+re-treat.)
Albania	3 190	447	438	14	165	5	105	152		16	0	2	7	0	179	538	242	78	68	61	38	35	6
Andorra	75	6	5	7	2	3	1	2		0	0	0	1	0	3	14	6	35	32	67	40	40	17
Armenia	3 002	2 129	1 682	56	497	17	699	337		149	62	76	309	0	497	2 171	971	71	51	42	30	20	28
Austria	8 361	874	811	10	189	2	486	136		0			63	0	441	1 035	462	78	41	28	23	17	7
Azerbaijan	8 467	7 347	5 521	65	1 356	16	2 338	750		1 077			1 826	0	1 356	6 530	2 916	68	46	37	25	14	40
Belarus	9 689	5 756	5 351	55	1 051	11	3 486	335		479			405	0	1 988	5 910	2 639	82	40	23	20	6	15
Belgium	10 457	1 028	955	9	322	3	367	266		0			73	0	583	1 235	551	77	58	47	34	28	7
Bosnia & Herzegovina	3 935	2 400	2 373	60	737	19	1 252	228		156	0	0	27	0	1 266	2 012	905	110	81	37	31	10	8
Bulgaria	7 639	3 052	2 848	37	1 080	14	1 010	653		105	28	44	132	0	1 314	2 962	1 328	93	81	52	38	23	10
Croatia	4 555	982	951	21	382	8	394	108		67			31	0	575	1 834	825	48	46	49	40	11	10
Cyprus	855	42	41	5	8	1	27	6		0		1	0	0	28	42	19	97	42	23	20	15	2
Czech Republic	10 186	871	790	8	267	3	407	116		0			81	0	478	893	401	88	67	40	34	15	9
Denmark	5 442	391	355	7	135	2	137	83		0			36	0	216	438	196	81	69	50	38	23	9
Estonia	1 335	487	456	34	168	13	209	32		47	2	18	11	0	303	509	221	80	76	45	37	7	16
Finland	5 277	313	300	6	85	2	112	102		1			13	0	158	313	140	96	61	43	28	34	4
France	61 647	5 588	5 314	9	1 921	3	1 856	1 289		248			137	137	2 933	8 548	3 798	59	51	51	36	24	7
Georgia	4 395	5 912	4 310	98	1 867	42	964	1 234		245	231	169	1 200	2	1 979	3 703	1 654	110	113	66	43	29	31
Germany	82 599	5 067	4 609	6	1 183	1	2 326	977		123	22	72	316	48	2 725	4 910	2 198	91	54	34	26	21	11
Greece	11 147	659	593	5	257	2	229	81		26	8	15	21	22	349	1 984	886	29	29	53	43	14	11
Hungary	10 030	1 752	1 540	15	381	4	957	86		116		44	168	0	653	1 672	750	85	51	28	25	6	19
Iceland	301	14	12	4	2	1	5	5		0		2	0	0	7	11	5	111	42	29	17	42	14
Ireland	4 301	478	425	10	135	3	171	111		8			43	10	212	567	253	74	53	44	32	26	11
Israel	6 928	397	392	6	143	2	163	80		6	1	2	2	0	227	522	233	74	61	47	36	20	3
Italy	58 877	4 527	2 695	5	979	2	1 100	616		0			1 772	60	1 360	4 336	1 923	62	51	47	36	23	40
Kazakhstan	15 422	40 279	24 777	161	6 195	40	12 056	3 306		3 220	2 408	1 612	11 482	0	7 184	19 894	8 896	108	70	34	25	13	46
Kyrgyzstan	5 317	6 707	6 098	115	1 720	32	2 220	1 727		431			609	0	1 720	6 451	2 884	88	60	44	28	28	16
Latvia	2 277	1 255	1 227	54	478	21	464	137		148	3	21	4	0	788	1 208	537	89	89	51	39	11	14
Lithuania	3 390	2 408	2 235	66	925	27	779	278		253	42	129	2	0	1 218	2 305	1 032	86	90	54	41	12	18
Luxembourg	467	39	39	8	0	0	35	4		0			0	0	26	57	25	68	0			10	
Malta	407	38	38	9	8	2	18	11		1			0	0	14	24	11	152	74	31	21	29	3
Monaco	33															1	0						
Montenegro	598	159	147	25	41	7	78	18		10	0	1	11	0	76	193	87	71	47	34	28	12	14
Netherlands	16 419	960	930	6	187	1	354	375		14		14	16	0	400	1 234	552	74	34	35	20	40	5
Norway	4 698	307	282	6	38	1	128	116		0			24	1	138	261	117	108	33	23	13	41	8
Poland	38 082	8 616	8 019	21	2 827	7	4 150	592		450		129	468	0	4 523	9 584	4 295	79	66	41	35	7	12
Portugal	10 623	3 127	2 952	28	1 173	11	908	735		136	4	98	69	4	1 784	3 149	1 355	89	87	56	40	25	10
Republic of Moldova	3 794	6 367	4 857	128	1 610	42	2 043	513		691	364	314	832	0	1 940	5 348	2 387	78	67	44	33	11	35
Romania	21 438	25 491	22 590	105	9 425	44	6 543	3 284		3 338	1 174	982	745	0	10 456	24 635	11 026	78	85	59	42	15	24
Russian Federation	142 499	214 924	127 338	89	33 103	23	73 560	11 704		8 971			87 586	0	50 262	157 321	68 223	75	49	31	26	9	45
San Marino	31															2	1						
Serbia	9 858	2 981	2 891	29	1 146	12	1 015	506		224	13	24	53		1 867	3 190	1 428	84	80	53	40	18	11
- Serbia (without Kosovo)		2 051	1 961		905		640	229		187	13	24	53	0	1 251					59	46	12	14
- Kosovo		930	930		241		375	277		37	0	0	0	0	616					39	26	30	4
Slovakia	5 390	682	622	12	176	3	289	120		37	2	4	54	0	308	896	403	65	44	38	28	19	14
Slovenia	2 002	218	212	11	90	4	71	37		14		1	3	2	148	259	116	77	77	56	42	17	8
Spain	44 279	7 767	7 347	17	2 317	5	3 583	1 447		0			420	0	3 614	13 103	5 792	56	40	39	32	20	5
Sweden	9 119	491	460	5	96	1	198	165		1			31	0	240	544	244	84	39	33	21	36	7
Switzerland	7 484	478	425	6	95	1	281	49		0			53	0	331	460	203	92	47	25	22	12	11
Tajikistan	6 736	8 081	6 297	93	2 228	33	2 117	1 733		219	76	55	1 653	0	2 228	15 542	6 933	39	32	51	35	28	25
TFYR Macedonia	2 038	563	526	26	200	10	177	117		32	4	7	26	0	247	597	269	83	74	53	38	22	12
Turkey	74 877	19 694	18 878	25	7 527	10	4 492	5 790		1 069	59	214	543	0	8 741	22 136	9 961	80	76	63	40	31	10
Turkmenistan	4 965	3 698	3 428	69	1 378	28	1 288	681		81	0	0	270	0	2 666	3 399	1 530	98	90	52	40	20	9
Ukraine	46 205	40 643	37 517	81	11 028	24	20 255	3 608		2 626			3 126	0	11 028	46 916	20 163	74	55	35	29	10	14
United Kingdom	60 769	8 417	7 851	13	1 639	3	2 707	3 505		0			436	130	3 221	9 308	4 158	84	39	38	21	45	5
Uzbekistan	27 372	23 390	19 779	72	6 326	23	7 167	5 280		1 006	384	100	3 127	0	6 326	30 813	13 801	61	46	47	32	27	20
EUR	**889 278**	**478 299**	**350 529**	**39**	**105 288**	**12**	**165 777**	**53623**	**0**	**25 841**	**4 887**	**4 150**	**118 317**	**416**	**141 324**	**431 518**	**189 951**	**75**	**55**	**39**	**30**	**15**	**32**

ss+ indicates sputum smear-positive; ss-, sputum smear-negative; unk., sputum smear result unknown; re-treat., re-treatment; pulm. lab. confirmed, pulmonary case confirmed by positive smear or culture. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.6 **DOTS coverage, case notifications and case detection rates, Europe, 2007**

		TB cases reported from DOTS services													Estimated incidence and case detection rate				Proportions			
	DOTS	New and relapse		New pulmonary ss+		ss- / unk.	New extra-pulmonary	Other new	Re-treatment cases: Relapse	After failure	After default	Other re-treat.	Other	New pulm. lab. confirm.	Estimated incidence: all forms	ss+	DOTS case detection rate: all new	new ss+	ss+ (% of pulm.)	ss+ (% of new+relapse)	Extrapulm. (% of new+relapse)	Re-treat. (% of new+re-treat.)
	coverage %	number	rate	number	rate	number	number	number	number	number	number	number	number	number	number	number	%	%				
Albania	75	331	10	130	4	73	117		11	0	1	7	0	141	538	242	59	54	64	39	35	6
Andorra	100	5	7	2	3	1	2		0	0	0	1	0	3	14	6	35	32	67	40	40	17
Armenia	100	1 682	56	497	17	699	337		149	62	76	309	0	497	2 171	971	71	51	42	30	20	28
Austria	100	811	10	189	2	486	136		0			63	0	441	1 035	462	78	41	28	23	17	7
Azerbaijan	100	5 521	65	1 356	16	2 338	750		1 077			1 826	0	1 356	6 530	2 916	68	46	37	25	14	40
Belarus	100	5 351	55	1 051	11	3 486	335		479			405	0	1 988	5 910	2 639	82	40	23	20	6	15
Belgium	100	955	9	322	3	367	266		0			73	0	583	1 235	551	77	58	47	34	28	7
Bosnia & Herzegovina	100	2 373	60	737	19	1 252	228		156	0	0	27	0	1 266	2 012	905	110	81	37	31	10	8
Bulgaria	100	2 848	37	1 080	14	1 010	653		105	28	44	132	0	1 314	2 962	1 328	93	81	52	38	23	10
Croatia	100	951	21	382	8	394	108		67			31	0	575	1 834	825	48	46	49	40	11	10
Cyprus	100	41	5	8	1	27	6		0		1	0	0	28	42	19	97	42	23	20	15	2
Czech Republic	100	790	8	267	3	407	116		0			81	0	478	893	401	88	67	40	34	15	9
Denmark	100	355	7	135	2	137	83		0			36	0	216	438	196	81	69	50	38	23	9
Estonia	100	442	33	167	13	198	31		46	2	18	11	0	296	509	221	78	76	46	38	7	16
Finland	0	0	0	0	0	0	0		0			0	0	0	313	140	0	0				
France	0	0	0	0	0	0	0		0			0	0	0	8 548	3 798	0	0				
Georgia	100	4 310	98	1 867	42	964	1 234		245	231	169	1 200	2	1 979	3 703	1 654	110	113	66	43	29	31
Germany	100	4 609	6	1 183	1	2 326	977		123	11	36	316	48	2 725	4 910	2 198	91	54	34	26	21	10
Greece	0	0	0	0	0	0	0		0			0	0	0	1 984	886	0	0				
Hungary	100	1 540	15	381	4	957	86		116		44	168	0	653	1 672	750	85	51	28	25	6	19
Iceland	100	0	0	0	0	0	0		0			0	0	0	11	5	0	0				
Ireland	0	0	0	0	0	0	0		0			0	0	0	567	253	0	0				
Israel	100	392	6	143	2	163	80		6	1	2	2	0	227	522	233	74	61	47	36	20	3
Italy	65	0	0	0	0	0	0		0			0	0	0	4 336	1 923	0	0				
Kazakhstan	100	24 667	160	6 146	40	12 015	3 293		3 213	2 142	1 554	9 444	0	7 130	19 894	8 896	108	69	34	25	13	43
Kyrgyzstan	100	6 054	114	1 720	32	2 176	1 727		431			609	0	1 720	6 451	2 884	87	60	44	28	29	16
Latvia	100	1 227	54	478	21	464	137		148	3	21	4	0	788	1 208	537	89	89	51	39	11	14
Lithuania	100	2 235	66	925	27	779	278		253	42	129	2	0	1 218	2 305	1 032	86	90	54	41	12	18
Luxembourg	100	1	0	0	0	1	0		0			0	0	1	57	25	2	0				
Malta	100	38	9	8	2	18	11		1			0	0	14	24	11	152	74	31	21	29	3
Monaco															1	0						
Montenegro	0	0	0	0	0	0	0		0			0	0	0	193	87	0	0				
Netherlands	100	179	1	59	0	68	49		3		10	2	0	107	1 234	552	14	11	46	33	27	8
Norway	100	282	6	38	1	128	116		0			24	1	138	261	117	108	33	23	13	41	8
Poland	100	8 019	21	2 827	7	4 150	592		450		129	468	0	4 523	9 584	4 295	79	66	41	35	7	12
Portugal	100	2 952	28	1 173	11	908	735		136	4	98	69	4	1 784	3 149	1 355	89	87	56	40	25	10
Republic of Moldova	100	4 857	128	1 610	42	2 043	513		691	364	314	832	0	1 940	5 348	2 387	78	67	44	33	11	35
Romania	100	22 590	105	9 425	44	6 543	3 284		3 338	1 174	982	745	0	10 456	24 635	11 026	78	85	59	42	15	24
Russian Federation	100	127 338	89	33 103	23	73 560	11 704		8 971			87 586	0	50 262	157 321	68 223	75	49	31	26	9	45
San Marino															2	1						
Serbia	100	2 891	29	1 146	12	1 015	506		224	13	24	53	0	1 867	3 190	1 428	84	80	53	40	18	11
Serbia (without Kosovo)		1 961		905		640	229		187	13	24	53	0	1 251					59	46	12	14
Kosovo		930		241		375	277		37	0	0	0	0	616					39	26	30	4
Slovakia	100	622	12	176	3	289	120		37	2	4	54	0	308	896	403	65	44	38	28	19	14
Slovenia	100	212	11	90	4	71	37		14		1	3	2	148	259	116	77	77	56	42	17	8
Spain	0	0	0	0	0	0	0		0			0	0	0	13 103	5 792	0	0				
Sweden	0	0	0	0	0	0	0		0			0	0	0	544	244	0	0				
Switzerland	20	0	0	0	0	0	0		0			0	0	0	460	203	0	0				
Tajikistan	100	5 905	88	2 075	31	1 966	1 645		219	76	55	1 653	0	2 075	15 542	6 933	37	30	51	35	28	26
TFYR Macedonia	100	526	26	200	10	177	117		32	4	7	26	0	247	597	269	83	74	53	38	22	12
Turkey	100	18 878	25	7 527	10	4 492	5 790		1 069	59	214	543	0	8 741	22 136	9 961	80	76	63	40	31	10
Turkmenistan	80	2 927	59	1 288	26	1 099	459		81	0	0	270	0	2 387	3 399	1 530	84	84	54	44	16	11
Ukraine	100	37 517	81	11 028	24	20 255	3 608		2 626			3 126	0	11 028	46 916	20 163	74	55	35	29	10	14
United Kingdom	0	0	0	0	0	0	0		0			0	0	0	9 308	4 158	0	0				
Uzbekistan	100	18 908	69	6 217	23	6 863	4 828		1 000	384	99	3 101	0	6 217	30 813	13 801	58	45	48	33	26	20
EUR	**75**	**322 132**	**36**	**97 156**	**11**	**154 365**	**45 094**	**0**	**25 517**	**4 602**	**4 032**	**113 302**	**57**	**127 865**	**431 518**	**189 951**	**69**	**51**	**39**	**30**	**14**	**33**

ss+ indicates sputum smear-positive; ss-, sputum smear-negative; unk., sputum smear result unknown; re-treat., re-treatment; pulm. lab. confirmed, pulmonary case confirmed by positive smear or culture. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.7 **Laboratory services, collaborative TB/HIV activities and management of MDR-TB, Europe, 2006–2007**

	Laboratory services, 2007				Collaborative TB/HIV activities								Management of MDR-TB, 2007				
					2006				2007								
	Number of labs working with NTP			Smear labs included in EQA	TB pts tested for HIV	TB pts HIV-positive	HIV+ TB pts CPT	HIV+ TB pts ART	TB pts tested for HIV	TB pts HIV-positive	HIV+ TB pts CPT	HIV+ TB pts ART	Lab-confirmed MDR	DST in new cases	MDR in new cases	Re-treatment DST	Re-treatment MDR
	smear	culture	DST														
Albania	17	1	1	0	51	3	0	3	37	1	0	1	3	168	1	18	2
Andorra	8	8	8	0									0	3	0	0	0
Armenia	46	2	1	4	332	25	15	11	335	8	5	4	125	429	50	213	75
Austria								17					9	481	8	31	1
Azerbaijan	69									31			196	213	13	257	183
Belarus									5 756	152			870	1 874	302	1 243	455
Belgium	163	155	17		927	55			871	52			14	707	10	52	4
Bosnia & Herzegovina	14	6	4		0				0				8	1 267	3	156	3
Bulgaria	35	33	22	2	247	6	0	0	199	6	0	0	82	883	36	121	46
Croatia	17	17	7										7	5	5	2	2
Cyprus		1		1	0	0	0	0	42	0	0	0	3	28	2	1	1
Czech Republic	42	42	14	3	163	4			161	7			11	487	8	45	3
Denmark		1	1		11	11	0	0	6	6	0	0	2	269	2	21	0
Estonia	8	2	2	0	414	41	0		450	54	0		80	316	52	65	28
Finland	11	11	1		6	6				10			2	216	2	8	0
France	300	300	100										20	1 255	12	102	7
Georgia	30	2	1	0	649	17	10	9	842	29	21	21	269	1 366	87	556	182
Germany	230	192	79										66	2 998	44	244	22
Greece													14	488	13	43	0
Hungary													11	456	8	84	3
Iceland					10	2	0	1					1	10	0	1	1
Ireland	13	13	3	0	45	13			15	7			5	127	3	15	2
Israel			2			15				16			18	257	14	11	4
Italy													56	653	16	79	21
Kazakhstan	446	22	22	0	43 204	234	90	37	24 532	213	25	22	5 568	7 997	1 596	7 509	3 972
Kyrgyzstan	122	10	1				0						322	1 018	168	200	154
Latvia	26	8	1	24	1 128	47		36	1 066	55		30	98	810	58	165	40
Lithuania	12	5	5	11		13				21			314	1 257	126	425	188
Luxembourg													1	32	1	0	0
Malta	1	1	0	1	1	2	1	1	27	2	1	2	1	18	1	0	0
Monaco																	
Montenegro	1	1	1		17	1	0	1	32	0	0	0	2	76	0	11	2
Netherlands	53	53	17		201	43			195	32			6	553	3		
Norway	19	12	4	0	0				0				3	225	2	17	1
Poland	96	96	55	31						15			51	2 716	8	522	43
Portugal	60	60	16	0	2 677	508	0	0	2 299	456	0	0	34	1 446	21	144	13
Republic of Moldova	57	4	4	0	2 523	20	4	16	4 349	161	5	34	896	1 311	311	934	585
Romania	136	106	55	122	8 402	60			6 727	187			754	2 355	99	2 311	655
Russian Federation	4 048	965	280		87 041	1 979	0	1 037	87 444	2 401	0		5 297	30 370	3 959	4 828	1 338
San Marino																	
Serbia	51	41	9	6	5	5	0	5	9	9		9	25	1 130	7	185	18
Slovakia	16	11	5	11	708	0	0	0	682	0	0	0	7	343	3	53	4
Slovenia					70	1	1	1	99	0	1	1	0	174	0	15	0
Spain					3 566												
Sweden	5	5	5		0				0				15	346	12	19	3
Switzerland				42	0				0				8	264	5	37	3
Tajikistan	97	0	0	5	1 639	3	0	0	1 443	62	0	0					
TFYR Macedonia	13	3	1	0	96	0	0	0	97	1	0	0	9	167	0	26	9
Turkey	172	23	7	0	0	0	0	0	0				240	4 142	120	775	120
Turkmenistan					0	0	0	0	0	0	0	0	0	0	0	0	0
Ukraine						1 987	0			2 345							
United Kingdom			9										55	4 510	41	221	14
Uzbekistan	310	4	2	21	37 565	238	154	9	31 682	371	347	14	484	385	119	463	365
EUR	**6 744**	**2 216**	**762**	**284**	**191 698**	**5 339**	**275**	**1 184**	**169 397**	**6 710**	**405**	**138**	**16 062**	**76 601**	**7 351**	**22 228**	**8 572**

ART indicates antiretroviral therapy; CPT, co-trimoxazole preventive therapy; DST, drug susceptibility testing; EQA, external quality assurance; HIV+, HIV-positive; pts, patients. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.8 **Treatment outcomes, Europe, 2006 cohort**

	New smear-positive cases, DOTS											New smear-positive cases, non-DOTS											Smear-positive re-treatment cases, DOTS								
	Number of cases		% of notif	% of cohort							%	Number of cases		% of notif	% of cohort							%	Number	% of cohort							%
	Notified	Regist'd	regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	Success	Notified	Regist'd	regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	Success	Regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	Success
Albania	99	99	100	73	20	1	1	5	0	0	93	87	87	100	22	66	1	0	3	0	8	87	8	63	13	13	0	13	0	0	75
Andorra	8	8	100	13	63				25	0	75																				
Armenia	580	580	100	53	16	5	10	14	1	1	69												304	26	10	9	18	32	3	2	36
Austria	213	206	97	16	55	8	0	9	0	12	71												17	6	71	0	0	18	0	6	76
Azerbaijan	1 454	1 454	100	50	10	2	3	12	22	1	60												1 272	34	12	6	7	16	24	1	46
Belarus	1 072	1 072	100	62	8	13	8	2	4	4	70												549	47	12	11	16	2	3	9	59
Belgium *	343	280	82	24	49	8	0	1	1	16	73												32	22	31	9	0	0	0	38	53
Bosnia & Herzegovina	562	993	177	94	3	1	1	1	1	1	97												93	89	5	2	0	1	1	1	95
Bulgaria	1 307	1 307	100	72	7	5	3	6	2	4	80												125	68	2	14	6	10	0	0	70
Croatia		898		25	4	7	0	2	1	60	30	396											82	61	1	18	0	2	2	15	62
Cyprus	8	8	100	63	25	0	0	0	13	0	88												1	0	100	0	0	0	0	0	100
Czech Republic	257	257	100	60	9	6	0	2	1	23	69												8	25	13	0	0	0	13	50	38
Denmark	123	31	25	35	42	3	0	0	0	19	77												13	38	46	0	0	8	8	0	85
Estonia	147	148	101	65	3	14	1	5	0	11	68		1		0	0	100	0	0	0	0	**0**	38	50	3	16	3	18	0	11	53
Finland												84																			
France												1 911																			
Georgia	1 831	1 813	99	64	11	3	6	10	4	2	75												1 154	38	11	8	18	17	5	3	49
Germany *	1 303												1 167		20	20	10	0	4	0	46	40									
Greece												210																			
Hungary	422	430	102	31	15	11	15	8	6	14	46												94	21	17	13	22	6	5	15	38
Iceland	4												4		0	50	25	0	0	0	25	50									
Ireland												133	186	140	2	64	6		2		27	66									
Israel	72	209	290	66	9	14	0	5	4	2	74												4	100	0	0	0	0	0	0	100
Italy	1 377												1 305		0	0	0	0	0	0	100	0									
Kazakhstan	6 151	6 113	99	71	1	4	16	5	2	1	72	54											11 731	24	7	17	18	7	3	24	31
Kyrgyzstan	1 833	1 830	100	80	3	5	5	5	2	0	82												448	67	4	8	10	9	2	0	71
Latvia	498	498	100	72	1	11	1	6	0	9	73												133	43	2	18	2	10	0	26	44
Lithuania	1 029	1 028	100	74	0	12	2	10	0	3	74												350	36	0	27	4	18	0	15	36
Luxembourg	1											21																			
Malta	4	4	100	0	100	0	0	0	0	0	100																				
Monaco																															
Montenegro												58	58	100	7	26	5	0	3	0	59	33									
Netherlands *	203																														
Norway	46	41	89	68	24	0	0	0	7	0	93												5	60	0	0	0	0	20	20	60
Poland	2 835	2 819	99	63	12	7	1	9	1	6	75												488	42	7	8	1	32	1	9	49
Portugal	1 300	1 372	106	14	73	4	0	4	1	3	87												181	14	62	9	1	7	2	5	77
Republic of Moldova	1 679	1 671	100	59	4	11	11	12	3	2	62												1 105	31	4	16	20	17	8	4	35
Romania	9 814	10 075	103	69	13	6	3	4	1	4	83												4 993	42	9	11	11	13	1	13	51
Russian Federation	29 989	30 745	103	56	3	12	15	10	5	0	58	2 346											17 109	33	5	14	26	14	8	0	38
San Marino																															
Serbia	1 136	1 157	102	72	12	6	2	4	1	3	84												189	62	12	8	2	12	2	2	75
Slovakia	160	149	93	78	3	9	6	1	1	3	81												42	55	5	29	2	2	0	7	60
Slovenia	83	83	100	35	57	4	0	5	0	0	92												4	0	75	25	0	0	0	0	75
Spain												2 006																			
Sweden		265		0	63	7	1	0	28	0	63	106																			
Switzerland												112																			
Tajikistan	1 986	1 753	88	81	4	4	6	4	2	0	84	65	179	275	71	17	8	1	3	0	0	88	1 076	60	6	10	12	6	5	0	67
TFYR Macedonia	178	178	100	71	16	5	1	7	0	0	87												37	35	32	14	5	5	0	8	68
Turkey	7 866	7 865	100	58	32	3	1	4	0	2	91												1 262	45	29	5	2	11	0	9	74
Turkmenistan	830	830	100	81	2	7	5	4	1	0	84	325	325	100	91	2	4	3	0	0	0	93	179	65	3	12	8	11	1	0	68
Ukraine	14 206	10 351	73	54	5	12	12	9	4	4	59												7 480	34	6	15	22	14	7	1	41
United Kingdom *												1 767	1 350	76		72	7	0	1	2	18	72									
Uzbekistan	7 093	5 642	80	73	8	6	6	6	1	0	81	118											1 260	51	9	13	13	14	1	0	60
EUR	**100 102**	**94 262**	**94**	**61**	**9**	**8**	**9**	**7**	**3**	**2**	**70**	**9 799**	**4 662**	**48**	**15**	**31**	**6**	**0**	**2**	**0**	**46**	**46**	**51 866**	**34**	**7**	**14**	**19**	**12**	**5**	**8**	**42**

* indicates that "notified cases" in this table include cases with "history unknown", whereas "registered cases" does not.
Not eval. indicates not evaluated (percentage of registered cases for which outcomes were not recorded); success, sum of cured and completed; cases regist'd, the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2006 is used as the denominator for calculating treatment outcomes unless it is less than the sum of outcomes, in which case the sum of outcomes is used. If the number of cases registered is not reported, then the number of cases notified in 2006 is used, or the sum of outcomes if the latter is greater. Data can be downloaded from www.who.int/tb

Table A3.9 **DOTS re-treatment outcomes, Europe, 2006 cohort**

	Relapse, DOTS									After failure, DOTS									After default, DOTS								
		% of cohort									% of cohort									% of cohort							
	Number regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	% Success	Number regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	% Success	Number regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	% Success
Albania	8	63	13	13	0	13	0	0	75																		
Andorra																											
Armenia	169	33	8	8	19	28	4	2	40	72	18	17	14	21	26	1	3	35	63	19	6	8	13	49	5	0	25
Austria																											
Azerbaijan	1 272	34	12	6	7	16	24	1	46																		
Belarus	549	47	12	11	16	2	3	9	59																		
Belgium																											
Bosnia & Herzegovina	93	89	5	2	0	1	1	1	95																		
Bulgaria	125	68	2	14	6	10	0	0	70																		
Croatia	82	61	1	18	0	2	2	15	62																		
Cyprus																			1	0	100	0	0	0	0	0	100
Czech Republic																											
Denmark																											
Estonia	28	57	4	14	0	11	0	14	61										10	30	0	20	10	40	0	0	30
Finland																											
France																											
Georgia	231	48	8	4	16	14	6	3	56	217	23	10	13	29	14	6	4	33	231	31	13	9	14	26	5	3	44
Germany																											
Greece																											
Hungary	73	19	18	12	23	7	5	15	37										17	24	18	18	12	6	6	18	41
Iceland																											
Ireland																											
Israel	3	100	0	0	0	0	0	0	100										1	100	0	0	0	0	0	0	100
Italy																											
Kazakhstan	2 851	50	1	12	23	7	3	4	51	1 590	25	13	11	27	5	4	16	37	1 726	19	13	15	16	14	5	17	32
Kyrgyzstan	448	67	4	8	10	9	2	0	71																		
Latvia	103	42	2	21	0	4	0	31	44	1	0	0	0	100	0	0	0	0	29	48	0	7	3	31	0	10	48
Lithuania	201	45	0	24	5	13	0	13	45	43	37	0	35	5	12	0	12	37	106	18	0	31	1	31	0	19	18
Luxembourg																											
Malta																											
Monaco																											
Montenegro																											
Netherlands																											
Norway																											
Poland	281	48	7	9	1	28	1	7	54										73	38	4	7	3	38	3	7	42
Portugal	107	19	61	8	1	6	0	6	79	2	0	50	0	0	0	50	0	50	72	8	65	10	0	10	3	4	74
Republic of Moldova	601	39	3	15	18	14	7	4	42	298	24	5	15	27	15	8	5	30	206	17	5	23	17	27	8	3	21
Romania	3 096	51	12	9	10	10	1	8	62	1 201	26	5	16	16	13	0	23	31	696	28	7	13	8	24	1	18	36
Russian Federation	5 238	41	5	15	22	11	6	0	46																		
San Marino																											
Serbia	157	64	13	8	3	8	2	2	78	15	73	0	7	0	20	0	0	73	17	35	12	12	0	41	0	0	47
Slovakia	31	48	6	32	3	3	0	6	55	3	67	0	0	0	0	0	33	67	5	80		20				0	80
Slovenia	2	0	100	0	0	0	0	0	100										2		50	50				0	50
Spain																											
Sweden																											
Switzerland																											
Tajikistan	116	63	8	16	12	0	1	0	71	67	57	7	13	16	3	3	0	64	28	64	4	14	4	14	0	0	68
TFYR Macedonia	23	43	30	13	4	4	0	4	74	3	0	33	0	33	0	0	33	33	11	27	36	18	0	9	0	9	64
Turkey	955	49	31	5	2	6	0	8	80	45	31	16	2	11	11	0	29	47	226	31	27	4	1	28	0	9	58
Turkmenistan	99	69	2	12	8	9	0	0	71																		
Ukraine	2 172	42	9	11	17	10	6	4	51										2 654	31	5	17	24	16	7	0	36
United Kingdom																											
Uzbekistan	779	57	8	12	9	13	1	0	65	370	42	11	14	20	12	1	0	53	111	37	7	14	14	26	1	0	44
EUR	**19 893**	**46**	**8**	**12**	**15**	**10**	**5**	**4**	**54**	**3 927**	**27**	**9**	**13**	**22**	**10**	**3**	**15**	**37**	**6 285**	**27**	**9**	**15**	**17**	**19**	**5**	**8**	**36**

Not eval. indicates not evaluated (percentage of registered cases for which outcomes were not recorded); success, sum of cured and completed; cases regist'd, the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2006 is used as the denominator for calculating treatment outcomes unless it is less than the sum of outcomes, in which case the sum of outcomes is used. If the number of cases registered is not reported, then the number of cases notified in 2006 is used, or the sum of outcomes if the latter is greater. Data can be downloaded from www.who.int/tb

Table A3.10 **DOTS treatment success and case detection rates, Europe, 1994–2007**

	DOTS new smear-positive treatment success (%)													DOTS new smear-positive case detection rate (%)												
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Albania								98	90	91	78	77	93							25	30	31	35	24	38	54
Andorra					100	67	50	100	100	100	100	80	75			224	14	58	15	46	31	109	47	78	125	32
Armenia		83	77	82	81	88	87	90	79	77	70	72	69	12	25	44	44	41	47	29	30	43	48	60	60	51
Austria						77	73	64	78	68	69	75	71						62	52	44	55	45	49	46	41
Azerbaijan			86	87	86	88	91	66	84	70	60	59	60	5	9	7	7	7	6	0	46	29	47	55	50	46
Belarus										73	74	73	70									39	42	46	40	40
Belgium								64	69	73	72	66	73							65	62	56	64	62	59	58
Bosnia & Herzegovina				93	88	90	94	98	95	94	98	97	97				38	67	71	80	53	51	95	70	62	81
Bulgaria								87	86	91	80	86	80						24	11	49	90	96	88	96	81
Croatia													30													46
Cyprus					42			92	75	79	20	63	88				91	43			40	72	52	47	42	42
Czech Republic	73	60	66	69	65	78	70	73	73	79	73	72	69	52	64	53	64	57	60	62	57	63	60	64	58	67
Denmark									77	84	88	83	77									69	72	64	62	69
Estonia						63	70	64	67	70	71	72	68						64	57	62	67	75	65	63	76
Finland																										
France																										
Georgia		58		65	78	61	63	67	65	66	68	73	75	18	35		34	45	34	58	57	58	78	90	110	113
Germany				54	54	58	77	67	69	71	68	71				63	62	62		53	57	54	54	52	54	54
Greece																										
Hungary					80		64	46	55	48	54	45	46					36	25	36	39	41	49	42	48	51
Iceland								67	100	100	50	100								68	60	31	58	44	85	
Ireland																										
Israel							78	79	81	80	80	78	74						7	73	69	65	39	42	31	61
Italy		80	82	69	72	71	74	40	79	95		74			14	9	13	56	31	10	60	73	53	65	71	
Kazakhstan					79	79	79	78	78	75	72	71	72				4	79	94	93	95	87	81	74	67	69
Kyrgyzstan			88	76	82	83	82	81	82	84	85	85	82		3	4	31	58	42		48	56	61	66	64	60
Latvia		61	64	65	71	74	72	73	76	74	73	74	73		71	70	72	64	72	76	77	84	83	83	84	89
Lithuania					79	84	92	75	72	74	72	70	74					3	2	30	56	87	86	99	103	90
Luxembourg																				41	63	119	77	55	4	
Malta		100	100	100	100	75	100	100	60	100	100	100	100		35	22	45	72	41	26	43	18	18	45	37	74
Monaco																										
Montenegro																										
Netherlands	81	72	81	80	65	79	76		68	86	83	84		77	49	44	37	47	46	51	55	48	63	42	36	11
Norway		77	80	44	69	77	70	87	80	97	89	91	93		68	67	34	16	28	47	25	43	42	40	39	33
Poland					75	69	72	77	86	78	79	77	75				2	3	4	3	56	57	57	62	64	66
Portugal	48	69	74	78	74	85	79	78	82	84	84	89	87	79	78	67	87	83	92	102	102	95	91	84	89	87
Republic of Moldova							83	66	61	65	62	62	62							41	22	41	63	70	70	67
Romania				72	85	78	80	78	76	80	82	82	83				87	4	10	10	43	40	43	83	82	85
Russian Federation		65	62	67	68	65	68	67	67	61	59	58	58		0	1	1	2	5	6	8	9	15	34	45	49
San Marino				100												101			113							
Serbia								88	91	89	91	85	84							26	24	37	31	76	79	80
Slovakia	96	64	73	67	85	79	82	87	85	87	88	92	81	80	85	34	40	35	37	37	34	38	34	39	39	44
Slovenia		90	87	82	78	88	84	82	85	85	90	84	92		79	58	65	74	71	73	75	75	63	84	67	77
Spain																										
Sweden													63													
Switzerland																										
Tajikistan									79	86	84	86	84								2		11	23	32	30
TFYR Macedonia							86	88	79	84	84	84	87							54	49	49	72	65	66	74
Turkey										93	91	89	91									5	3	3	81	76
Turkmenistan							69	75	77	82	86	81	84						17	36	42	43	33	44	54	84
Ukraine													59												70	55
United Kingdom																										
Uzbekistan					78	79	80	76	80	81	78	81	81				0	2	4	7	22	21	29	38	51	45
EUR	**68**	**69**	**72**	**72**	**76**	**77**	**77**	**75**	**76**	**75**	**74**	**71**	**70**	**3**	**3**	**5**	**11**	**11**	**12**	**14**	**22**	**24**	**26**	**37**	**53**	**51**

Treatment success, sum of cured and completed; DOTS new smear-positive case detection rate, notified new smear-positive cases divided by estimated incident cases. Figures for all years are updated as new information becomes available and/or techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.11 **New smear-positive case notification by age and sex, DOTS and non-DOTS, Europe, 2007**

	Male							Female							All							Male/female
	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+	ratio
Albania	0	19	13	16	24	16	19	2	13	9	7	7	11	9	2	32	22	23	31	27	28	1.8
Andorra										1		1					1		1			
Armenia	1	81	87	100	92	29	20	2	31	22	11	7	7	7	3	112	109	111	99	36	27	4.7
Austria	1	12	15	27	26	18	25	2	10	14	7	11	2	19	3	22	29	34	37	20	44	1.9
Azerbaijan																						
Belarus		57	142	205	244	110	56		28	58	41	35	17	58		85	200	246	279	127	114	3.4
Belgium *	2	23	55	35	38	18	43	4	13	31	23	7	8	22	6	36	86	58	45	26	65	2.0
Bosnia & Herzegovina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bulgaria	7	63	122	181	176	131	90	4	63	77	53	38	29	46	11	126	199	234	214	160	136	2.5
Croatia																						
Cyprus	0	2	1	0	0	0	0	0	1	3	1	0	0	0	0	3	4	1	0	0	0	0.6
Czech Republic	0	14	26	35	63	39	29	0	6	8	5	9	5	28	0	20	34	40	72	44	57	3.4
Denmark	0	6	12	20	29	16	6	1	8	12	8	4	5	8	1	14	24	28	33	21	14	1.9
Estonia	0	6	26	32	37	21	12	0	2	5	5	8	7	6	0	8	31	37	45	28	18	4.1
Finland	0	4	5	5	10	7	24	0	6	4	2	5	0	13	0	10	9	7	15	7	37	1.8
France	17	120	225	196	219	156	273	20	127	167	91	56	61	188	37	247	392	287	275	217	461	1.7
Georgia	7	277	388	308	230	96	75	6	153	140	67	54	17	46	13	430	528	375	284	113	121	2.9
Germany *	2	116	248	314	344	184	362	4	120	176	152	116	46	178	6	236	424	466	460	230	540	2.0
Greece	1	21	22	34	28	15	54	0	13	19	11	8	3	24	1	34	41	45	36	18	78	2.2
Hungary	0	7	31	48	103	50	35	3	12	22	18	17	6	29	3	19	53	66	120	56	64	2.6
Iceland	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	2	0	0	2	
Ireland	0	26	49	32	28	26	26	0	14	28	22	14	2	4	0	40	77	54	42	28	30	2.2
Israel	1	9	20	23	13	10	17	1	4	17	5	3	6	14	2	13	37	28	16	16	31	1.9
Italy	3	75	170	113	87	48	106	7	74	94	58	31	19	76	10	149	264	171	118	67	182	1.7
Kazakhstan	14	881	976	859	714	279	150	38	782	605	367	249	124	157	52	1 663	1 581	1 226	963	403	307	1.7
Kyrgyzstan	3	243	274	186	186	62	63	11	216	213	114	67	47	61	14	459	487	300	253	109	124	1.4
Latvia		33	65	93	102	49	19	1	18	27	32	18	12	9	1	51	92	125	120	61	28	3.1
Lithuania	0	31	77	165	235	109	76	0	34	41	48	50	22	37	0	65	118	213	285	131	113	3.0
Luxembourg	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	
Malta	0	0	2	0	0	1	3	0	2	0	0	0	0	0	0	2	2	0	0	1	3	3.0
Monaco																						
Montenegro	0	0	6	3	10	1	3	0	3	3	4	3	3	1	0	3	9	7	13	4	4	1.4
Netherlands *	1	10	22	28	21	15	15	1	12	22	17	6	5	12	2	22	44	45	27	20	27	1.5
Norway		4	12	2	3	1	2	1	4	2	5	1		1	1	8	14	7	4	1	3	1.7
Poland	2	85	213	395	677	344	285	4	65	149	120	132	79	277	6	150	362	515	809	423	562	2.4
Portugal	4	69	178	268	188	82	112	2	49	95	61	27	12	26	6	118	273	329	215	94	138	3.3
Republic of Moldova	0	181	281	343	314	107	35	2	97	85	57	58	25	25	2	278	366	400	372	132	60	3.6
Romania	25	706	1 149	1 559	1 704	889	611	34	665	634	439	332	230	448	59	1 371	1 783	1 998	2 036	1 119	1 059	2.4
Russian Federation	20	2 492	6 008	5 874	6 363	2 491	1 291	40	1 444	2 418	1 684	1 454	653	871	60	3 936	8 426	7 558	7 817	3 144	2 162	2.9
San Marino																						
Serbia	0	42	59	102	163	94	106	2	38	52	43	43	26	135	2	80	111	145	206	120	241	1.7
Slovakia	0	8	10	18	51	15	23	1	5	3	5	6	3	28	1	13	13	23	57	18	51	2.5
Slovenia	0	0	7	15	14	12	9	0	1	5	6	2	3	16	0	1	12	21	16	15	25	1.7
Spain	10	184	375	379	257	128	191	12	164	291	136	63	23	93	22	348	666	515	320	151	284	1.9
Sweden	0	7	20	10	5	3	9	1	5	11	8	4	1	12	1	12	31	18	9	4	21	1.3
Switzerland	0	11	10	11	7	5	11	1	9	17	3	0	3	7	1	20	27	14	7	8	18	1.4
Tajikistan	13	413	361	194	132	63	65	21	329	243	154	92	61	87	34	742	604	348	224	124	152	1.3
TFYR Macedonia	1	12	22	27	46	21	19	4	11	12	9	4	4	8	5	23	34	36	50	25	27	2.8
Turkey	50	1 091	1 245	984	978	571	512	63	708	531	246	165	128	255	113	1 799	1 776	1 230	1 143	699	767	2.6
Turkmenistan	2	176	272	224	137	56	23	6	129	132	81	69	36	35	8	305	404	305	206	92	58	1.8
Ukraine	14	1 556	4 507	5 206	5 024	2 130	1 090	7	982	1 661	1 314	855	438	861	21	2 538	6 168	6 520	5 879	2 568	1 951	3.2
United Kingdom *	13	183	286	223	169	97	202	20	145	222	91	58	45	138	33	328	508	314	227	142	340	1.6
Uzbekistan	18	569	768	579	583	282	380	25	485	507	342	255	235	436	43	1 054	1 275	921	838	517	816	1.4
EUR	**232**	**9 925**	**18 862**	**19 472**	**19 874**	**8 897**	**6 577**	**353**	**7 100**	**8 888**	**5 975**	**4 444**	**2 469**	**4 813**	**585**	**17 025**	**27 750**	**25 447**	**24 318**	**11 366**	**11 390**	**2.5**

For some countries, breakdown of notified cases by age and sex is missing, or is provided for a subset of cases. For countries marked with *, cases with "history unknown" are included in Tables A2.2 and A2.3 but not in this table. For some countries, breakdown of notified cases by age and sex is missing, or is provided for a subset of cases. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.12 **New smear-positive case notification rates by age and sex, DOTS and non-DOTS, Europe, 2007**

	Male							Female							All						
	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+
Albania	0	6	6	8	12	12	14	1	4	4	3	4	9	6	0	5	5	5	8	11	10
Andorra																					
Armenia	0	27	45	62	46	32	14	1	10	10	5	3	6	3	1	19	26	30	22	17	8
Austria	0	2	3	4	4	4	4	0	2	3	1	2	0	2	0	2	3	2	3	2	3
Azerbaijan																					
Belarus		7	19	31	34	27	13		4	8	6	4	3	6		5	14	18	18	13	8
Belgium	0	4	8	4	5	3	6	0	2	5	3	1	1	2	0	3	6	4	3	2	4
Herzegovina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bulgaria	1	12	21	34	33	27	17	1	13	14	10	7	5	6	1	13	18	22	20	16	10
Croatia																					
Cyprus	0	3	2	0	0	0	0	0	2	5	2	0	0	0	0	2	3	1	0	0	0
Czech Republic	0	2	3	5	9	6	5	0	1	1	1	1	1	3	0	2	2	3	5	3	4
Denmark	0	2	3	5	8	4	2	0	3	4	2	1	1	2	0	2	4	3	4	3	2
Estonia	0	6	27	37	43	32	16	0	2	5	5	8	8	4	0	4	16	21	24	18	8
Finland	0	1	2	1	3	2	7	0	2	1	1	1	0	3	0	2	1	1	2	1	4
France	0	3	6	5	5	4	7	0	3	4	2	1	2	3	0	3	5	3	3	3	5
Georgia	2	75	131	110	79	53	30	2	42	44	21	16	8	12	2	59	86	63	45	28	19
Germany	0	2	5	5	5	4	5	0	3	4	2	2	1	2	0	2	4	3	4	2	3
Greece	0	3	2	4	4	2	6	0	2	2	1	1	0	2	0	3	2	3	2	1	4
Hungary	0	1	4	7	15	9	6	0	2	3	3	2	1	3	0	2	3	5	8	4	4
Iceland	0	0	0	0	0	0	0	0	0	0	10	0	0	10	0	0	0	5	0	0	6
Ireland	0	8	13	10	11	12	12	0	5	8	7	5	1	1	0	6	11	9	8	7	6
Israel	0	2	4	6	4	4	6	0	1	3	1	1	2	3	0	1	4	3	2	3	4
Italy	0	3	4	2	2	1	2	0	3	2	1	1	1	1	0	3	3	2	1	1	2
Kazakhstan	1	58	81	85	80	63	36	2	53	48	33	24	20	20	1	55	64	58	50	38	26
Kyrgyzstan	0	42	65	57	72	54	54	1	38	50	34	23	35	34	1	40	57	45	47	44	42
Latvia		18	40	59	67	45	15	1	10	17	20	10	8	3	0	14	28	39	37	24	7
Lithuania	0	11	33	67	104	72	42	0	13	18	19	20	11	11	0	12	26	42	59	37	21
Luxembourg	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Malta	0	0	6	0	0	4	13	0	7	0	0	0	0	0	0	3	3	0	0	2	5
Monaco																					
Montenegro	0	0	14	8	25	4	8	0	6	7	10	7	9	2	0	3	11	9	16	7	5
Netherlands	0	1	2	2	2	1	1	0	1	2	1	1	0	1	0	1	2	2	1	1	1
Norway		1	4	1	1	0	1	0	1	1	1	0		0	0	1	2	1	1	0	0
Poland	0	3	7	16	23	17	15	0	2	5	5	4	3	9	0	3	6	11	14	10	11
Portugal	0	11	21	34	27	14	15	0	8	12	8	4	2	2	0	9	17	21	15	8	8
Moldova	0	47	105	152	125	66	23	1	27	33	25	19	12	9	0	37	69	87	68	36	14
Romania	1	44	65	99	121	82	47	2	43	37	28	22	18	24	2	43	51	64	70	48	33
Federation	0	21	55	60	60	41	21	0	13	22	17	12	8	7	0	17	38	38	34	22	11
San Marino																					
Serbia	0	6	8	15	24	18	17	0	5	7	7	6	5	16	0	6	8	11	15	11	17
Slovakia	0	2	2	5	13	5	10	0	1	1	1	1	1	7	0	2	1	3	7	3	8
Slovenia	0	0	5	10	9	10	7	0	1	3	4	1	2	8	0	0	4	7	5	6	8
Spain	0	7	10	10	9	6	6	0	7	8	4	2	1	2	0	7	9	7	5	3	4
Sweden	0	1	3	2	1	0	1	0	1	2	1	1	0	1	0	1	3	1	1	0	1
Switzerland	0	2	2	2	1	1	2	0	2	4	0	0	1	1	0	2	3	1	1	1	2
Tajikistan	1	53	82	56	53	61	57	2	43	52	41	34	55	61	1	48	66	48	43	58	59
TFYR Macedonia	1	7	14	18	32	21	19	2	7	8	6	3	4	6	1	7	11	12	18	12	12
Turkey	0	16	19	18	25	24	27	1	11	8	5	4	5	11	1	13	14	12	15	15	18
Turkmenistan	0	32	67	70	60	57	26	1	24	32	25	27	31	26	1	28	50	47	43	43	26
Ukraine	0	43	130	169	156	102	43	0	28	48	40	23	15	17	0	36	89	102	84	52	26
United Kingdom	0	4	7	5	4	3	5	0	4	6	2	1	1	2	0	4	7	3	3	2	3
Uzbekistan	0	19	35	35	47	54	71	1	16	23	20	19	41	59	0	17	29	27	33	47	64
EUR	**0**	**15**	**29**	**30**	**33**	**21**	**13**	**0**	**11**	**14**	**9**	**7**	**5**	**6**	**0**	**13**	**21**	**20**	**20**	**12**	**9**

Rates are per 100 000 population of each age/sex group. Rates are calculated excluding those countries for which breakdown of notified cases or population by age and sex is missing. Data can be downloaded from www.who.int/tb

Table A3.13 **TB case notifications, Europe, 1980–2007**

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Albania	1 050	954	978	891	975	916	989	915	759	695	653	628			707	641	738	655	694	733	604	555	594	543	547	506	469	438
Andorra										12	23	24	21	15	24		17	19	8	10	12	10	5	10	7	10	12	5
Armenia	756	924	759	702	774	768	832	766	651	649	590	741	235	590	753	1 157	928	1 026	1 455	1 488	1 333	1 389	1 433	1 538	1 660	2 206	1 767	1 682
Austria	2 191	2 061	1 942	1 825	1 765	1 442	1 377	1 390	1 402	1 334	1 521	1 426	1 354	1 267	1 264	1 481	1 290	1 394	1 302	1 085	1 185	1 013	1 044	946	895	928	855	811
Azerbaijan	3 080	3 180	3 217	3 176	3 506	3 772	3 804	3 677	3 340	2 989	2 620	2 771	2 821	3 036	2 839	1 630	2 480	4 635	4 672	4 654	5 187	4 898	5 142	3 840	5 404	6 034	5 705	5 521
Belarus	5 954	6 198	5 468	5 509	5 065	4 873	4 128	3 911	3 769	3 708	3 039	3 745	2 414	4 134	4 348	4 854	5 598	5 985	6 150	7 339	6 799	5 505	5 139	5 106	5 443	5 308	5 142	5 351
Belgium	2 687	2 837	2 652	2 190	2 149	1 956	1 893	1 772	1 588	1 648	1 577	1 462	1 335	1 503	1 521	1 380	1 348	1 263	1 203	1 124	1 278	1 321	1 211	1 030	1 128	1 076	1 043	955
Bosnia & Herzegovina	4 421	4 376	4 678	4 468	4 691	4 666	4 605	4 522	4 093	4 176	4 073	3 546	600	680	1 595	2 132	2 220	2 869	2 711	2 923	2 476	2 469	1 691	1 740	2 353	2 111	1 778	2 373
Bulgaria	3 280	3 007	2 999	2 892	2 856	2 555	2 530	2 352	2 387	2 301	2 256	2 606	3 096	3 213	5 296	3 245	3 109	3 437	4 117	3 530	3 349	3 862	3 335	3 069	3 025	3 225	3 136	2 848
Croatia	3 999	4 021	3 718	3 632	3 612	3 605	3 355	3 326	2 973	2 861	2 576	2 158	2 189	2 279	2 217	2 114	2 174	2 054	2 118	1 765	1 630	1 376	1 443	1 356	1 170	1 050	1 029	951
Cyprus	69	69	86	73	39	61	48	35	39	23	29	43	39	37	37	36	24	47	45	39	33	40	20	35	30	34	36	41
Czech Republic	4 962	4 312	4 146	4 016	3 653	3 117	2 553	2 196	2 047	1 905	1 937	2 079	1 986	1 864	1 960	1 834	1 969	1 834	1 805	1 605	1 414	1 291	1 156	1 101	1 027	973	941	790
Denmark	430	394	378	348	302	312	299	322	304	328	350	334	359	411	495	448	484	554	529	587	587	494	403	378	356	395	341	355
Estonia	614	560	563	587	546	541	522	446	471	422	423	406	403	532	623	624	683	744	820	754	791	708	620	557	537	479	422	456
Finland	2 247	2 204	2 170	1 882	1 791	1 819	1 546	1 419	1 078	970	772	771	700	542	553	661	645	573	629	565	527	460	449	392	319	339	280	300
France	17 199	16 459	15 425	13 831	12 302	11 290	10 535	10 241	9 191	9 027	9 030	8 510	8 605	9 551	9 093	8 723	7 656	6 832	5 981	6 052	6 122	5 814	5 709	5 740	5 004	4 887	4 817	5 314
Georgia	2 098	2 124	2 168	1 881	1 855	1 822	1 833	1 810	1 598	1 609	1 537		2 130	3 741		1 625	3 522	8 446	6 302	4 793	4 397	4 006	4 490	4 212	4 011	4 501	4 554	4 310
Germany	29 991	27 083	25 397	22 977	20 243	20 074	17 906	17 102	16 282	15 385	14 653	13 474	14 113	14 161	12 982	12 198	11 814	11 163	10 440	9 974	9 064	6 959	6 931	6 526	6 007	5 539	5 021	4 609
Greece	5 412	7 334	5 193	3 880	1 956	1 556	1 566	1 193	907	1 068	877	762	920			939	945	767	1 152	936	703	503	570	571	668	626	580	593
Hungary	5 412	5 322	5 181	5 028	4 472	4 852	4 522	4 125	4 016	3 769	3 588	3 658	3 960	4 209	4 163	4 339	4 403	4 240	3 999	3 532	3 073	2 923	2 720	2 507	2 251	1 808	1 687	1 540
Iceland	25	23	25	24	26	13	13	12	16	18	18	15	16	11	18	12	11	10	17	10	13	12	8	5	11	10	13	12
Ireland	1 152	1 018	975	924	837	804	602	581	534	672	624	640	604	598	544	458	434	416	424	455	386	393	375	354	380	387	416	425
Israel	249	227	232	222	257	368	239	184	226	160	234	505	345	419	395	398	369	422	656	490	557	546	485	505	497	402	384	392
Italy	3 311	3 182	3 850	4 253	3 472	4 113	4 077	3 278	3 610	3 996	4 246	3 719	4 685	4 734	5 816	5 627	4 155	4 596	5 727	4 429	3 501	4 287	3 925	4 234	3 968	3 828	4 145	2 695
Kazakhstan	14 442	13 876	13 808	13 357	12 563	12 423	13 090	13 286	13 501	13 307	10 969	10 821	10 920	10 425	10 519	11 310	13 944	16 109	20 623	24 979	25 843	26 224	27 546	26 936	26 493	25 739	23 728	24 777
Kyrgyzstan	1 973	2 085	2 051	1 981	2 022	2 094	2 122	2 088	2 159	2 132	2 306	2 515	2 582	2 427	2 726	3 393	4 093	5 189	5 706	6 376	6 205	6 654	6 613	6 172	6 104	6 329	6 174	6 098
Latvia	1 194	1 140	1 077	1 072	1 054	1 223	982	948	938	857	906	943	955	994	1 131	1 541	1 761	2 003	2 182	1 891	1 982	2 000	1 803	1 686	1 579	1 409	1 290	1 227
Lithuania	1 636	1 599	1 495	1 477	1 420	1 453	1 412	1 372	1 339	1 381	1 471	1 556	1 598	1 895	2 135	2 362	2 608	2 926	3 016	2 800	2 657	2 598	2 414	2 586	2 036	2 114	2 365	2 235
Luxembourg	71	45	41	41	46	42	45	48	16	45	48	48	25	35	33	32	41	38	44	37	44	31	31	54	31	37	33	39
Malta	24	26	13	24	15	11	14	14	12	16	13	26	30	26	25	11	28	11	16	22	16	16	24	6	18	21	30	38
Monaco	1	0	0	0	0	1	2	2	1	1	1	0	1		1	1	0	0	0	3	0	0	0					
Montenegro																										156	167	147
Netherlands	1 701	1 734	1 514	1 423	1 400	1 362	1 238	1 227	1 341	1 317	1 369	1 345	1 465	1 587	1 811	1 619	1 678	1 486	1 341	1 398	1 244	1 408	1 355	1 282	1 316	1 127	1 002	930
Norway	499	461	448	396	373	374	343	307	294	255	285	290	288	256	242	236	217	205	244	213	221	276	243	320	278	269	276	282
Poland	25 807	24 087	23 685	23 411	22 527	21 650	20 603	19 757	18 537	16 185	16 136	16 496	16 551	16 828	16 653	15 958	15 358	13 967	13 302	12 168	10 931	10 153	10 069	9 677	8 698	8 203	8 017	8 019
Portugal	6 873	7 249	7 309	7 052	6 908	6 889	6 624	7 099	6 363	6 664	6 214	5 980	5 927	5 447	5 619	5 577	5 248	5 110	5 260	4 599	4 227	4 320	4 381	3 861	3 600	3 303	3 218	2 952
Republic of Moldova	2 781	2 852	3 197	2 858	2 554	2 732	3 022	2 810	2 510	2 281	1 728	1 910	1 835	2 426	2 626	2 925	2 922	2 908	2 625	2 711	2 935	3 608	3 769	3 619	4 806	5 141	4 990	4 857
Romania	13 553	13 602	13 588	13 570	12 952	12 677	12 860	13 361	14 137	14 676	16 256	15 482	18 097	20 349	21 422	23 271	24 189	23 903	25 758	26 107	27 470	28 580	29 752	28 335	28 570	26 104	24 295	22 590
Russian Federation	74 270	73 369	72 236	73 280	74 597	64 644	71 764	70 132	67 553	62 987	50 641	50 407	53 148	63 591	70 822	84 980	111 075	119 123	110 935	134 360	140 677	132 477	128 873	124 041	121 426	127 930	124 689	127 338
San Marino											1	1		3	2	2	0	1	0	0	1	0	1	1	0			
Serbia	6 232	6 381	6 274	6 443	6 454	6 246	6 126	6 042	5 583	5 045	4 194	4 502	3 771	3 843	3 606	2 798	4 017	4 062	3 028	2 646	2 864	4 556	4 232	3 895	3 600	3 208	3 146	2 891
Slovakia	2 465	2 304	2 263	2 252	2 152	1 989	2 022	1 830	1 651	1 501	1 448	1 620	1 733	1 799	1 760	1 540	1 503	1 298	1 282	1 100	1 010	986	975	904	664	710	673	622
Slovenia	1 085	939	982	925	896	923	816	792	760	768	722	583	640	646	526	525	563	481	449	423	368	359	338	275	249	269	207	212
Spain	4 853	5 552	7 961	8 987	10 078	10 749	13 755	9 468	8 497	8 058	7 600	9 007	9 703	9 441		8 764	8 331	9 347	8 927	8 393	7 993	6 851	7 283	7 343	6 015	7 281	7 815	7 347
Sweden	926	875	784	832	754	702	640	545	536	595	557	521	610	616	537	564	497	456	446	479	417	394	375	386	416	539	489	460
Switzerland	1 160	1 193	1 167	1 097	946	961	881	1 018	1 201	1 104	1 278	1 134	987	930	924	830	765	747	750	756	544	539	591	554	528	508	461	425
Tajikistan	2 647	2 631	2 628	2 509	2 427	2 485	2 610	2 727	2 474	2 621	2 460	2 116	1 671	652	892	2 029	1 647	2 143	2 448	2 553	2 779	3 508	4 052	4 260	4 529	5 460	5 362	6 297
TFYR Macedonia													1 602	1 712	728	786	724	693	620	557	641	648	686	653	644	598	561	526
Turkey	36 716	39 992	26 457	28 634	27 589	30 960	31 029	30 531	27 884	26 669	24 468	25 166	25 455			22 981	20 212	25 685	25 501	22 088	18 038	17 263	18 043	17 923	17 543	19 744	19 629	18 878
Turkmenistan	1 677	1 625	1 559	1 541	1 604	1 607	1 614	1 956	1 904	2 169	2 325	2 358	2 074	2 751		1 939	2 072	3 438	3 839	4 092	4 038	3 948	3 671	3 771	3 382	3 191	3 223	3 428
Ukraine	26 095	25 646	24 710	24 216	24 356	24 058	22 946	22 145	20 744	20 182	16 465	16 713	18 140	19 964	20 622	21 459	23 414	28 344	27 763	32 879	32 945	36 784	40 175	37 043	38 403	39 608	41 265	37 517
United Kingdom	10 488	9 290	8 436	7 814	7 026	6 666	6 841	5 732	5 793	6 059	5 908	6 088	6 411	6 481	6 196	6 176	6 238	6 355	6 176	6 183	6 220	6 027	6 889	6 400	7 039	8 173	8 157	7 851
Uzbekistan	9 163	9 682	8 697	8 817	8 544	8 717	9 427	9 794	10 134	10 632	9 414		9 370	9 774	14 890	9 866	11 919	13 352	14 558	15 080	15 750	17 391	20 588	20 700	20 289	21 513	23 900	19 779
EUR	**348 921**	**346 104**	**324 580**	**319 220**	**308 401**	**298 933**	**302 602**	**290 606**	**277 143**	**267 232**	**242 429**	**231 651**	**248 519**	**242 425**	**243 691**	**290 031**	**322 080**	**353 361**	**349 795**	**373 765**	**373 081**	**368 433**	**373 670**	**358 978**	**354 954**	**365 346**	**359 735**	**350 529**
Number reporting	49	49	49	49	49	49	49	49	49	50	51	49	50	48	47	51	52	52	52	52	52	52	52	51	51	51	51	51
% reporting	92	92	92	92	92	92	92	92	92	94	96	92	94	91	89	96	98	98	98	98	98	98	98	96	96	96	96	96

From 1995 on, number shown is all notified new and relapse cases (DOTS and non-DOTS). Figures for all years are updated as new information becomes available, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.14 **TB case notification rates, Europe, 1980–2007**

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Albania	39	35	35	31	34	31	33	29	24	21	20	19			22	20	24	21	22	24	20	18	19	17	17	16	15	14
Andorra										23	44	44	36	25	38		26	29	12	15	18	15	7	14	10	14	16	7
Armenia	24	29	24	22	24	23	24	22	19	18	17	21	7	17	23	36	29	33	47	48	43	45	47	51	55	73	59	56
Austria	29	27	26	24	23	19	18	18	18	17	20	18	17	16	16	18	16	17	16	13	15	12	13	12	11	11	10	10
Azerbaijan	50	51	51	49	53	57	56	53	48	42	36	38	38	40	37	21	31	58	58	58	64	60	62	46	65	72	68	65
Belarus	62	64	56	56	51	49	41	39	37	36	30	36	23	40	42	47	55	59	61	73	68	55	52	52	55	54	53	55
Belgium	27	29	27	22	22	20	19	18	16	17	16	15	13	15	15	14	13	12	12	11	13	13	12	10	11	10	10	9
Bosnia & Herzegovina	113	111	117	111	115	113	110	106	94	96	95	85	15	18	45	62	65	83	76	79	65	64	44	45	60	54	45	60
Bulgaria	37	34	34	32	32	29	28	26	27	26	26	30	36	38	63	39	38	42	51	44	42	49	42	39	39	42	41	37
Croatia	91	91	84	82	81	81	75	74	66	64	57	47	48	49	48	45	47	44	46	39	36	31	32	30	26	23	23	21
Cyprus	11	11	14	12	6	9	7	5	6	3	4	6	6	5	5	5	3	6	6	5	4	5	2	4	4	4	4	5
Czech Republic	48	42	40	39	35	30	25	21	20	18	19	20	19	18	19	18	19	18	18	16	14	13	11	11	10	10	9	8
Denmark	8	8	7	7	6	6	6	6	6	6	7	6	7	8	10	9	9	11	10	11	11	9	8	7	7	7	6	7
Estonia	42	38	38	39	36	35	34	29	30	27	27	26	26	36	43	43	48	53	59	55	58	52	46	41	40	36	31	34
Finland	47	46	45	39	37	37	31	29	22	20	15	15	14	11	11	13	13	11	12	11	10	9	9	8	6	6	5	6
France	32	30	28	25	22	20	19	18	16	16	16	15	15	17	16	15	13	12	10	10	10	10	10	10	8	8	8	9
Georgia	41	42	42	36	35	34	34	34	29	29	28		40	72		32	71	173	131	100	93	86	97	92	89	101	103	98
Germany	38	35	33	30	26	26	23	22	21	19	18	17	18	18	16	15	14	14	13	12	11	8	8	8	7	7	6	6
Greece	56	75	53	39	20	16	16	12	9	11	9	7	9			9	9	7	11	9	6	5	5	5	6	6	5	5
Hungary	51	50	48	47	42	46	43	39	38	36	35	35	38	41	40	42	43	41	39	34	30	29	27	25	22	18	17	15
Iceland	11	10	11	10	11	5	5	5	6	7	7	6	6	4	7	4	4	4	6	4	5	4	3	2	4	3	4	4
Ireland	34	30	28	26	24	23	17	16	15	19	18	18	17	17	15	13	12	11	11	12	10	10	10	9	9	9	10	10
Israel	7	6	6	6	6	9	6	4	5	4	5	11	7	8	8	7	7	7	11	8	9	9	8	8	8	6	6	6
Italy	6	6	7	8	6	7	7	6	6	7	7	7	8	8	10	10	7	8	10	8	6	7	7	7	7	7	7	5
Kazakhstan	97	92	91	87	81	79	82	82	83	81	66	66	66	64	65	71	89	104	135	166	173	176	184	179	175	169	155	161
Kyrgyzstan	54	56	54	51	51	52	52	50	51	49	52	57	58	54	60	74	88	110	119	131	125	133	131	121	118	122	117	115
Latvia	48	45	43	42	41	47	38	36	35	32	34	36	37	39	45	62	72	82	90	79	83	85	77	72	68	61	56	54
Lithuania	48	47	43	42	40	41	39	38	37	38	40	42	43	52	58	65	72	82	85	79	76	75	70	75	59	62	69	66
Luxembourg	19	12	11	11	13	11	12	13	4	12	13	12	6	9	8	8	10	9	10	9	10	7	7	12	7	8	7	8
Malta	7	8	4	7	4	3	4	4	3	4	4	7	8	7	7	3	7	3	4	6	4	4	6	2	4	5	7	9
Monaco	4	0	0	0	0	4	7	7	3	3	3	0	3		3	3	0	0	0	9	0	0	0					
Montenegro																										26	28	25
Netherlands	12	12	11	10	10	9	8	8	9	9	9	9	10	10	12	10	11	9	9	9	8	9	8	8	8	7	6	6
Norway	12	11	11	10	9	9	8	7	7	6	7	7	7	6	6	5	5	5	6	5	5	6	5	7	6	6	6	6
Poland	73	67	65	64	61	58	55	52	49	43	42	43	43	44	43	41	40	36	35	32	28	26	26	25	23	21	21	21
Portugal	70	74	74	71	69	69	66	71	64	67	62	60	59	55	56	56	52	51	52	45	41	42	42	37	34	31	30	28
Republic of Moldova	69	70	78	69	61	65	71	65	58	52	39	43	42	55	60	67	67	68	62	65	71	88	93	91	122	133	130	128
Romania	61	61	61	60	57	56	56	58	61	63	70	67	78	89	94	103	107	106	115	117	124	130	136	130	132	121	113	105
Russian Federation	54	53	51	52	52	45	50	48	46	43	34	34	36	43	47	57	75	80	75	91	95	90	88	85	84	89	87	89
San Marino											4	4		12	8	8	0	4	0	0	4	0	4	3	0			
Serbia	65	66	65	66	66	63	62	61	56	50	41	44	36	36	34	26	37	37	28	24	27	42	40	37	34	33	32	29
Slovakia	50	46	45	44	42	39	39	35	32	29	28	31	33	34	33	29	28	24	24	20	19	18	18	17	12	13	12	12
Slovenia	59	51	53	50	48	49	43	42	40	40	37	30	33	33	27	27	29	24	23	21	19	18	17	14	12	13	10	11
Spain	13	15	21	24	26	28	36	25	22	21	20	23	25	24		22	21	24	23	21	20	17	18	17	14	17	18	17
Sweden	11	11	9	10	9	8	8	6	6	7	7	6	7	7	6	6	6	5	5	5	5	4	4	4	5	6	5	5
Switzerland	18	19	18	17	15	15	13	15	18	16	19	16	14	13	13	12	11	10	10	10	7	7	8	8	7	7	6	6
Tajikistan	67	65	63	58	55	54	55	56	49	51	46	39	30	12	16	35	28	36	41	42	45	56	64	67	70	83	81	93
TFYR Macedonia													83	88	37	40	37	35	31	28	32	32	34	32	32	29	28	26
Turkey	79	84	54	57	54	59	58	56	50	47	43	43	43			37	32	40	39	33	26	25	26	25	24	27	27	25
Turkmenistan	59	55	52	50	51	50	49	58	55	61	63	62	53	69		46	49	79	87	92	90	86	79	80	71	66	66	69
Ukraine	52	51	49	48	48	47	45	43	40	39	32	32	35	39	40	42	46	56	56	67	67	76	84	78	81	84	89	81
United Kingdom	19	16	15	14	12	12	12	10	10	11	10	11	11	11	11	11	11	11	11	11	11	10	12	11	12	14	13	13
Uzbekistan	57	59	52	51	48	48	51	51	52	53	46		44	44	66	43	51	56	61	62	64	69	81	80	77	81	89	72
EUR	**44**	**43**	**40**	**39**	**38**	**36**	**36**	**35**	**33**	**32**	**29**	**27**	**29**	**28**	**28**	**33**	**37**	**41**	**40**	**43**	**43**	**42**	**43**	**41**	**40**	**41**	**41**	**39**

Rates are per 100 000 population. From 1995 on, number shown is notification rate of new and relapse cases. Figures for all years are updated as new information becomes available and/or techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.15 **New smear-positive cases notified, Europe, 1990–2007**

	Number of cases																		Rate (per 100 000 population)																				
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Albania					250	139	173	241	212	168	171	171	225	211	201	196	186	165					8	4	6	8	7	5	6	6	7	7	6	6	6	5
Andorra				15	24		8	17	1	4	1	3	2	7	3	5	8	2				25	38		12	26	2	6	2	4	3	10	4	7	11	3
Armenia					319	436	327	400	475	576	621	572	511	575	602	581	580	497					10	14	10	13	15	19	20	19	17	19	20	19	19	17
Austria						467	442	434	381	323	324	262	220	269	216	234	213	189					6	5	5	5	4	4	3	3	3	3	3	3	3	2
Azerbaijan				499	513	669	990	981	727	763	890	927	1 661	1 161	1 472	1 561	1 454	1 356				7	7	9	13	12	9	9	11	11	20	14	18	19	17	16
Belarus				1 493	1 775	1 845	2 117	2 273	5 047	2 769	2 547	2 341		1 018	1 109	1 235	1 072	1 051				15	17	18	21	22	50	27	25	23		10	11	13	11	11
Belgium				484	427	400	364	434	418	403	409	472	419	362	391	380	343	322				5	4	4	4	4	4	4	4	5	4	4	4	4	3	3
Bosnia & Herzegovina						865	927	803	640	786	759	800	526	493	889	640	562	737						25	27	23	18	21	20	21	14	13	23	16	14	19
Bulgaria					3 096	1 087	903	1 037	1 325	1 697	2 524	897	1 007	1 254	1 315	1 214	1 307	1 080					37	13	11	13	16	21	32	11	13	16	17	16	17	14
Croatia						1 204	1 228	1 073	1 129	748	0	421	437	438	416	372	396	382						26	26	23	25	17	0	9	10	10	9	8	9	8
Cyprus						6	3	19	20	9	4	0	8	14	10	9	8	8						1	0	3	3	1	1	0	1	2	1	1	1	1
Czech Republic				548	524	487	586	481	545	449	420	391	329	338	302	308	257	267				5	5	5	6	5	5	4	4	4	3	3	3	3	3	3
Denmark				243	120	128	97	114	132	172	171	127	135	143	146	129	123	135				5	2	2	2	2	2	3	3	2	3	3	3	2	2	2
Estonia				303	347	369	240	269	299	274	255	212	203	201	203	162	147	168				20	24	26	17	19	22	20	19	16	15	15	15	12	11	13
Finland						244	240	186	188	179	205	150	130	138	124	130	84	85						5	5	4	4	3	4	3	2	3	2	2	2	2
France				4 455	3 196	3 449	3 002	2 430		2 325	1 815	2 398	2 276	2 219	1 923	1 941	1 911	1 921				8	6	6	5	4		4	3	4	4	4	3	3	3	3
Georgia						221	482	595	547	746	601	1 014	987	989	1 311	1 509	1 831	1 867						4	10	12	11	16	13	22	21	22	29	34	41	42
Germany				4 730	4 177	3 852	3 689	3 346	3 124	2 918	0	1 935	1 868	1 679	1 562	1 379	1 303	1 183				6	5	5	5	4	4	4	0	2	2	2	2	2	2	1
Greece								285	313	143	235	213	212	234	176	197	210	257								3	3	1	2	2	2	2	2	2	2	2
Hungary				1 905	1 357	796	1 066	702	667	660	412	546	556	526	560	423	422	381				18	13	8	10	7	6	6	4	5	5	5	6	4	4	4
Iceland					6	2	1	4	2	2	1	3	2	1	2	2	4	2					2	1	0	1	1	1	0	1	1	0	1	1	1	1
Ireland							339	123	116	117	138	123	100	141	127	130	133	135							9	3	3	3	4	3	3	4	3	3	3	3
Israel				150	129		147	207	221	170	17	172	164	150	91	98	72	143				3	2		3	4	4	3	0	3	3	2	1	1	1	2
Italy					1 441	1 413	1 738	1 903	2 361	1 277	687	1 361	1 275	1 481	1 058	1 275	1 377	979					3	2	3	3	4	2	1	2	2	3	2	2	2	2
Kazakhstan						3 022	4 290	4 332	6 180	6 977	8 903	9 079	9 452	8 665	7 927	6 911	6 205	6 195						19	27	28	41	46	60	61	63	58	52	45	41	40
Kyrgyzstan					681	832	991	1 536	830	1 642	1 296	0	1 587	1 643	1 761	1 972	1 833	1 720					15	18	21	33	17	34	26	0	31	32	34	38	35	32
Latvia				470		504	575	634	668	588	637	661	636	641	582	536	498	478				18		20	23	26	28	25	27	28	27	28	25	23	22	21
Lithuania				688		979	1 121	1 200	787	787	776	935	822	912	863	964	1 029	925				19		27	31	34	22	22	22	27	24	26	25	28	30	27
Luxembourg							29	31	24		21	11	17	31	20	14	22	0							7	7	6		5	2	4	7	4	3	5	0
Malta				13	6	5	5	3	6	9	5	3	5	2	2	5	4	8				4	2	1	1	1	2	2	1	1	1	1	0	1	1	2
Monaco							0	0	0	2	0	0	0												0	0	0	6	0	0	0					
Montenegro																64	58	41																11	10	7
Netherlands				1 063		575	358	312	254	308	289	307	330	282	360	237	203	187				7		4	2	2	2	2	2	2	2	2	2	1	1	1
Norway					86	62	103	100	49	21	37	59	31	52	50	48	46	38					2	1	2	2	1	0	1	1	1	1	1	1	1	1
Poland				7 606	4 000	6 955	6 819	3 497	3 502	3 177	3 180	3 155	3 060	2 983	2 777	2 823	2 835	2 827				20	10	18	18	9	9	8	8	8	8	8	7	7	7	7
Portugal					2 072	2 019	1 938	1 628	2 016	1 801	1 863	2 042	1 976	1 742	1 514	1 302	1 300	1 173					21	20	19	16	20	18	18	20	19	17	14	12	12	11
Republic of Moldova				615	704	665	219	397	477	609	651	1 060	1 146	1 214	1 536	1 696	1 679	1 610				14	16	15	5	9	11	14	16	26	28	31	39	44	44	42
Romania				9 339	10 385	10 469	10 359	11 666	10 841	10 317	10 202	11 184	10 703	10 418	10 888	10 801	9 814	9 425				41	46	46	46	52	49	46	46	51	49	48	50	50	46	44
Russian Federation					30 389	37 512	42 534	42 094	42 219	21 744	27 467	26 605	27 865	28 868	30 890	32 605	32 335	33 103					20	25	29	28	28	15	19	18	19	20	21	23	23	23
San Marino							0	1	0	0	1	0	0	0	0										0	4	0	0	4	0	0	0	0			
Serbia						1 497	1 783	1 702	1 873	2 517	0	461	402	611	1 244	1 105	1 136	1 146						14	16	16	17	23	0	4	4	6	12	11	12	12
Slovakia				882	409	788	760	283	303	246	236	226	202	200	157	162	160	176				17	8	15	14	5	6	5	4	4	4	4	3	3	3	3
Slovenia				361	294	303	221	156	157	165	145	139	130	116	89	109	83	90				19	15	15	11	8	8	8	7	7	7	6	4	5	4	4
Spain						2 605			1 906		3 423	2 456	3 317	2 876	2 082	2 511	2 006	2 317						7			5		9	6	8	7	5	6	5	5
Sweden				312	106	102	90	94	97	117	118	105	109	109	120	134	106	96				4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Switzerland				528	507	185	172	144	165	98	118	116	123	107	119	108	112	95				8	7	3	2	2	2	1	2	2	2	1	2	1	2	1
Tajikistan						1 042	232	373	435	0	434	719	687	0	1 058	1 745	2 051	2 228						18	4	6	7	0	7	12	11	0	16	27	31	33
TFYR Macedonia						319	209	192	179	122	167	164	200	200	200	178	178	200						16	11	10	9	6	8	8	10	10	10	9	9	10
Turkey						4 383	2 816	3 439	3 692	4 124	4 315	4 444	0	5 816	5 870	7 450	7 866	7 527						7	4	5	6	6	6	6	0	8	8	10	11	10
Turkmenistan				472		544	557	764	790	964	1 017	1 243	1 254	1 197	1 103	995	1 155	1 378				12		13	13	18	18	22	23	27	27	25	23	21	24	28
Ukraine				8 314	8 471	8 263	7 827	9 533	10 586	10 412	10 738	0	0	12 785	0		14 206	11 028				16	17	16	15	19	21	21	22	0	0	27	0		31	24
United Kingdom				283	270		4 147	844	1 342	797	1 204	946	1 365	1 455	1 693	1 821	1 767	1 639				0	0		7	1	2	1	2	2	2	2	3	3	3	3
Uzbekistan					7 487	2 735	3 350	3 388	3 504	3 977	3 825	4 608	4 783	4 690	5 119	5 695	7 211	6 326					33	12	14	14	15	16	15	18	19	18	20	21	27	23
EUR				**45 771**	**83 568**	**104 444**	**110 614**	**106 700**	**111 772**	**89 199**	**94 275**	**86 239**	**83 455**	**101 657**	**92 233**	**96 101**	**109 901**	**105 288**				**5**	**10**	**12**	**13**	**12**	**13**	**10**	**11**	**10**	**9**	**12**	**10**	**11**	**12**	**12**

Rates are per 100 000 population. Figures for all years are updated as new information becomes available and/or techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.16 **NTP budgets, available funding, cost of utilization of general health-care services and total TB control costs (US$ millions), Europe, 2009**

	NTP budget	Available funding: Government (excluding loans)	Available funding: Loans	Available funding: Grants (excluding Global Fund)	Available funding: Global Fund	Funding gap	Cost of utilization of general health-care services	Total TB control costs	Completeness of budget data
Albania									N
Andorra	0.1	0.1	0	0	0	0		0.1	P
Armenia	0	0	0	1.1	1.4	< 0.01	0.1	0.1	P
Austria									N
Azerbaijan									N
Belarus									N
Belgium									N
Bosnia & Herzegovina									N
Bulgaria	15	10	0	0	4.4	0	5.0	20	C
Croatia									N
Cyprus	0.04	0.04	0	0	0	0	0.1	0.2	C
Czech Republic							0.2	0.2	N
Denmark							849	849	N
Estonia	1.0	1.0	0	0	0	0	0.6	1.6	C
Finland									N
France									N
Georgia	18	6.9	0	1.0	10	0	0.7	19	C
Germany									N
Greece									N
Hungary									N
Iceland									N
Ireland									N
Israel									N
Italy									N
Kazakhstan	384	84	0	0.02	2.0	298	14	398	C
Kyrgyzstan									N
Latvia	30	0	0	0	0	30	2.5	33	P
Lithuania									N
Luxembourg									N
Malta	0.1	0.1	0	0	0	0	< 0.01	0.1	C
Monaco									N
Montenegro	0	0	0	0.1	0.1	< 0.01		0	P
Netherlands	49	49	0	0	0	0	0.9	50	C
Norway									N
Poland									N
Portugal	7.4	7.4	0	0	0	0	2.4	9.8	C
Republic of Moldova	18	16	0	0.1	1.8	0	1.0	19	C
Romania	18	16	0	0	1.5	0.5	12	30	C
Russian Federation	1249	1014	0	1.4	6.9	226	24	1273	C
San Marino									N
Serbia	23	20	0	0	0.7	2.2	0.4	23	C
Slovakia	0.02	0.02	0	0	0	0	0.6	0.6	
Slovenia									C
Spain									N
Sweden									N
Switzerland	4.0	2.7	0	1.3	1.4	0	0.1	4.1	N
Tajikistan									C
TFYR Macedonia	1.2	0.6	0	0	0.5	0.04	0.3	1.5	N
Turkey	70	70	0	0	0	0	10	80	C
Turkmenistan									C
Ukraine									N
United Kingdom									N
Uzbekistan	33	30	0	3.7	3.7	0	62	96	N
EUR	**1 921**	**1 328**	**0**	**9**	**35**	**555**	**986**	**2 907**	**31%**

N indicates data not available or not applicable; P indicates partial financial data; C indicates complete data and therefore included in analysis presented in chapter 3. Completeness of budget data in total row indicates percentage of countries providing complete financial data. Data can be downloaded from www.who.int/tb

Notes

Denmark

Data for Denmark exclude Greenland. A total of 54 TB cases were notified in Greenland for 2007 (93 per 100 000 population). No MDR-TB cases were identified in Greenland.

Russian Federation

TABLE A3.5: cases notified as "Other re-treatment" in 2007 included smear-negative cases; these cases were not notified in previous years.

SOUTH-EAST ASIA

South-East Asia

NTP MANAGER (OR EQUIVALENT) AND/OR PERSON(S) RESPONSIBLE FOR COMPLETING DATA COLLECTION FORM

Bangladesh	Mohammed Abdul Awal Miah; Roksana Hafiz
Bhutan	Chewang Rinzin
DPR Korea	Kim Jong Guk; Hong Sung Il
India	L.S. Chauhan
Indonesia	Jane Soepardi; Sudarman Soemrah
Maldives	Shameema Hussain; Fathmeth Reeza
Myanmar	Win Maung; Thandar Lwin
Nepal	Pushpa Malla; Badri Nath Jnawali
Sri Lanka	Chandra Sarukkali
Thailand	Yutichai Kasetjaroen; Pinan Daengharn; Sirinapha Jittimanee
Timor-Leste	Constantino Lopes

This list shows the people named on the data collection form sent to WHO in 2008, not necessarily the current NTP manager. It is intended as an acknowledgement rather than a directory.

Table A3.1 **Methods and assumptions for estimation of TB incidence, prevalence and mortality, South-East Asia**

	Reference year	Incidence est. based on	Trend	Source of estimates			Cfr ss+ HIV-		Duration ss+HIV-		Duration ss-HIV-	
				TB/HIV	MDR (new)	MDR (re-treat)	DOTS	non-DOTS	DOTS	non-DOTS	DOTS	non-DOTS
Bangladesh	1997	Prev.	ARI	Indirect	Model	Model	0.1	0.3	1	2.5	1	2.5
Bhutan	1997	ARI	Country notifs, exp.	Indirect	Model	Model	0.1	0.2	1	2.5	1	2.5
DPR Korea	2007	ARI	Not estimated	Indirect	Model	Model	0.1	0.3	1	2.5	1	2.5
India	2002	ARI	Not estimated	Indirect	DRS	DRS	0.1	0.3	0.8	2.65	1.8	3.8
Indonesia	2004	Prev.	Expert opinion	Indirect	DRS	Model	0.1	0.3	0.8	1.12	0.8	1.12
Maldives	1997	Notif.	Country notifs, exp.	Routine	Model	Model	0.05	0.2	0.8	2.5	0.8	2.5
Myanmar	1997	ARI	Not estimated	Sentinel	DRS	DRS	0.1	0.3	1	2.5	1	2.5
Nepal	1997	Prev.	ARI	Sentinel	DRS	DRS	0.05	0.2	1	2.5	1	2.5
Sri Lanka	1997	Notif.	Not estimated	Sentinel	DRS	Model	0.1	0.3	1	2.5	1	2.5
Thailand	1997	Prev.	Not estimated	Survey	DRS	DRS	0.1	0.2	1	2.5	1	2.5
Timor-Leste	2007	Comparison	Not estimated	Indirect	Model	Model	0.1	0.2	1	2	1	2

– indicates no estimate; ARI, annual risk of infection; ave, average; C-ReC., capture re-capture; CDR, case detection rate; DRS, drug resistance survey; exp., exponential; HIV+, HIV-positive; HIV-, HIV-negative; Mort., mortality (vital registration); Notif(s)., notification(s); Prev., disease prevalence survey; ss+, sputum smear-positive; ss-, sputum smear-negative. See Annex 2 (methods) for details. Data can be downloaded from www.who.int/tb

Table A3.2 **Estimated burden of TB, South-East Asia, 1990 and 2007**

	Incidence, 1990				Prevalence, 1990		TB mortality, 1990		Incidence, 2007								Prevalence, 2007				TB mortality, 2007				HIV prevalence in incident TB	MDR, 2007			
	All forms*		Smear-positive*		All forms*		All forms*		All forms*		All forms HIV+		Smear-positive*		Smear-positive HIV+		All forms*		All forms HIV+		All forms*		All forms HIV+			Percentage of		Number among	
	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	cases, 2007 (%)	new	re-treat	all cases	smear-positive
Bangladesh	298 205	264	134 192	119	721 902	639	87 087	77	353 103	223	995	< 1	158 797	100	348	< 1	613 652	387	498	< 1	70 901	45	421	< 1	0	3.5	20	14 506	7 694
Bhutan	2 955	540	1 330	243	5 057	924	550	101	1 620	246	28	4	726	110	10	1	2 390	363	14	2	288	44	8	1	1.7	3.0	20	67	41
DPR Korea	69 382	344	31 222	155	169 458	841	22 830	113	81 944	344	174	< 1	36 857	155	61	< 1	104 953	441	87	< 1	15 409	65	49	< 1	0.2	3.9	23	7 183	5 407
India	1 443 567	168	649 377	75	5 044 476	586	360 835	42	1 961 825	168	103 068	9	872 514	75	36 074	3	3 304 976	283	51 534	4	331 268	28	29 508	3	5.3	2.8	17	130 526	99 639
Indonesia	626 867	343	282 090	154	809 592	443	168 956	92	528 063	228	15 996	7	236 029	102	5 599	2	565 614	244	7 998	3	91 368	39	5 444	2	3.0	2.0	20	12 209	6 427
Maldives	278	129	125	58	308	143	16	7	143	47	1	< 1	64	21	< 1	< 1	147	48	< 1	< 1	12	4	< 1	< 1	0.8	2.7	21	5	3
Myanmar	68 616	171	30 503	76	165 017	411	20 958	52	83 403	171	9 114	19	36 620	75	3 190	7	78 846	162	4 557	9	6 297	13	911	2	11	4.0	16	4 181	2 331
Nepal	46 445	243	20 893	109	120 250	629	9 712	51	48 766	173	1 175	4	21 827	77	411	1	67 546	240	588	2	6 436	23	268	< 1	2.4	2.9	12	1 937	1 164
Sri Lanka	10 353	60	4 659	27	18 614	109	1 724	10	11 676	60	9	< 1	5 253	27	3	< 1	15 322	79	5	< 1	1 504	8	2	< 1	0.1	0.2	21	152	141
Thailand	77 232	142	33 862	62	182 330	336	16 047	30	90 878	142	15 481	24	39 347	62	5 418	8	122 826	192	7 741	12	13 589	21	3 853	6	17	1.7	35	2 774	1 923
Timor-Leste	2 383	322	1 073	145	5 225	706	538	73	3 718	322	< 1	< 1	1 673	145	< 1	< 1	4 371	378	< 1	< 1	544	47	< 1	< 1	< 0.05	2.9	20	118	58
SEAR	**2 646 286**	**202**	**1 189 326**	**91**	**7 242 230**	**554**	**689 251**	**53**	**3 165 139**	**181**	**146 042**	**8**	**1 409 708**	**81**	**51 115**	**3**	**4 880 642**	**280**	**73 021**	**4**	**537 616**	**31**	**40 465**	**2**	**4.6**	**2.8**	**18**	**173 660**	**124 826**

– Indicates no estimate.

* Incidence, prevalence and mortality estimates include patients with HIV. Estimates labelled "HIV+" are estimates of HIV+ TB cases in all people. Estimates for all years are re-calculated as new information becomes available and techniques are refined, so they may differ from those published previously. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.3 **Estimated incidence of TB (all forms) in all people, South-East Asia, 1990–2007**

	Number of cases																		Rate (per 100 000 population)																	
	1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Bangladesh	298 205	302 065	305 909	309 695	313 372	316 904	320 270	323 486	326 605	329 697	332 806	335 951	339 104	342 211	345 197	348 013	350 641	353 103	264	261	259	256	253	251	248	246	244	241	239	236	234	232	229	227	225	223
Bhutan	2 955	2 807	2 633	2 455	2 297	2 172	2 082	2 018	1 973	1 935	1 899	1 864	1 832	1 798	1 761	1 719	1 671	1 620	540	516	492	470	449	428	409	391	373	356	340	325	310	296	283	270	258	246
DPR Korea	69 382	70 452	71 556	72 669	73 758	74 796	75 778	76 704	77 562	78 342	79 037	79 641	80 159	80 602	80 992	81 343	81 659	81 944	344	344	344	344	344	344	344	344	344	344	344	344	344	344	344	344	344	344
India	1 443 567	1 474 771	1 506 338	1 538 106	1 569 868	1 601 462	1 632 821	1 663 943	1 694 808	1 725 418	1 755 777	1 785 851	1 815 627	1 845 155	1 874 508	1 903 739	1 932 852	1 961 825	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168
Indonesia	626 867	621 961	616 801	611 432	605 907	600 266	594 523	588 686	582 785	576 852	570 906	564 955	558 989	552 983	546 901	540 720	534 439	528 063	343	335	327	319	311	304	297	290	283	276	270	263	257	251	245	239	234	228
Maldives	278	270	262	254	246	237	228	220	211	202	194	186	178	170	163	156	149	143	129	121	114	108	102	96	90	85	80	75	71	67	63	59	56	53	50	47
Myanmar	68 616	69 685	70 722	71 733	72 731	73 722	74 712	75 695	76 655	77 569	78 422	79 207	79 933	80 620	81 296	81 983	82 687	83 403	171	171	171	171	171	171	171	171	171	171	171	171	171	171	171	171	171	171
Nepal	46 445	46 666	46 907	47 158	47 409	47 649	47 877	48 093	48 288	48 452	48 581	48 670	48 724	48 753	48 766	48 772	48 772	48 766	243	238	233	229	224	220	216	211	207	203	199	195	191	187	184	180	176	173
Sri Lanka	10 353	10 481	10 605	10 724	10 836	10 938	11 031	11 116	11 191	11 260	11 321	11 377	11 426	11 473	11 519	11 568	11 620	11 676	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
Thailand	77 232	78 166	79 086	79 999	80 912	81 829	82 756	83 689	84 607	85 483	86 300	87 048	87 735	88 378	89 002	89 625	90 252	90 878	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142
Timor-Leste	2 383	2 462	2 553	2 641	2 706	2 738	2 726	2 681	2 628	2 604	2 636	2 732	2 885	3 072	3 263	3 437	3 586	3 718	322	322	322	322	322	322	322	322	322	322	322	322	322	322	322	322	322	322
SEAR	**2 646 286**	**2 679 787**	**2 713 371**	**2 746 866**	**2 780 040**	**2 812 714**	**2 844 806**	**2 876 331**	**2 907 313**	**2 937 815**	**2 967 878**	**2 997 483**	**3 026 592**	**3 055 214**	**3 083 367**	**3 111 072**	**3 138 330**	**3 165 139**	**202**	**201**	**199**	**198**	**196**	**195**	**194**	**192**	**191**	**190**	**189**	**188**	**187**	**185**	**184**	**183**	**182**	**181**

Estimates for all years are re-calculated as new information becomes available and techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.4 **Estimated incidence, prevalence and mortality rates (per 100 000 population), South-East Asia, 2000–2007**

	Incidence of HIV+ TB cases								Prevalence of TB (all forms)								Mortality (excluding HIV+)								Mortality HIV+							
	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Bangladesh	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	500	491	478	458	444	416	392	387	58	57	55	53	51	48	45	44	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Bhutan	< 1	< 1	< 1	< 1	1	3	4	4	515	512	472	460	443	412	406	363	60	58	55	53	50	48	46	43	< 1	< 1	< 1	< 1	< 1	< 1	1	1
DPR Korea	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	713	650	577	527	499	508	500	441	105	98	90	86	82	84	83	65	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
India	11	11	11	10	10	10	9	9	443	411	389	349	311	299	290	283	38	35	34	31	28	27	26	26	5	5	4	4	3	3	3	3
Indonesia	2	3	4	4	5	6	6	7	326	314	297	287	274	261	251	244	61	58	53	50	45	41	38	37	< 1	1	1	2	2	2	2	2
Maldives	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	96	84	83	69	71	63	69	48	7	7	6	5	5	5	5	4	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Myanmar	23	23	23	22	21	21	20	19	267	238	202	175	168	161	161	162	32	30	26	20	16	11	11	11	10	9	7	3	3	2	2	2
Nepal	4	4	4	4	4	4	4	4	312	304	285	271	260	247	246	240	28	27	26	24	23	23	22	22	1	1	1	1	< 1	< 1	< 1	< 1
Sri Lanka	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	107	99	88	89	87	75	80	79	10	9	9	9	9	7	8	8	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Thailand	28	27	26	25	25	25	24	24	223	194	197	189	188	184	189	192	17	15	15	15	15	15	15	15	8	7	7	6	6	6	6	6
Timor-Leste	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	644	644	345	359	367	370	385	378	70	70	37	45	46	46	48	47	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
SEAR	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**8**	**417**	**390**	**370**	**337**	**309**	**296**	**286**	**280**	**42**	**40**	**38**	**35**	**32**	**30**	**29**	**28**	**4**	**4**	**4**	**3**	**3**	**3**	**2**	**2**

Rates are per 100 000 population (total country population, including HIV-positive and HIV-negative people). Estimates for all years are re-calculated as new information becomes available and techniques are refined, so they may differ from those published previously. Data (including for years 1990 to 1999) can be downloaded from www.who.int/tb

Table A3.5 **Case notifications and case detection rates, DOTS and non-DOTS combined, South-East Asia, 2007**

	Notified TB cases, DOTS and non-DOTS combined															Estimated incidence and case detection rates				Proportions			
					New pulmonary			New extra-	Other	Re-treatment cases					New pulm.	Estimated incidence		Case detection rate		ss+	ss+	Extrapulm.	Re-treat.
	Population	All notified	New and relapse		ss+		ss- / unk.	pulmonary	new	Relapse	After failure	After default	Other re-treat.	Other	lab. confirm.	all forms	ss+	all new	new ss+	(% of	(% of	(% of	(% of
	thousands	number	number	rate	number	rate	number	number	number	number	number	number	number	number	number	number	number	%	%	pulm.)	new+relapse)	new+relapse)	new+re-treat.)
Bangladesh	158 665	147 342	147 342	93	104 296	66	23 152	16 106	0	3 788					104 296	353 103	158 797	41	66	82	71	11	3
Bhutan	658	1 008	999	152	328	50	253	373		45	6	3			328	1 620	726	59	45	56	33	37	5
DPR Korea	23 790	68 177	58 802	247	23 575	99	25 789	7 579		1 859	2 414	1 418	5 543		23 575	81 944	36 857	69	64	48	40	13	16
India	1 169 016	1 475 629	1 295 943	111	592 587	51	398 862	206 840	798	96 856	19 041	77 618	83 027	0	592 587	1 961 825	872 514	61	68	60	46	16	19
Indonesia	231 627	275 660	275 193	119	160 617	69	102 613	8 048		3 915	104	321	42		160 617	528 063	236 029	51	68	61	58	3	2
Maldives	306	129	127	42	59	19	37	30	0	1	0	0	2	0	59	143	64	88	92	61	46	24	2
Myanmar	48 798	133 547	129 081	265	42 588	87	41 826	40 002		4 665	1 250	748	2 468			83 403	36 620	149	116	50	33	31	7
Nepal	28 196	33 439	32 940	117	14 355	51	9 350	6 986	0	2 249	230	269	0	0	14 355	48 766	21 827	63	66	61	44	21	8
Sri Lanka	19 299	9 155	8 718	45	4 528	23	1 985	1 984	0	221	76	141	0	220	5 262	11 676	5 253	73	86	70	52	23	5
Thailand	63 884	54 793	54 793	86	28 487	45	17 156	7 485		1 665					28 487	90 878	39 347	58	72	62	52	14	3
Timor-Leste	1 155	3 270	3 255	282	1 021	88	1 772	433	0	29	10	5	0	0	1 021	3 718	1 673	87	61	37	31	13	1
SEAR	**1 745 394**	**2 202 149**	**2 007 193**	**115**	**972 441**	**56**	**622 795**	**295866**	**798**	**115 293**	**23 131**	**80 523**	**91 082**	**220**	**930 587**	**3 165 139**	**1 409 708**	**60**	**69**	**61**	**48**	**15**	**14**

ss+ indicates sputum smear-positive; ss-, sputum smear-negative; unk., sputum smear result unknown; re-treat., re-treatment; pulm. lab. confirmed, pulmonary case confirmed by positive smear or culture. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.6 **DOTS coverage, case notifications and case detection rates, South-East Asia, 2007**

		TB cases reported from DOTS services														Estimated incidence and case detection rate				Proportions			
	DOTS			New pulmonary			New extra-	Other	Re-treatment cases					New pulm.	Estimated incidence		DOTS case detection rate		ss+	ss+	Extrapulm.	Re-treat.
	coverage	New and relapse		ss+		ss- / unk.	pulmonary	new	Relapse	After failure	After default	Other re-treat.	Other	lab. confirm.	all forms	ss+	all new	new ss+	(% of	(% of	(% of	(% of
	%	number	rate	number	rate	number	number	number	number	number	number	number	number	number	number	number	%	%	pulm.)	new+relapse)	new+relapse)	new+re-treat.)
Bangladesh	100	147 342	93	104 296	66	23 152	16 106	0	3 788					104 296	353 103	158 797	41	66	82	71	11	3
Bhutan	100	999	152	328	50	253	373		45	6	3			328	1 620	726	59	45	56	33	37	5
DPR Korea	100	58 802	247	23 575	99	25 789	7 579		1 859	2 414	1 418	5 543		23 575	81 944	36 857	69	64	48	40	13	16
India	100	1 295 943	111	592 587	51	398 862	206 840	798	96 856	19 041	77 618	83 027	0	592 587	1 961 825	872 514	61	68	60	46	16	19
Indonesia	100	275 193	119	160 617	69	102 613	8 048		3 915	104	321	42		160 617	528 063	236 029	51	68	61	58	3	2
Maldives	100	127	42	59	19	37	30	0	1	0	0	2	0	59	143	64	88	92	61	46	24	2
Myanmar	95	129 081	265	42 588	87	41 826	40 002		4 665	1 250	748	2 468			83 403	36 620	149	116	50	33	31	7
Nepal	100	32 940	117	14 355	51	9 350	6 986	0	2 249	230	269	0	0	14 355	48 766	21 827	63	66	61	44	21	8
Sri Lanka	98	8 636	45	4 477	23	1 966	1 975	0	218	76	138	0	218	5 211	11 676	5 253	72	85	69	52	23	5
Thailand	100	54 793	86	28 487	45	17 156	7 485		1 665					28 487	90 878	39 347	58	72	62	52	14	3
Timor-Leste	100	3 255	282	1 021	88	1 772	433	0	29	10	5	0	0	1 021	3 718	1 673	87	61	37	31	13	1
SEAR	**100**	**2 007 111**	**115**	**972 390**	**56**	**622 776**	**295 857**	**798**	**115 290**	**23 131**	**80 520**	**91 082**	**218**	**930 536**	**3 165 139**	**1 409 708**	**60**	**69**	**61**	**48**	**15**	**14**

ss+ indicates sputum smear-positive; ss-, sputum smear-negative; unk., sputum smear result unknown; re-treat., re-treatment; pulm. lab. confirmed, pulmonary case confirmed by positive smear or culture. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.7 **Laboratory services, collaborative TB/HIV activities and management of MDR-TB, South-East Asia, 2006–2007**

	Laboratory services, 2007				Collaborative TB/HIV activities								Management of MDR-TB, 2007				
					2006				2007								
	Number of labs working with NTP			Smear labs included	TB pts tested for	TB pts	HIV+ TB pts	HIV+ TB pts	TB pts tested for	TB pts	HIV+ TB pts	HIV+ TB pts	Lab-confirmed	DST	MDR	Re-treatment	Re-treatment
	smear	culture	DST	in EQA	HIV	HIV-positive	CPT	ART	HIV	HIV-positive	CPT	ART	MDR	in new cases	in new cases	DST	MDR
Bangladesh	753	4	2	753													
Bhutan	28	1	1		0	0	0	3	0	0	0	2	0	0	0	0	0
DPR Korea	245			245													
India	12 184	11	11	11 386	59 654	8 785			80 425	9 324	724	162	146	0	0	414	146
Indonesia	4 855	41	11	4 855	243	151			288	146							
Maldives	70	1	0	7									1	2	1	0	0
Myanmar	324	2	1	54	2 626	5 552	664	282	2 825	873	846	437	600				
Nepal	414	3	2	0	0	0	0	0	0	0	0	0	163	721	29	473	134
Sri Lanka	176	1	1	31	343	1	5	5	590	2	6	5	8	926	1	388	7
Thailand	1 023	65	14	1 023	26 552	7 141	4 551	2 260	37 744	7 615	5 080	2 456					
Timor-Leste	18	0	0	18			0	0		4	4						
SEAR	**20 090**	**129**	**43**	**18 372**	**89 418**	**21 630**	**5 220**	**2 550**	**121 872**	**17 964**	**6 660**	**3 062**	**918**	**1 649**	**31**	**1 275**	**287**

ART indicates antiretroviral therapy; CPT, co-trimoxazole preventive therapy; DST, drug susceptibility testing; EQA, external quality assurance; HIV+, HIV-positive; pts, patients. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.8 **Treatment outcomes, South-East Asia, 2006 cohort**

	New smear-positive cases, DOTS											New smear-positive cases, non-DOTS										Smear-positive re-treatment cases, DOTS								
	Number of cases		% of notif	% of cohort							%	Number of cases		% of notif	% of cohort						%	Number	% of cohort							%
	Notified	Regist'd	regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	Success	Notified	Regist'd	regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	Success	Regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	Success
Bangladesh	101 967	101 761	100	91	1	3	1	2	2	1	92												4 211	70	7	5	2	4	4	8	77
Bhutan	312	320	103	80	9	5	1	1		5	89												61	62	13	2	7	0	0	16	75
DPR Korea	18 435	18 435	100	82	4	3	4	4	3	0	86												8 820	68	8	4	13	4	3	0	77
India	553 797	553 302	100	84	2	5	2	6	1	0	86	54											259 130	45	26	7	4	15	2	0	72
Indonesia	175 320	175 320	100	83	9	2	1	5	2	0	91												4 227	61	16	5	2	11	5	0	77
Maldives	53	53	100	91	0	0	2	4	4	0	91												5	60	20	20	0	0	0	0	80
Myanmar	40 241	40 350	100	77	7	6	3	5	2	0	84												8 866	50	20	12	7	7	4	0	70
Nepal	14 028	14 028	100	86	2	5	1	3	3	0	88												2 920	82	1	6	4	3	3	0	84
Sri Lanka	4 431	4 431	100	83	4	5	1	7	0	0	87	11											435	66	5	6	3	17	4	0	71
Thailand	29 081	28 856	99	71	6	8	2	6	3	4	77												2 191	53	9	13	6	7	5	7	62
Timor-Leste	907	908	100	69	10	5	0	12	3	0	79												44	73	7	5	0	16	0	0	80
SEAR	**938 572**	**937 764**	**100**	**84**	**4**	**4**	**2**	**5**	**1**	**0**	**87**	**65**	**0**	**0**									**290 910**	**47**	**25**	**7**	**4**	**14**	**2**	**0**	**72**

Not eval. indicates not evaluated (percentage of registered cases for which outcomes were not recorded); success, sum of cured and completed; cases regist'd, the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2006 is used as the denominator for calculating treatment outcomes unless it is less than the sum of outcomes, in which case the sum of outcomes is used. If the number of cases registered is not reported, then the number of cases notified in 2006 is used, or the sum of outcomes if the latter is greater. Data can be downloaded from www.who.int/tb

Table A3.9 **DOTS re-treatment outcomes, South-East Asia, 2006 cohort**

	Relapse, DOTS									After failure, DOTS									After default, DOTS								
		% of cohort									% of cohort									% of cohort							
	Number regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	% Success	Number regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	% Success	Number regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	% Success
Bangladesh	4 211	70	7	5	2	4	4	8	77																		
Bhutan	42	74	14	2	5	0		5	88	6	17	0	0	33	0		50	17	13	46	15	0	0	0		38	62
DPR Korea	1 501	71	5	4	13	4	3	0	76	2 210	65	9	5	12	5	5	0	73	1 186	66	8	4	13	5	4	0	74
India	89 808	67	6	7	5	14	1	0	73	19 444	50	8	9	14	18	1	0	58	76 519	58	8	8	4	19	2	0	66
Indonesia	4 227	61	16	5	2	11	5	0	77																		
Maldives	4	75	0	25	0	0	0	0	75	0									0								
Myanmar	4 909	62	12	11	6	6	3	0	74	675	52	8	10	16	9	5	0	60	888	50	18	11	5	11	4	0	68
Nepal	2 383	85	1	5	3	3	3	0	86	285	70	1	7	14	4	4	0	71	252	70	2	10	2	11	5	0	73
Sri Lanka	227	75	4	7	2	8	4	0	79	72	74	3	3	6	15	0	0	76	136	46	8	6	2	33	5	0	54
Thailand	1 575	55	10	14	4	7	4	6	65	616	49	5	11	10	9	6	10	53									
Timor-Leste																											
SEAR	**108 887**	**67**	**7**	**7**	**5**	**12**	**2**	**0**	**74**	**23 308**	**52**	**8**	**8**	**14**	**16**	**2**	**0**	**60**	**78 994**	**58**	**8**	**8**	**4**	**19**	**2**	**0**	**66**

Not eval. indicates not evaluated (percentage of registered cases for which outcomes were not recorded); success, sum of cured and completed; cases regist'd, the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2006 is used as the denominator for calculating treatment outcomes unless it is less than the sum of outcomes, in which case the sum of outcomes is used. If the number of cases registered is not reported, then the number of cases notified in 2006 is used, or the sum of outcomes if the latter is greater. Data can be downloaded from www.who.int/tb

Table A3.10 **DOTS treatment success and case detection rates, South-East Asia, 1994–2007**

	DOTS new smear-positive treatment success (%)													DOTS new smear-positive case detection rate (%)												
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2005	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Bangladesh	73	71	72	78	80	81	83	84	84	85	90	91	92	6	14	18	23	23	24	26	30	35	40	54	65	66
Bhutan	71	97	96	85	90	85	90	93	86	90	83	91	89	38	33	31	30	36	41	43	44	45	45	40	42	45
DPR Korea					91	94	91	91	88	88	89	89	86					1	13	27	40	45	51	49	50	64
India	83	79	79	82	84	82	84	85	87	86	86	86	86	0	1	1	2	7	12	23	30	44	56	60	64	68
Indonesia	94	91	81	54	58	50	87	86	86	87	90	91	91	1	4	7	12	19	20	21	30	37	53	66	73	68
Maldives	95	97	93	94	94	94	97	97	95	91	95	86	91	107	103	96	93	97	75	71	75	89	90	94	79	92
Myanmar		66	79	82	82	81	82	81	81	81	84	84	84		27	27	30	34	50	60	69	78	88	102	111	116
Nepal			85	87	89	87	86	88	86	87	87	88	88		5	11	16	45	57	58	61	66	67	67	64	66
Sri Lanka	77	79	80	76	76	84	77	80	81	81	85	86	87	62	60	70	75	77	67	72	71	71	76	93	85	85
Thailand			78	62	68	77	69	75	74	73	74	75	77		0	5	22	41	48	76	68	74	74	77	74	72
Timor-Leste								73	81	81	80	82	79								84	74	69	67	56	61
SEAR	**80**	**74**	**77**	**72**	**72**	**73**	**83**	**84**	**85**	**85**	**87**	**87**	**87**	**1**	**4**	**5**	**8**	**14**	**18**	**26**	**33**	**44**	**55**	**62**	**67**	**69**

Treatment success, sum of cured and completed; DOTS new smear-positive case detection rate, notified new smear-positive cases divided by estimated incident cases. Figures for all years are updated as new information becomes available and/or techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.11 **New smear-positive case notification by age and sex, DOTS and non-DOTS, South-East Asia, 2007**

	Male							Female							All							Male/female
	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+	ratio
Bangladesh	523	10 210	12 442	13 003	13 307	10 653	9 830	829	8 562	8 164	6 678	5 220	3 057	1 818	1 352	18 772	20 606	19 681	18 527	13 710	11 648	2.0
Bhutan	2	60	44	29	26	17	13	3	59	28	21	10	10	6	5	119	72	50	36	27	19	1.4
DPR Korea	353	1 947	2 748	3 717	2 831	2 093	674	406	1 233	1 682	2 672	1 723	1 056	440	759	3 180	4 430	6 389	4 554	3 149	1 114	1.6
India	4 305	73 947	83 850	88 045	76 408	53 414	31 922	7 575	50 289	49 519	32 407	20 316	13 195	7 395	11 880	124 236	133 369	120 452	96 724	66 609	39 317	2.3
Indonesia	849	14 835	21 297	18 606	18 283	14 176	6 762	920	13 371	16 055	13 211	11 391	7 965	2 896	1 769	28 206	37 352	31 817	29 674	22 141	9 658	1.4
Maldives	0	14	4	6	5	6	5	1	5	2	5	5	0	1	1	19	6	11	10	6	6	2.1
Myanmar	127	3 591	6 569	6 826	5 507	3 152	2 155	159	2 719	3 500	2 998	2 486	1 601	1 198	286	6 310	10 069	9 824	7 993	4 753	3 353	1.9
Nepal	150	2 025	1 591	1 636	1 720	1 715	919	175	1 149	1 027	793	619	578	258	325	3 174	2 618	2 429	2 339	2 293	1 177	2.1
Sri Lanka	10	288	477	664	802	649	412	16	279	228	183	182	176	111	26	567	705	847	984	825	523	2.8
Thailand	48	1 261	3 398	4 487	4 168	3 122	3 748	50	885	1 481	1 418	1 302	1 281	1 938	98	2 146	4 879	5 905	5 470	4 403	5 686	2.4
Timor-Leste	4	128	129	89	77	69	65	10	120	98	89	76	36	31	14	248	227	178	153	105	96	1.2
SEAR	**6 371**	**108 306**	**132 549**	**137 108**	**123 134**	**89 066**	**56 505**	**10 144**	**78 671**	**81 784**	**60 475**	**43 330**	**28 955**	**16 092**	**16 515**	**186 977**	**214 333**	**197 583**	**166 464**	**118 021**	**72 597**	**2.0**

For some countries, breakdown of notified cases by age and sex is missing, or is provided for a subset of cases. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.12 **New smear-positive case notification rates by age and sex, DOTS and non-DOTS, South-East Asia, 2007**

	Male							Female							All						
	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+
Bangladesh	2	62	96	129	189	264	352	3	55	67	70	80	76	59	2	58	82	101	136	170	199
Bhutan	2	75	69	71	91	95	82	3	82	57	63	41	65	38	2	78	64	67	68	81	60
DPR Korea	13	100	159	178	209	204	86	15	66	101	132	128	96	32	14	83	130	156	169	148	52
India	2	63	87	118	133	154	113	4	47	56	47	38	39	23	3	55	72	84	87	97	66
Indonesia	3	69	106	112	152	205	114	3	63	80	80	96	105	39	3	66	93	96	124	153	72
Maldives	0	37	15	34	42	94	81	2	14	8	31	43	0	18	1	25	12	33	42	47	51
Myanmar	2	76	152	199	219	224	175	3	59	81	84	92	103	79	2	67	116	140	153	160	122
Nepal	3	69	77	117	172	272	204	3	41	49	49	54	77	43	3	55	63	81	109	167	111
Sri Lanka	0	16	35	49	63	76	70	1	16	15	13	14	19	16	1	16	25	30	38	46	40
Thailand	1	25	69	94	94	113	170	1	18	29	26	27	43	65	1	22	49	58	59	77	109
Timor-Leste	2	109	171	172	195	306	418	4	108	141	162	192	145	188	3	108	156	167	194	222	300
SEAR	**2**	**63**	**92**	**120**	**141**	**170**	**133**	**4**	**49**	**60**	**55**	**52**	**55**	**33**	**3**	**56**	**77**	**88**	**98**	**112**	**79**

Rates are per 100 000 population of each age/sex group. Rates are calculated excluding those countries for which breakdown of notified cases or population by age and sex is missing. Data can be downloaded from www.who.int/tb

Table A3.13 **TB case notifications, South-East Asia, 1980–2007**

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Bangladesh	39 774	42 644	49 870	52 961	45 679	41 802	45 599	45 355	44 280	45 191	48 673	56 052	31 400	54 001	48 276	56 437	63 471	63 420	72 256	79 339	75 557	76 302	81 963	88 156	98 336	123 118	145 186	147 342
Bhutan	1 539	2 657	720	1 017	904	1 073	1 582	608	1 126	1 525	1 154	996	140	108	1 159	1 299	1 271	1 211	1 292	1 174	1 140	1 037	1 089	1 026	988	1 007	917	999
DPR Korea									0									11 050	1 152	12 287	34 131	29 284	40 159	41 810	44 602	42 722	44 558	58 802
India	705 600	769 540	923 095	1 075 098	1 109 310	1 168 804	1 279 536	1 403 122	1 457 288	1 510 500	1 519 182	1 555 353	1 121 120	1 081 279	1 114 374	1 218 183	1 290 343	1 132 859	1 102 002	1 218 743	1 115 718	1 085 075	1 060 951	1 073 282	1 136 182	1 156 248	1 228 827	1 295 943
Indonesia	25 235	32 461	33 000	31 809	32 432	17 681	16 750		97 505	105 516	74 470	60 808	98 458	62 966	49 647	35 529	24 647	22 184	40 497	69 064	84 591	92 792	155 188	174 174	210 229	254 601	277 589	275 193
Maldives	73	112	111	143	123	91	111	115	85	203	152	123	92	175	249	231	212	173	176	153	132	139	125	137	119	122	99	127
Myanmar	12 744	12 461	12 069	11 012	11 045	10 506	10 840	11 986	9 348	10 940	12 416	14 905	17 000	19 009	15 583	18 229	22 201	17 122	14 756	19 626	30 840	42 838	57 012	75 744	96 662	107 009	122 472	129 081
Nepal	1 020	337	1 459	700	190	52	252	1 012	1 603	11 003	10 142	8 983		13 161	15 572	19 804	22 970	24 158	24 135	27 356	29 519	29 519	30 359	30 925	31 979	33 448	32 670	32 940
Sri Lanka	6 212	6 288	7 334	6 666	6 376	5 889	6 596	6 411	6 092	6 429	6 666	6 174	6 802	6 809	6 132	5 956	5 366	6 542	6 925	7 157	8 413	7 499	8 939	8 998	8 562	9 249	8 510	8 718
Thailand	45 704	49 452	48 553	65 413	69 240	77 611	52 152	51 835	50 021	44 553	46 510	43 858	47 697	49 668	47 767	45 428	39 871	30 262	15 850	29 413	34 187	49 656	49 581	54 504	55 306	57 895	56 230	54 793
Timor-Leste	0																						2 760	2 760	3 716	3 767	3 586	3 255
SEAR	**837 901**	**915 952**	**1 076 211**	**1 244 819**	**1 275 299**	**1 323 509**	**1 413 418**	**1 520 444**	**1 667 348**	**1 735 860**	**1 719 365**	**1 747 252**	**1 322 709**	**1 287 176**	**1 298 759**	**1 401 096**	**1 470 352**	**1 308 981**	**1 279 041**	**1 464 312**	**1 414 228**	**1 414 141**	**1 488 126**	**1 551 516**	**1 686 681**	**1 789 186**	**1 920 644**	**2 007 193**
Number reporting	10	9	9	9	9	9	9	8	10	9	9	9	8	9	9	9	9	10	10	10	10	10	11	11	11	11	11	11
% reporting	91	82	82	82	82	82	82	73	91	82	82	82	73	82	82	82	82	91	91	91	91	91	130	100	100	100	100	100

From 1995 on, number shown is all notified new and relapse cases (DOTS and non-DOTS). Figures for all years are updated as new information becomes available, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.14 **TB case notification rates, South-East Asia, 1980–2007**

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Bangladesh	45	47	53	55	47	42	44	43	41	41	43	48	27	45	39	45	49	48	54	58	54	54	57	60	65	80	93	93
Bhutan	364	612	162	223	193	223	319	118	212	281	211	183	26	21	226	256	250	234	244	216	204	181	184	169	159	158	141	152
DPR Korea																		50	5	54	149	127	173	179	190	181	188	247
India	102	109	128	146	147	152	162	174	177	179	177	177	125	118	119	128	133	114	109	119	107	102	98	98	102	102	107	111
Indonesia	17	21	21	20	20	11	10		55	59	41	33	52	33	26	18	12	11	20	33	40	43	71	79	94	113	121	119
Maldives	46	69	66	83	69	50	59	59	42	97	70	55	40	74	103	93	84	67	67	57	48	50	44	48	41	41	33	42
Myanmar	38	37	35	31	31	29	29	31	24	28	31	37	41	45	37	42	51	39	33	43	67	92	122	161	203	223	253	265
Nepal	7	2	9	4	1	0	1	6	9	59	53	46		64	74	91	103	106	103	115	121	118	119	119	120	123	118	117
Sri Lanka	42	41	48	43	40	37	41	39	37	38	39	36	39	38	34	33	29	36	37	38	45	40	47	47	45	48	44	45
Thailand	98	104	100	133	138	153	101	99	94	83	86	80	86	88	84	79	69	51	27	49	56	81	80	88	88	92	89	86
Timor-Leste																							308	289	367	353	322	282
SEAR	**79**	**85**	**97**	**110**	**110**	**112**	**117**	**124**	**133**	**135**	**131**	**131**	**97**	**93**	**92**	**97**	**100**	**88**	**84**	**95**	**90**	**89**	**92**	**94**	**101**	**105**	**112**	**115**

Rates are per 100 000 population. From 1995 on, number shown is notification rate of new and relapse cases. Figures for all years are updated as new information becomes available and/or techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.15 **New smear-positive cases notified, South-East Asia, 1990–2007**

	Number of cases																		Rate (per 100 000 population)																	
	1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Bangladesh				18 993	1 710	20 524	29 674	33 117	37 737	37 821	38 484	40 777	46 811	53 618	62 694	84 848	101 967	104 296				16	1	16	23	25	28	28	28	29	32	36	42	55	65	66
Bhutan					352	367	308	284	270	315	347	359	364	360	356	308	312	328					69	72	61	55	51	58	62	63	62	59	57	48	48	50
DPR Korea								3 980	403	5 073	16 440	14 429	18 576	17 392	18 479	17 796	18 435	23 575								18	2	22	72	62	80	74	79	75	78	99
India				225 256	226 543	264 515	290 953	274 877	278 275	345 150	349 374	384 827	395 833	433 564	489 195	508 890	553 851	592 587				25	24	28	30	28	28	34	33	36	37	39	44	45	48	51
Indonesia				62 966	49 647	31 768	11 790	19 492	32 280	49 172	52 338	53 965	76 230	92 566	128 981	158 640	175 320	160 617				33	26	16	6	10	16	24	25	25	35	42	58	70	77	69
Maldives				126	125	114	106	95	88	88	65	59	60	68	66	66	53	59				53	52	46	42	37	33	33	24	21	21	24	23	22	18	19
Myanmar					946	8 681	9 716	9 695	10 089	11 458	17 254	21 161	24 162	27 448	31 408	36 541	40 241	42 588					2	20	22	22	22	25	38	46	52	58	66	76	83	87
Nepal				6 679	10 442	8 591	10 365	11 323	11 306	13 410	13 683	13 683	13 714	14 348	14 614	14 617	14 028	14 355				32	49	40	47	50	48	56	56	55	54	55	55	54	51	51
Sri Lanka	2 769	3 023	3 218	3 335	3 405	3 049	2 958	3 506	3 761	3 911	4 314	4 316	4 297	4 321	4 302	4 868	4 442	4 528	16	17	18	19	19	17	16	19	20	21	23	23	23	23	23	25	23	23
Thailand					20 260	20 273	16 997	13 214	7 962	14 934	17 754	28 363	25 593	28 459	28 421	29 762	29 081	28 487					36	35	29	22	13	25	29	46	41	46	45	47	46	45
Timor-Leste													1 090	1 027	1 014	1 035	907	1 021													122	108	100	97	81	88
SEAR	**2 769**	**3 023**	**3 218**	**317 355**	**313 430**	**357 882**	**372 867**	**369 583**	**382 171**	**481 332**	**510 053**	**561 939**	**606 730**	**673 171**	**779 530**	**857 371**	**938 637**	**972 441**	**< 1**	**< 1**	**< 1**	**23**	**22**	**25**	**25**	**25**	**25**	**31**	**32**	**35**	**37**	**41**	**47**	**51**	**55**	**56**

Rates are per 100 000 population. Figures for all years are updated as new information becomes available and/or techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.16 **NTP budgets, available funding, cost of utilization of general health-care services and total TB control costs (US$ millions), South-East Asia, 2009**

		Available funding							
	NTP budget	Government (excluding loans)	Loans	Grants (excluding Global Fund)	Global Fund	Funding gap	Cost of utilization of general health-care services	Total TB control costs	Completeness of budget data
Bangladesh	15	4.9	1.1	0	9.2	3.1	5.8	21	C
Bhutan	1.9	1.4	0	0	0.5	0	< 0.01	2.0	C
DPR Korea	16	2.9	0	0	0	13	1.7	18	C
India	100	9.2	37	9.8	14	30	38	138	C
Indonesia	80	34	0	13	17	16	4.8	85	C
Maldives	0.2	0.2	0	0.03	0	0	0.1	0.3	C
Myanmar	11	1.2	0	5.3	0	4.3	1.9	13	C
Nepal	4.8	0.6	0	0.2	3.8	0.2	1.8	6.7	C
Sri Lanka	8.3	5.4	0	0	2.4	0.5	3.8	12	C
Thailand	50	46	0	0	0.8	3.2	1.0	51	C
Timor-Leste	1.8	0.3	0	0	1.6	0.01		1.8	P
SEAR	**289**	**107**	**38**	**29**	**49**	**70**	**59**	**348**	**91%**

N indicates data not available or not applicable; P indicates partial financial data; C indicates complete data and therefore included in analysis presented in chapter 3. Completeness of budget data in total row indicates percentage of countries providing complete financial data. Data can be downloaded from www.who.int/tb

Notes

Bangladesh

TABLE A3.5: the population estimate used by the NTP (142 million) is lower than that of the United Nations Population Division (159 million). Using the smaller population estimate gives a notification rate of new smear-positive cases of 74 per 100 000 population, and a smear-positive case detection rate of 73%.

India

TABLE A3.5: the population estimate used by the NTP (1131 million) is lower than that of the United Nations Population Division (1169 million). Using the smaller population estimate gives a notification rate of new smear-positive cases of 52 per 100 000 population, and a smear-positive case detection rate of 70%.

ANNEX 1 (COUNTRY PROFILE): low treatment success rates in 2000–2002 are because a large number of non-DOTS cases were not evaluated.

Myanmar

ANNEX 1 (COUNTRY PROFILE); TABLE A3.10: treatment outcomes of the 2005 cohort of new smear-positive cases published in the 2008 report did not include HIV-positive patients; in this report these patients are now included.

WESTERN PACIFIC

Western Pacific

NTP MANAGER (OR EQUIVALENT) AND/OR PERSON(S) RESPONSIBLE FOR COMPLETING DATA COLLECTION FORM	
American Samoa	Faafetai Teo-Yandall
Australia	Yasmine Gray; Kate Robinson
Brunei Darussalam	Hjh Kalsom Binti Abdul Latif; B. Badesab
Cambodia	Mao Tan Eang; Tieng Sivanna
China	Wang Lixia; Cheng Shiming
China, Hong Kong SAR	Cheuk-ming Tam
China, Macao SAR	Chou Kuok Hei
Cook Islands	
Fiji	Joe Koroivueta
French Polynesia	Henri-Pierre Mallet; Jean-Paul Pescheux
Guam	Cecilia Teresa T. Arciaga
Japan	Tamami Umeda; Seiya Kato
Kiribati	Bereka Reiher; Katua Tianuare
Lao PDR	Phannasinh Sylavanh; Phonenaly Chittamany
Malaysia	Hasan bin Abdul Rahman; Mohamed Paid bin Yusof
Marshall Islands	Kenner Briand; Risa J. Bukbuk
Micronesia	Mayleen Jack Ekiek
Mongolia	Khandaasuren Dovdon; Nasanjargal Purev
Nauru	Isabella Amwano
New Caledonia	Bernard Rouchon; Oksana Segur
New Zealand	Alison Roberts; Ingrid Hamilton
Niue	Marina Pulu; Minemaligi Pulu
Northern Mariana Islands	Richard Brostrom; Marites Fabul
Palau	Henrietta Merei
Papua New Guinea	Paul K. Aia; Andrew Kamarepa
Philippines	Rosalind Vianzon; Anna Marie Celina Garfin; Arlene Rivera
Rep. of Korea	Hee Byoung Yoo; En Hi Cho
Samoa	
Singapore	Wang Yee Tang; Khin Mar Kyi Win
Solomon Islands	Noel Itogo
Tokelau	Tekie Iosefa
Tonga	Saia Penitani
Tuvalu	Nese Ituaso Conway
Vanuatu	Markleen Tagaro
Viet Nam	Dinh Ngoc Sy
Wallis & Futuna	Laurent Morisse

This list shows the people named on the data collection form sent to WHO in 2008, not necessarily the current NTP manager. It is intended as an acknowledgement rather than a directory.

Table A3.1 **Methods and assumptions for estimation of TB incidence, prevalence and mortality, Western Pacific**

	Reference year	Incidence est. based on	Trend	Source of estimates			Cfr ss+ HIV-		Duration ss+HIV-		Duration ss-HIV-	
				TB/HIV	MDR (new)	MDR (re-treat)	DOTS	non-DOTS	DOTS	non-DOTS	DOTS	non-DOTS
American Samoa	2005	Notif.	Constant CDR	–	Model	Model	0.1	0.2	1	2	1	2
Australia	2002	Notif.	Country notifs, moving ave.	Indirect	–	–	0.12	0.12	1	1	1	1
Brunei Darussalam	1998	Prev.	Constant CDR	Indirect	Model	Model	0.1	0.2	1	1.5	1	1.5
Cambodia	2002	Prev.	Group, exp.	Survey	DRS	DRS	0.1	0.2	0.945	1.2	1	1.95
China	2003	ARI/Prev.	ARI	Indirect	DRS	DRS	0.1	0.2	2	3.18	2	3.18
China, Hong Kong SAR	1997	Notif.	Country notifs, moving ave.	Survey	DRS	DRS	0.1	0.1	1	1	1	1
China, Macao SAR	2000	Comparison	Country notifs, moving ave.	Routine	DRS	DRS	0.1	0.2	1	1.5	1	1.5
Cook Islands	2005	Notif.	Constant CDR	–	Model	Model	0.1	0.2	1	2	1	2
Fiji	2005	Notif.	Country notifs, exp.	Indirect	–	–	0.1	0.2	1	2	1	2
French Polynesia	2005	Notif.	Constant CDR	–	Model	Model	0.1	0.2	1	2	1	2
Guam	2005	Notif.	Constant CDR	Survey	–	–	0.1	0.2	1	2	1	2
Japan	1999	Notif.	Country notifs, moving ave.	Routine	DRS	DRS	0.15	0.15	1.3	1.3	1.3	1.3
Kiribati	2005	Notif.	Group, exp.	–	Model	Model	0.1	0.2	1	2	1	2
Lao PDR	1997	ARI	Group, exp.	Indirect	Model	Model	0.1	0.2	1.5	2.5	1.5	2.5
Malaysia	1997	Notif.	Country notifs, exp.	Routine	DRS	DRS	0.1	0.2	1	1.5	1	1.5
Marshall Islands	2005	Notif.	Group, exp.	Routine	Model	Model	0.1	0.2	1	2	1	2
Micronesia	2005	Notif.	Country notifs, exp.	–	Model	Model	0.1	0.2	1	2	1	2
Mongolia	1997	Prev.	Not estimated	Sentinel	DRS	Model	0.1	0.2	1	2.5	1	2.5
Nauru	2005	Notif.	Constant CDR	–	Model	Model	0.1	0.2	1	2	1	2
New Caledonia	2005	Notif.	Constant CDR	–	–	–	0.1	0.2	1	2	1	2
New Zealand	1999	Notif.	Country notifs, moving ave.	Indirect	DRS	DRS	0.12	0.12	1	1	1	1
Niue	2005	Notif.	Constant CDR	–	Model	Model	0.1	0.2	1	2	1	2
Northern Mariana Islands	2005	Notif.	Constant CDR	Routine	–	–	0.1	0.2	1	2	1	2
Palau	2000	Notif.	Constant CDR	–	Model	Model	0.1	0.2	1	2	1	2
Papua New Guinea	1997	Prev.	Not estimated	Indirect	Model	Model	0.1	0.3	2	2	2	2
Philippines	2007	Prev.	Prevalence	Indirect	DRS	DRS	0.1	0.3	1.5	2	1.5	2
Rep. of Korea	1997	Prev.	Country notifs, moving ave.	Indirect	DRS	DRS	0.12	0.12	1	1.5	1	1.5
Samoa	2005	Notif.	Country notifs, exp.	–	Model	Model	0.1	0.2	1	2	1	2
Singapore	1997	Notif.	Country notifs, moving ave.	Indirect	DRS	DRS	0.12	0.12	1	1	1	1
Solomon Islands	2005	Notif.	Country notifs, exp.	–	–	–	0.1	0.2	1	2	1	2
Tokelau	2005	Notif.	Constant CDR	–	Model	Model	0.1	0.2	1	2	1	2
Tonga	2005	Notif.	Group, exp.	Routine	Model	Model	0.1	0.2	1	2	1	2
Tuvalu	2005	Notif.	Country notifs, exp.	–	Model	Model	0.1	0.2	1	2	1	2
Vanuatu	2005	Notif.	Country notifs, exp.	–	Model	Model	0.1	0.2	1	2	1	2
Viet Nam	1997	ARI	Group, exp.	Indirect	DRS	DRS	0.1	0.2	1	2	1	2
Wallis & Futuna	2005	Notif.	Constant CDR	–	Model	Model	0.1	0.2	1	2	1	2

– indicates no estimate; ARI, annual risk of infection; ave, average; C-ReC., capture re-capture; CDR, case detection rate; DRS, drug resistance survey; exp., exponential; HIV+, HIV-positive; HIV-, HIV-negative; Mort., mortality (vital registration); Notif(s)., notification(s); Prev., disease prevalence survey; ss+, sputum smear-positive; ss-, sputum smear-negative. See Annex 2 (methods) for details. Data can be downloaded from www.who.int/tb

Table A3.2 **Estimated burden of TB, Western Pacific, 1990 and 2007**

	Incidence, 1990				Prevalence, 1990		TB mortality, 1990		Incidence, 2007								Prevalence, 2007				TB mortality, 2007				HIV prevalence	MDR, 2007			
	All forms*		Smear-positive*		All forms*		All forms*		All forms*		All forms HIV+		Smear-positive*		Smear-positive HIV+		All forms*		All forms HIV+		All forms*		All forms HIV+		in incident TB	Percentage of		Number among	
	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	cases, 2007 (%)	new	re-treat	all cases	smear-positive
American Samoa	10	21	5	10	20	42	2	5	3	5	–	–	< 1	< 1	–	–	3	5	–	–	< 1	< 1	–	–	–	–	–	–	–
Australia	1 120	7	503	3	1 139	7	112	< 1	1 295	6	41	< 1	579	3	14	< 1	1 303	6	20	< 1	129	< 1	4	< 1	3.2	–	–	38	–
Brunei Darussalam	148	58	67	26	234	91	27	10	230	59	< 1	< 1	151	39	< 1	< 1	252	65	< 1	< 1	27	7	< 1	< 1	< 0.05	2.0	20	7	5
Cambodia	56 742	585	25 258	260	90 001	928	11 567	119	71 504	495	5 560	38	31 621	219	1 946	13	95 974	664	2 780	19	12 925	89	1 843	13	7.8	< 0.05	3.1	94	94
China	1 338 563	116	602 242	52	3 758 426	327	285 172	25	1 305 770	98	24 705	2	585 126	44	8 647	< 1	2 582 469	194	12 353	< 1	200 614	15	6 774	< 1	1.9	5.0	26	112 348	76 154
China, Hong Kong SAR	5 355	94	2 410	42	5 475	96	461	8	4 461	62	–	–	2 007	28	–	–	4 561	63	–	–	384	5	–	–	–	0.9	8.0	82	61
China, Macao SAR	258	69	116	31	258	69	19	5	301	63	–	–	135	28	–	–	301	63	–	–	22	5	–	–	–	2.3	16	12	8
Cook Islands	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	2	15	–	–	< 1	7	–	–	4	31	–	–	< 1	4	–	–	–	–	–	–	–
Fiji	366	51	165	23	495	68	65	9	174	21	4	< 1	78	9	1	< 1	255	30	2	< 1	29	4	1	< 1	2.0	–	–	< 1	–
French Polynesia	66	34	30	15	131	67	14	7	71	27	–	–	21	8	–	–	83	32	–	–	8	3	–	–	–	2.1	20	2	< 1
Guam	69	51	31	23	137	103	14	11	59	34	–	–	6	3	–	–	63	36	–	–	4	2	–	–	–	–	–	< 1	–
Japan	58 085	47	26 128	21	76 340	62	7 033	6	26 994	21	126	< 1	12 135	9	44	< 1	35 767	28	63	< 1	3 331	3	14	< 1	0.5	0.7	10	389	285
Kiribati	369	513	166	231	737	1 026	83	116	347	365	–	–	156	164	–	–	402	423	–	–	46	49	–	–	–	3.1	20	13	8
Lao PDR	7 278	179	3 275	80	17 449	428	1 538	38	8 851	151	295	5	3 954	67	103	2	16 906	289	147	3	1 410	24	99	2	3.3	3.5	20	386	217
Malaysia	21 435	118	9 635	53	28 851	159	3 890	21	27 439	103	4 433	17	11 904	45	1 552	6	32 251	121	2 217	8	4 830	18	1 296	5	16	0.1	< 0.05	27	12
Marshall Islands	143	302	64	136	286	605	32	68	128	215	–	–	57	97	–	–	166	281	–	–	19	32	–	–	–	2.8	20	6	4
Micronesia	182	188	82	85	254	263	32	33	108	97	–	–	49	44	–	–	111	100	–	–	10	9	–	–	–	3.0	21	6	4
Mongolia	4 552	205	2 049	92	10 580	477	1 069	48	5 400	205	8	< 1	2 429	92	3	< 1	6 142	234	4	< 1	762	29	1	< 1	0.1	1.0	26	198	169
Nauru	8	85	4	38	16	170	2	19	3	33	–	–	3	33	–	–	3	33	–	–	< 1	3	–	–	–	–	–	–	–
New Caledonia	159	93	72	42	191	112	18	10	52	22	–	–	13	6	–	–	60	25	–	–	4	2	–	–	–	–	–	< 1	–
New Zealand	346	10	155	5	351	10	35	1	299	7	4	< 1	134	3	1	< 1	303	7	2	< 1	30	< 1	< 1	< 1	1.2	0.4	< 0.05	1	< 1
Niue	1	59	< 1	26	3	118	< 1	13	< 1	< 1	–	–	< 1	< 1	–	–	< 1	< 1	–	–	< 1	< 1	–	–	–	–	–	–	–
Northern Mariana Islands	31	71	14	32	62	142	6	13	49	58	–	–	16	19	–	–	60	72	–	–	6	7	–	–	–	–	–	< 1	–
Palau	10	64	4	29	14	96	2	12	12	60	–	–	6	27	–	–	14	71	–	–	2	8	–	–	–	2.2	20	< 1	< 1
Papua New Guinea	10 307	250	4 636	112	20 579	498	2 816	68	15 796	250	2 930	46	6 815	108	1 026	16	27 197	430	1 465	23	3 817	60	1 049	17	19	3.5	20	864	553
Philippines	240 889	393	108 400	177	489 394	799	53 419	87	255 084	290	874	< 1	114 701	130	306	< 1	440 035	500	437	< 1	36 305	41	271	< 1	0.3	4.0	21	12 125	6 451
Rep. of Korea	70 946	165	31 926	74	95 626	223	8 024	19	43 222	90	413	< 1	19 409	40	144	< 1	60 969	126	206	< 1	4 887	10	45	< 1	1.0	2.7	14	2 337	1 696
Samoa	51	32	23	14	58	36	8	5	35	19	–	–	16	8	–	–	47	25	–	–	5	3	–	–	–	2.9	20	1	< 1
Singapore	1 493	50	672	22	1 560	52	169	6	1 176	27	40	< 1	525	12	14	< 1	1 190	27	20	< 1	122	3	4	< 1	3.4	0.2	1.0	4	3
Solomon Islands	980	312	441	141	1 960	625	221	70	634	128	–	–	285	58	–	–	891	180	–	–	105	21	–	–	–	–	–	–	–
Tokelau	1	69	< 1	31	2	139	< 1	33	< 1	< 1	–	–	< 1	< 1	–	–	< 1	< 1	–	–	< 1	< 1	–	–	–	–	–	–	–
Tonga	32	34	14	15	43	45	6	6	24	24	–	–	11	11	–	–	29	28	–	–	2	2	–	–	–	2.7	20	< 1	< 1
Tuvalu	28	296	13	133	56	593	6	62	18	166	–	–	8	75	–	–	21	203	–	–	2	17	–	–	–	–	–	–	–
Vanuatu	207	139	93	62	415	278	47	31	174	77	–	–	78	35	–	–	231	102	–	–	27	12	–	–	–	–	–	–	–
Viet Nam	133 898	202	60 245	91	241 512	365	21 727	33	149 588	171	12 052	14	66 109	76	4 218	5	192 092	220	6 026	7	20 678	24	3 101	4	8.1	2.7	19	6 468	4 199
Wallis & Futuna	9	63	4	28	17	126	2	15	2	15	–	–	1	7	–	–	4	25	–	–	< 1	3	–	–	–	–	–	–	–
WPR	**1 954 134**	**129**	**878 939**	**58**	**4 842 675**	**320**	**397 633**	**26**	**1 919 306**	**108**	**51 483**	**3**	**858 539**	**48**	**18 019**	**1**	**3 500 160**	**197**	**25 741**	**1**	**290 546**	**16**	**14 503**	**< 1**	**2.7**	**4.3**	**24**	**135 411**	**89 926**

– Indicates no estimate.
* Incidence, prevalence and mortality estimates include patients with HIV. Estimates labelled "HIV+" are estimates of HIV+ TB cases in all people. Estimates for all years are re-calculated as new information becomes available and techniques are refined, so they may differ from those published previously. See Explanatory notes for further details.
Data can be downloaded from www.who.int/tb

Table A3.3 **Estimated incidence of TB (all forms) in all people, Western Pacific, 1990–2007**

	Number of cases																	
	1 990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
American Samoa	10	3	1	4	4	6	0	7	3	4	3	3	2	3	6	7	4	3
Australia	1 120	1 142	1 133	1 174	1 197	1 243	1 277	1 211	1 196	1 156	1 188	1 165	1 129	1 159	1 172	1 252	1 274	1 295
Brunei Darussalam	148	153	157	162	166	170	175	179	184	302	341	240	256	229	196	181	224	230
Cambodia	56 742	58 170	59 596	60 984	62 286	63 473	64 536	65 485	66 329	67 087	67 773	68 391	68 946	69 458	69 956	70 460	70 976	71 504
China	1 338 563	1 341 945	1 343 909	1 344 766	1 344 997	1 344 933	1 344 658	1 344 043	1 342 951	1 341 180	1 338 609	1 335 229	1 331 154	1 326 540	1 321 589	1 316 456	1 311 184	1 305 770
China, Hong Kong SAR	5 355	5 308	5 316	5 331	5 245	5 233	5 436	5 837	5 600	5 310	5 056	5 244	5 220	4 915	4 745	4 640	4 552	4 461
China, Macao SAR	258	264	248	251	280	358	421	439	409	374	374	355	334	292	282	283	292	301
Cook Islands	0	1	7	6	4	2	1	2	0	3	1	2	1	0	1	1	1	2
Fiji	366	350	336	323	311	299	286	274	262	251	240	229	219	209	199	190	182	174
French Polynesia	66	54	92	87	99	116	96	101	117	103	69	69	71	56	67	70	77	71
Guam	69	69	67	78	104	68	67	67	66	66	60	70	57	65	56	70	49	59
Japan	58 085	56 533	55 276	52 967	50 773	48 402	47 566	47 914	47 425	46 380	43 196	40 220	37 326	35 177	33 074	30 708	28 857	26 994
Kiribati	369	368	366	363	361	359	357	356	354	354	353	352	352	351	351	350	348	347
Lao PDR	7 278	7 425	7 571	7 714	7 850	7 976	8 092	8 198	8 294	8 379	8 454	8 518	8 572	8 622	8 671	8 726	8 786	8 851
Malaysia	21 435	21 843	22 239	22 629	23 021	23 422	23 834	24 250	24 662	25 057	25 426	25 765	26 078	26 370	26 649	26 920	27 183	27 439
Marshall Islands	143	144	144	143	141	140	137	135	133	131	129	128	127	127	127	127	127	128
Micronesia	182	179	177	174	171	166	161	155	148	142	137	132	127	123	119	116	112	108
Mongolia	4 552	4 649	4 731	4 800	4 858	4 908	4 950	4 983	5 011	5 040	5 073	5 111	5 155	5 203	5 252	5 301	5 351	5 400
Nauru	8	13	13	13	4	13	13	13	12	2	4	3	6	3	11	12	13	3
New Caledonia	159	156	156	116	108	97	116	98	100	87	104	68	72	42	68	52	53	52
New Zealand	346	351	325	331	356	384	374	364	397	405	410	368	383	381	382	368	334	299
Niue	1	1	1	1	1	1	2	0	0	1	0	0	4	0	0	0	0	0
Northern Mariana Islands	31	47	74	51	51	53	57	103	108	73	83	64	59	50	59	63	57	49
Palau	10	7	4	28	46	21	6	17	10	36	10	10	12	10	6	11	13	12
Papua New Guinea	10 307	10 577	10 854	11 141	11 439	11 748	12 068	12 399	12 738	13 081	13 426	13 773	14 120	14 466	14 808	15 144	15 473	15 796
Philippines	240 889	242 185	243 429	244 606	245 697	246 693	247 584	248 379	249 118	249 848	250 599	251 377	252 160	252 917	253 609	254 203	254 694	255 084
Rep. of Korea	70 946	62 852	56 587	49 299	47 082	44 219	42 424	39 654	36 967	32 769	33 691	34 743	39 234	38 162	39 381	40 867	42 044	43 222
Samoa	51	50	49	48	47	46	45	44	43	42	41	40	40	39	38	37	36	35
Singapore	1 493	1 541	1 614	1 566	1 598	1 632	1 723	1 791	1 752	1 680	1 505	1 419	1 373	1 337	1 290	1 210	1 193	1 176
Solomon Islands	980	956	934	912	890	869	848	828	807	787	767	748	728	709	690	671	652	634
Tokelau	1	1	1	1	0	2	0	1	1	0	0	0	1	0	1	0	0	0
Tonga	32	31	31	31	30	30	29	29	28	28	27	27	26	26	25	25	24	24
Tuvalu	28	27	27	26	25	25	24	23	23	22	21	21	20	20	19	19	18	18
Vanuatu	207	206	205	204	203	201	198	195	192	189	186	184	183	181	180	178	176	174
Viet Nam	133 898	135 536	137 147	138 678	140 063	141 262	142 255	143 066	143 754	144 399	145 058	145 748	146 453	147 156	147 831	148 461	149 044	149 588
Wallis & Futuna	9	24	4	12	12	7	9	16	8	8	8	1	21	17	7	8	7	2
WPR	**1 954 134**	**1 953 163**	**1 952 822**	**1 949 018**	**1 949 523**	**1 948 576**	**1 949 824**	**1 950 655**	**1 949 201**	**1 944 776**	**1 942 425**	**1 939 819**	**1 940 021**	**1 934 413**	**1 930 914**	**1 927 186**	**1 923 413**	**1 919 306**

	Rate (per 100 000 population)																			
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
American Samoa	21	7	2	9	9	11	< 1	12	6	8	6	6	4	5	9	10	7	5
Australia	7	7	7	7	7	7	7	7	6	6	6	6	6	6	6	6	6	6
Brunei Darussalam	58	58	58	58	58	58	58	58	58	93	102	70	73	64	53	48	59	59
Cambodia	585	579	574	568	563	557	552	546	541	536	530	525	520	515	510	505	500	495
China	116	115	114	113	112	111	110	109	108	106	105	104	103	102	101	100	99	98
China, Hong Kong SAR	94	92	90	89	86	84	86	91	86	81	76	78	76	71	68	66	64	62
China, Macao SAR	69	69	63	63	69	87	101	104	95	86	85	79	74	63	60	60	61	63
Cook Islands	< 1	6	37	31	24	12	6	13	< 1	20	7	14	7	< 1	8	8	8	15
Fiji	51	48	46	43	41	39	37	35	33	32	30	28	27	26	24	23	22	21
French Polynesia	34	27	45	42	47	54	43	45	51	45	29	29	29	22	26	27	30	27
Guam	51	50	48	55	73	46	45	45	44	43	39	44	35	40	33	42	29	34
Japan	47	46	44	42	41	39	38	38	37	37	34	32	29	28	26	24	23	21
Kiribati	513	503	493	483	474	464	455	446	437	428	420	412	403	396	388	380	372	365
Lao PDR	179	177	175	173	172	170	168	167	165	163	162	160	159	157	156	154	153	151
Malaysia	118	117	117	116	115	114	113	112	111	110	109	108	108	107	106	105	104	103
Marshall Islands	302	296	291	285	279	274	268	263	258	253	248	243	238	233	229	224	220	215
Micronesia	188	181	174	168	161	155	149	143	138	133	128	123	118	114	109	105	101	97
Mongolia	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205
Nauru	85	143	140	137	45	132	129	127	124	22	44	33	55	33	110	121	132	33
New Caledonia	93	89	87	63	57	50	58	48	48	41	49	31	32	19	29	22	22	22
New Zealand	10	10	9	9	10	10	10	10	10	11	11	9	10	10	9	9	8	7
Niue	59	58	56	55	54	53	101	< 1	< 1	57	< 1	< 1	253	< 1	< 1	< 1	< 1	< 1
Northern Mariana Islands	71	101	150	97	93	92	94	166	167	110	121	90	80	66	75	79	69	58
Palau	64	44	28	172	275	124	32	92	54	188	52	51	62	50	28	55	66	60
Papua New Guinea	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
Philippines	393	386	380	373	366	360	353	347	341	335	329	323	317	312	306	301	295	290
Rep. of Korea	165	145	129	112	106	98	93	87	80	71	72	74	83	80	83	85	87	90
Samoa	32	31	30	29	28	27	26	26	25	24	23	23	22	21	21	20	19	19
Singapore	50	50	51	48	47	47	48	48	46	43	37	35	33	32	30	28	27	27
Solomon Islands	312	296	281	267	253	240	228	216	205	195	185	175	166	158	150	142	135	128
Tokelau	69	70	72	56	< 1	150	< 1	56	56	< 1	< 1	< 1	56	< 1	56	< 1	< 1	< 1
Tonga	34	33	32	32	31	31	30	29	29	28	28	27	27	26	26	25	25	24
Tuvalu	296	287	277	268	259	250	242	234	226	218	211	204	197	191	184	178	172	166
Vanuatu	139	134	130	125	121	117	113	109	105	102	98	95	92	89	86	83	80	77
Viet Nam	202	200	198	196	195	193	191	189	187	185	183	182	180	178	176	175	173	171
Wallis & Futuna	63	176	32	87	86	47	62	107	54	53	52	7	141	111	48	52	46	15
WPR	**129**	**127**	**126**	**124**	**123**	**121**	**120**	**119**	**118**	**116**	**115**	**114**	**113**	**112**	**111**	**110**	**109**	**108**

Estimates for all years are re-calculated as new information becomes available and techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.4 **Estimated incidence, prevalence and mortality rates (per 100 000 population), Western Pacific, 2000–2007**

	Incidence of HIV+ TB cases								Prevalence of TB (all forms)								Mortality (excluding HIV+)								Mortality HIV+							
	2000	2001	2002	2003	2004	2005	2006	2007	2000	2001	2002	2003	2004	2005	2006	2007	2000	2001	2002	2003	2004	2005	2006	2007	2000	2001	2002	2003	2004	2005	2006	2007
American Samoa	–	–	–	–	–	–	–	–	8	6	5	6	9	11	9	5	1	< 1	< 1	< 1	< 1	< 1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Australia	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	6	6	6	6	6	6	6	6	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Brunei Darussalam	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	108	85	78	73	63	55	59	65	9	7	6	7	7	6	5	7	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cambodia	75	71	66	60	54	47	43	38	758	750	728	712	696	676	672	664	83	83	80	78	78	76	77	77	29	27	24	21	19	16	14	13
China	1	1	2	2	2	2	2	2	269	265	259	241	220	206	200	194	19	19	19	18	16	15	15	15	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
China, Hong Kong SAR	–	–	–	–	–	–	–	–	78	79	78	73	69	67	65	63	7	7	7	6	6	6	5	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
China, Macao SAR	–	–	–	–	–	–	–	–	87	82	78	67	61	60	61	63	8	7	7	6	5	4	4	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cook Islands	–	–	–	–	–	–	–	–	12	29	11	< 1	15	9	16	31	< 1	10	2	< 1	5	1	2	4	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Fiji	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	42	35	36	29	33	31	30	30	5	4	4	3	4	4	3	3	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
French Polynesia	–	–	–	–	–	–	–	–	40	42	32	29	28	31	31	32	5	5	3	3	2	3	2	3	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Guam	–	–	–	–	–	–	–	–	44	45	44	47	41	42	39	36	4	5	6	5	5	3	5	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Japan	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	45	41	39	36	34	32	30	28	4	4	4	3	3	3	3	3	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Kiribati	–	–	–	–	–	–	–	–	546	607	587	477	439	419	405	423	62	71	68	55	45	49	46	49	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lao PDR	< 1	1	2	2	3	3	4	5	344	337	330	324	313	298	291	289	27	27	26	26	25	23	23	22	< 1	< 1	< 1	< 1	< 1	1	1	2
Malaysia	10	11	13	14	15	15	16	17	135	133	132	128	128	126	123	121	15	15	15	14	14	14	14	13	3	3	4	4	4	4	5	5
Marshall Islands	–	–	–	–	–	–	–	–	431	381	382	358	263	256	242	281	47	44	43	41	30	29	28	32	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Micronesia	–	–	–	–	–	–	–	–	173	171	152	142	128	124	112	100	20	19	17	16	15	14	13	9	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Mongolia	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	297	273	258	258	233	232	217	234	37	36	34	35	29	28	21	29	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Nauru	–	–	–	–	–	–	–	–	44	56	57	48	162	121	174	33	4	8	5	5	19	6	24	3	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
New Caledonia	–	–	–	–	–	–	–	–	51	43	34	28	29	29	25	25	4	4	3	3	2	2	2	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
New Zealand	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	11	10	10	10	10	9	8	7	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Niue	–	–	–	–	–	–	–	–	< 1	< 1	506	< 1	< 1	< 1	< 1	< 1	< 1	< 1	82	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Northern Mariana Islands	–	–	–	–	–	–	–	–	135	120	95	83	80	83	83	72	10	13	8	9	7	6	8	7	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Palau	–	–	–	–	–	–	–	–	104	102	69	64	31	102	74	71	8	7	6	8	5	12	6	8	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Papua New Guinea	9	11	15	19	24	31	39	46	486	482	477	471	463	453	441	430	56	54	49	46	42	41	40	44	4	4	5	6	6	7	10	17
Philippines	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	600	578	561	542	534	520	505	500	57	53	50	46	45	43	41	41	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Rep. of Korea	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	113	112	126	108	112	118	122	126	9	8	9	9	9	10	10	10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Samoa	–	–	–	–	–	–	–	–	27	33	28	28	24	27	26	25	3	4	2	3	3	3	3	3	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Singapore	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	39	36	34	32	31	28	27	27	4	4	4	3	3	3	2	3	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Solomon Islands	–	–	–	–	–	–	–	–	300	286	277	254	229	204	197	180	33	32	30	28	26	24	23	21	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Tokelau	–	–	–	–	–	–	–	–	< 1	< 1	112	< 1	112	< 1	< 1	< 1	< 1	< 1	24	< 1	12	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Tonga	–	–	–	–	–	–	–	–	34	42	35	36	39	32	34	28	3	5	3	3	4	3	3	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Tuvalu	–	–	–	–	–	–	–	–	422	408	394	381	368	245	261	203	40	39	37	36	35	29	30	17	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Vanuatu	–	–	–	–	–	–	–	–	143	128	149	128	118	131	104	102	16	14	16	15	14	15	12	12	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Viet Nam	7	9	10	12	13	13	14	14	248	243	235	234	226	227	222	220	23	22	21	21	21	21	20	20	2	2	3	3	3	3	4	4
Wallis & Futuna	–	–	–	–	–	–	–	–	103	13	275	147	63	57	60	25	11	2	28	12	5	4	7	3	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
WPR	**2**	**2**	**2**	**3**	**3**	**3**	**3**	**3**	**260**	**255**	**250**	**235**	**218**	**207**	**201**	**197**	**20**	**20**	**19**	**18**	**17**	**16**	**16**	**16**	**< 1**	**< 1**	**< 1**	**< 1**	**< 1**	**< 1**	**< 1**	**< 1**

Rates are per 100 000 population (total country population, including HIV-positive and HIV-negative people). Estimates for all years are re-calculated as new information becomes available and techniques are refined, so they may differ from those published previously. Data (including for years 1990 to 1999) can be downloaded from www.who.int/tb

Table A3.5 **Case notifications and case detection rates, DOTS and non-DOTS combined, Western Pacific, 2007**

	Notified TB cases, DOTS and non-DOTS combined															Estimated incidence and case detection rates				Proportions			
					New pulmonary			New extra-	Other	Re-treatment cases					New pulm.	Estimated incidence		Case detection rate		ss+	ss+	Extrapulm.	Re-treat.
	Population	All notified	New and relapse		ss+		ss- / unk.	pulmonary	new	Relapse	After failure	After default	Other re-treat.	Other	lab. confirm.	all forms	ss+	all new	new ss+	(% of	(% of	(% of	(% of
	thousands	number	number	rate	number	rate	number	number	number	number	number	number	number	number	number	number	number	%	%	pulm.)	new+relapse)	new+relapse)	new+re-treat.)
American Samoa	67	3	3	4	0	0	3	0	0	0	0	0	0	0	0	3	0	90					
Australia	20 743	1 133	1 115	5	281	1	372	428	0	34	0	2	11	5	634	1 295	579	83	49	43	25	38	4
Brunei Darussalam	390	209	207	53	136	35	8	51	0	12	0	0	0	2	136	230	151	85	90	94	66	25	6
Cambodia	14 444	36 495	35 601	246	19 421	134	7 120	8 412		648	75	20	799		19 421	71 504	31 621	49	61	73	55	24	4
China	1 328 630	1 045 939	979 502	74	465 877	35	430 634	36 612	0	46 379	2 534	2 814	61 089	0	465 877	1 305 770	585 126	71	80	52	48	4	11
China, Hong Kong SAR	7 206	5 545	5 363	74	1 501	21	2 779	693	0	390	1	21	160	0	3 273	4 461	2 007	111	75	35	28	13	10
China, Macao SAR	481	401	342	71	138	29	147	29	0	28	0	4	14	41	250	301	135	104	102	48	40	8	13
Cook Islands	13															2	1						
Fiji	839	94	94	11	52	6	7	34	0	1	0	0	0	0	57	174	78	54	67	88	55	36	1
French Polynesia	263	64	64	24	19	7	32	11	0	2	0	0	0	0	62	71	21	87	90	37	30	17	3
Guam	173	54	53	31	5	3	43	4	0	1	0	0	1	0	38	59	6	88	90	10	9	8	4
Japan	127 967	25 311	24 779	19	9 433	7	9 051	5 142	0	1 153	0	0	532	0	14 657	26 994	12 135	88	78	51	38	21	7
Kiribati	95	352	334	351	103	108	78	147	0	6	0	0	18	0	103	347	156	95	66	57	31	44	7
Lao PDR	5 859	4 010	3 905	67	3 080	53	437	266	0	122	17	12	0	76	3 080	8 851	3 954	43	78	88	79	7	4
Malaysia	26 572	16 918	16 129	61	9 578	36	4 086	2 107	0	358	33	214	542	0	15 506	27 439	11 904	57	80	70	59	13	7
Marshall Islands	59	163	158	267	19	32	97	36	0	6	1	2	2	0	33	128	57	119	33	16	12	23	7
Micronesia	111	145	137	123	47	42	62	28	0	0	1	4	0	3	31	108	49	127	97	43	34	20	4
Mongolia	2 629	4 970	4 654	177	1 856	71	673	1 832	0	293	90	35	191	0	1 856	5 400	2 429	81	76	73	40	39	12
Nauru	10	4	3	30	3	30	0	0	0	0	0	0	1	0	0	3	3	90	90	100	100		25
New Caledonia	242	47	47	19	12	5	15	16	0	4	0	0	0	0	32	52	13	82	90	44	26	34	9
New Zealand	4 179	287	274	7	81	2	108	75	6	4	0	0	13	0	158	299	134	90	60	43	30	27	6
Niue	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
Northern Mariana Islands	84	44	44	52	14	17	28	2	0	0	0	0	0	0	14	49	16	90	90	33	32	5	
Palau	20	11	11	54	5	25	3	3	0	0	0	0	0	0	5	12	6	90	90	63	45	27	
Papua New Guinea	6 331	16 183	15 002	237	2 087	33	5 731	7 088	0	96			1 181		2 647	15 796	6 815	94	31	27	14	47	8
Philippines	87 960	142 576	140 588	160	86 566	98	49 422	1 513	0	3 087	479	535	974	0	86 464	255 084	114 701	54	75	64	62	1	4
Rep. of Korea	48 224	45 597	37 554	78	10 927	23	18 778	5 005	0	2 844	202	436	3 101	4 304	16 230	43 222	19 409	80	56	37	29	13	16
Samoa	187															35	16						
Singapore	4 436	1 405	1 359	31	504	11	564	181	0	110	1	6	32	7	861	1 176	525	106	96	47	37	13	11
Solomon Islands	496	397	397	80	142	29	147	99	0	9	0	0	0	0	142	634	285	61	50	49	36	25	2
Tokelau	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
Tonga	100	23	23	23	14	14	5	4	0	0	0	0	0	0	14	24	11	95	129	74	61	17	
Tuvalu	11	18	18	171	12	114	1	2	2	1	0	0	0	0	14	18	8	97	152	92	67	11	6
Vanuatu	226	122	122	54	41	18	38	43	0	0	0	0	0	0	79	174	78	70	52	52	34	35	
Viet Nam	87 375	98 344	97 400	111	54 457	62	17 554	18 675		6 714	599	345				149 588	66 109	61	82	76	56	19	8
Wallis & Futuna	15	2	2	13	1	7	1	0	0	0	0	0	0	0	1	2	1	90	90	50	50		
WPR	**1 776 440**	**1 446 866**	**1 365 284**	**77**	**666 412**	**38**	**548 024**	**88538**	**8**	**62 302**	**4 033**	**4 450**	**68 661**	**4 438**	**631 675**	**1 919 306**	**858 539**	**68**	**78**	**55**	**49**	**6**	**10**

ss+ indicates sputum smear-positive; ss-, sputum smear-negative; unk., sputum smear result unknown; re-treat., re-treatment; pulm. lab. confirmed, pulmonary case confirmed by positive smear or culture. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.6 **DOTS coverage, case notifications and case detection rates, Western Pacific, 2007**

	DOTS coverage	TB cases reported from DOTS services													Estimated incidence and case detection rate				Proportions			
		New and relapse		New pulmonary ss+		ss- / unk.	New extra-pulmonary	Other new	Re-treatment cases: Relapse	After failure	After default	Other re-treat.	Other	New pulm. lab. confirm.	Estimated incidence: all forms	ss+	DOTS case detection rate: all new	new ss+	ss+ (% of pulm.)	ss+ (% of new+relapse)	Extrapulm. (% of new+relapse)	Re-treat. (% of new+re-treat.)
	%	number	rate	number	rate	number	number	number	number	number	number	number	number	number	number	number	%	%				
American Samoa	100	3	4	0	0	3	0	0	0	0	0	0	0	0	3	0	90					
Australia	100	1 115	5	281	1	372	428	0	34	0	2	11	5	634	1 295	579	83	49	43	25	38	4
Brunei Darussalam	100	207	53	136	35	8	51	0	12	0	0	0	2	136	230	151	85	90	94	66	25	6
Cambodia	100	35 601	246	19 421	134	7 120	8 412		648	75	20	799		19 421	71 504	31 621	49	61	73	55	24	4
China	100	979 502	74	465 877	35	430 634	36 612	0	46 379	2 534	2 814	61 089	0	465 877	1 305 770	585 126	71	80	52	48	4	11
China, Hong Kong SAR	100	4 157	58	1 204	17	2 115	546	0	292	0	17	138	0	2 474	4 461	2 007	87	60	36	29	13	10
China, Macao SAR	100	342	71	138	29	147	29	0	28	0	4	14	0	250	301	135	104	102	48	40	8	13
Cook Islands															2	1						
Fiji	100	94	11	52	6	7	34	0	1	0	0	0	0	57	174	78	54	67	88	55	36	1
French Polynesia	100	64	24	19	7	32	11	0	2	0	0	0	0	62	71	21	87	90	37	30	17	3
Guam	100	53	31	5	3	43	4	0	1	0	0	1	0	38	59	6	88	90	10	9	8	4
Japan	99	24 674	19	9 400	7	9 021	5 102	0	1 151	0	0	527	0	14 597	26 994	12 135	87	77	51	38	21	7
Kiribati	100	334	351	103	108	78	147	0	6	0	0	18	0	103	347	156	95	66	57	31	44	7
Lao PDR	100	3 905	67	3 080	53	437	266	0	122	17	12	0	76	3 080	8 851	3 954	43	78	88	79	7	4
Malaysia	100	16 129	61	9 578	36	4 086	2 107	0	358	33	214	542	0	14 692	27 439	11 904	57	80	70	59	13	7
Marshall Islands	96	158	267	19	32	97	36	0	6	1	2	2	0	33	128	57	119	33	16	12	23	7
Micronesia	89	137	123	47	42	62	28	0	0	1	4	0	3	31	108	49	127	97	43	34	20	4
Mongolia	100	4 654	177	1 856	71	673	1 832	0	293	90	35	191	0	1 856	5 400	2 429	81	76	73	40	39	12
Nauru	100	3	30	3	30	0	0	0	0	0	0	1	0	0	3	3	90	90	100	100		25
New Caledonia	100	47	19	12	5	15	16	0	4	0	0	0	0	32	52	13	82	90	44	26	34	9
New Zealand	100	274	7	81	2	108	75	6	4	0	0	13	0	158	299	134	90	60	43	30	27	6
Niue	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
Northern Mariana Islands	100	44	52	14	17	28	2	0	0	0	0	0	0	14	49	16	90	90	33	32	5	
Palau	100	11	54	5	25	3	3	0	0	0	0	0	0	5	12	6	90	90	63	45	27	
Papua New Guinea	14	5 049	80	1 051	17	1 794	2 108	0	96					1 147	15 796	6 815	31	15	37	21	42	2
Philippines	100	140 588	160	86 566	98	49 422	1 513		3 087	479	535	974		86 464	255 084	114 701	54	75	64	62	1	4
Rep. of Korea	100	8 707	18	2 764	6	4 681	113	0	1 149	2	151	660	858	4 063	43 222	19 409	17	14	37	32	1	21
Samoa															35	16						
Singapore	100	1 359	31	504	11	564	181	0	110	1	6	32	7	861	1 176	525	106	96	47	37	13	11
Solomon Islands	100	397	80	142	29	147	99	0	9	0	0	0	0	142	634	285	61	50	49	36	25	2
Tokelau	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
Tonga	100	23	23	14	14	5	4	0	0	0	0	0	0	14	24	11	95	129	74	61	17	
Tuvalu	100	18	171	12	114	1	2	2	1	0	0	0	0	14	18	8	97	152	92	67	11	6
Vanuatu	83	122	54	41	18	38	43	0	0	0	0	0	0	79	174	78	70	52	52	34	35	
Viet Nam	100	97 400	111	54 457	62	17 554	18 675		6 714	599	345				149 588	66 109	61	82	76	56	19	8
Wallis & Futuna	100	2	13	1	7	1	0	0	0	0	0	0	0	1	2	1	90	90	50	50		
WPR	**100**	**1 325 173**	**75**	**656 883**	**37**	**529 296**	**78 479**	**8**	**60 507**	**3 832**	**4 161**	**65 012**	**951**	**616 335**	**1 919 306**	**858 539**	**66**	**77**	**55**	**50**	**6**	**10**

ss+ indicates sputum smear-positive; ss-, sputum smear-negative; unk., sputum smear result unknown; re-treat., re-treatment; pulm. lab. confirmed, pulmonary case confirmed by positive smear or culture. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.7 **Laboratory services, collaborative TB/HIV activities and management of MDR-TB, Western Pacific, 2006–2007**

	Laboratory services, 2007				Collaborative TB/HIV activities								Management of MDR-TB, 2007				
					2006				2007								
	Number of labs working with NTP			Smear labs included in EQA	TB pts tested for HIV	TB pts HIV-positive	HIV+ TB pts CPT	HIV+ TB pts ART	TB pts tested for HIV	TB pts HIV-positive	HIV+ TB pts CPT	HIV+ TB pts ART	Lab-confirmed MDR	DST in new cases	MDR in new cases	Re-treatment DST	Re-treatment MDR
	smear	culture	DST														
American Samoa					3	0	0	0	3	0	0	0	0	0	0	0	0
Australia	127	33	6	127	423	15	3	1	460	15			25	793	17	39	8
Brunei Darussalam	1	1	1	1	4	4	0	0	0	0	0	0	0	148	0	2	0
Cambodia	201	3	1	186	4 721	1 628	954	385	14 245	2 922	1 101	610	16	0	0	56	16
China	3 294	327	187	3 294	1 440	108	26	60	34 557	1 187	679	519	79	50	13	236	66
China, Hong Kong SAR	26	20	3	21	4 511	33	21	15	4 075	41	17	9	25	3 238	19	145	6
China, Macao SAR	1	1	1	1	399	4	0	2	360	4	0	1	5	251	4	31	1
Cook Islands					0	0	0	0									
Fiji	4	1	0	4	67	3	2	2	57	0			0	2	0	0	0
French Polynesia	3	2	2	2	26	0	0	0	19	0	0	0	0	42	0	2	0
Guam	3	2	2	3	40	0	0	0	58	0	0	0	0	38	0	1	0
Japan				0					16 104	75			58	4 457	26	443	32
Kiribati	2	0			0	0	0	0					0	0	0	0	0
Lao PDR	155	0	0	154	404	91	91	85	424	155	149	75	0	0	0	0	0
Malaysia	656	18	3		13 039	1 438	0	0	10 082	1 629	0	0	41				
Marshall Islands	3	1	1	3	103	0	0	0	98	0	0	0	1	29	0	10	1
Micronesia	4	0	0	4	18	0	0	0	11	0	0	0	1		1		
Mongolia	37	1	1	37	1	1	1	1		3	0	0	123	9	2	180	65
Nauru	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Caledonia	3	3	1	1	25	0	0	0	21	0	0	0	0	42	0	4	0
New Zealand	10	10	3		131	10			106	4			2	271	0	17	2
Niue	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Northern Mariana Islands	1	1	1	1	50	0	0	0	41	0	0	0	0	14	0	0	0
Palau	1	1	1	1	9	0	0	0	11	0	0	0	0	4	0	0	0
Papua New Guinea	70	1	0	34					117	17			0	0	0	0	0
Philippines	2 374	3	3	2 374	0	0		0	46	0		0	568	16	4	325	270
Rep. of Korea	260	12	1														
Samoa					0	0	0	0									
Singapore	4	2	2	4									4	827	3	105	1
Solomon Islands	9	0	0	0	4	0	0	0	3	0	0	0	0	0	0	0	0
Tokelau					0	0	0	0	0	0	0	0	0	0	0	0	0
Tonga	1	1	0	1	0	0	0	0	23	0	0	0	0	0	0	0	0
Tuvalu	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Vanuatu	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0
Viet Nam	737	17	2		14 230	708			14 377	627							
Wallis & Futuna	1	1	1	1	2	0	0	0	2	0	0	0	0	0	0	0	0
WPR	**7 997**	**463**	**224**	**6 262**	**39 650**	**4 043**	**1 098**	**551**	**95 300**	**6 679**	**1 946**	**1 214**	**948**	**10 231**	**89**	**1 596**	**468**

ART indicates antiretroviral therapy; CPT, co-trimoxazole preventive therapy; DST, drug susceptibility testing; EQA, external quality assurance; HIV+, HIV-positive; pts, patients. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.8 **Treatment outcomes, Western Pacific, 2006 cohort**

	New smear-positive cases, DOTS											New smear-positive cases, non-DOTS											Smear-positive re-treatment cases, DOTS								
	Number of cases		% of notif	% of cohort							%	Number of cases		% of notif	% of cohort							%	Number	% of cohort							%
	Notified	Regist'd	regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	Success	Notified	Regist'd	regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	Success	Regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	Success
American Samoa	3	0																					0							0	
Australia	238	370	155	13	72	6	0	1	8	0	85	31											67	7	79	4	0	1	7	0	87
Brunei Darussalam	128	153	120	84	0	5	0	0	11	0	84												3	100	0	0	0	0	0	0	100
Cambodia	19 294	19 349	100	90	3	3	0	2	2	0	93												1 389	48	37	6	2	2	4	0	85
China	468 291	470 436	100	92	2	1	1	1	3	0	94												78 146	85	5	2	2	1	5	0	89
China, Hong Kong SAR	1 238	1 238	100	72	6	5	11	3	2	1	78	299	299	100	3	1	2	1	0	2	91	4	509	47	25	5	13	7	2	2	72
China, Macao SAR	144	144	100	88	0	4	0	3	2	3	88												33	45	45	3	0	0	0	6	91
Cook Islands	0																														
Fiji	73	73	100	66		4		30		0	66																				
French Polynesia	24	26	108	85	0	12	0	4	0	0	85												4	50	0	50	0	0	0	0	50
Guam	21	21	100	90	0	5	0	0	5	0	90												0							0	
Japan	10 068	8 562	85	20	33	21	2	6	3	15	53	91	47	52	9	19	32	0	13	2	26	28	1 029	13	31	12	2	9	1	32	45
Kiribati	129	126	98	61	29	10	0	1	0	0	90												15	20	60	7	0	13	0	0	80
Lao PDR	3 041	3 047	100	88	3	5	0	2	1	0	92												170	78	5	8	4	2	4	0	82
Malaysia	9 414	9 414	100	46	3	6	0	3	3	40	48												995	19	17	5	1	6	6	47	35
Marshall Islands	45	44	98	73	2	11			7	7	75												16	31	6	6	0	0	0	56	38
Micronesia	41	78	190	60	29	6	1	1	1	0	90												2	50	0	0	0	0	0	50	50
Mongolia	2 129	2 129	100	84	4	2	7	2	1	0	88												531	41	30	9	12	5	2	1	72
Nauru	2	2	100	50	50	0	0	0	0	0	100												0							0	
New Caledonia	9	9	100	89		11				0	89												7	71	0	29	0	0	0	0	71
New Zealand	97	101	104		70	7		4	11	8	70												20	0	90	10	0	0	0	0	90
Niue	0	0																					0							0	
Northern Mariana Islands	15	26	173	42	42	0	0	0	15	0	85												0							0	
Palau	6	5	83	40	20	20	0	0	20	0	60												0							0	
Papua New Guinea	1 481	1 494	101	59	15	3	2	21	0	0	73	467																			
Philippines	85 740	85 797	100	80	8	2	1	4	2	2	88												3 293	63	17	5	4	5	2	3	80
Rep. of Korea	3 431	3 422	100	78	2	1	1	3	15	0	81	8 082											2 261	69	3	1	1	5	21	0	72
Samoa	13																														
Singapore	537	537	100	70	14	14	0	1	0	1	84												164	47	29	18	0	4	1	1	76
Solomon Islands	124	124	100	73	16	3	1	5	2	0	90												5	60	40	0	0	0	0	0	100
Tokelau	0	0																					0							0	
Tonga	14	14	100	100	0	0	0	0	0	0	100												0							0	
Tuvalu	4	4	100	75		0	0	25	0	0	75												0							0	
Vanuatu	42	42	100	88	2	2	2	0	5	0	90												0							0	
Viet Nam	56 437	56 470	100	90	2	3	1	2	2	1	92												7 500	79	4	6	5	3	3	0	83
Wallis & Futuna	0	4		50	50	0	0	0	0	0	100												0							0	
WPR	**662 273**	**663 261**	**100**	**89**	**3**	**2**	**1**	**1**	**3**	**1**	**92**	**8 970**	**346**	**4**	**4**	**3**	**6**	**1**	**2**	**2**	**82**	**8**	**96 159**	**80**	**6**	**3**	**3**	**2**	**5**	**1**	**87**

Not eval. indicates not evaluated (percentage of registered cases for which outcomes were not recorded); success, sum of cured and completed; cases regist'd, the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2006 is used as the denominator for calculating treatment outcomes unless it is less than the sum of outcomes, in which case the sum of outcomes is used. If the number of cases registered is not reported, then the number of cases notified in 2006 is used, or the sum of outcomes if the latter is greater. Data can be downloaded from www.who.int/tb

Table A3.9 **DOTS re-treatment outcomes, Western Pacific, 2006 cohort**

	Relapse, DOTS									After failure, DOTS									After default, DOTS								
		% of cohort									% of cohort									% of cohort							
	Number regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	% Success	Number regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	% Success	Number regist'd	Cured	Compl-eted	Died	Failed	Default	Trans-ferred	Not eval.	% Success
American Samoa	0									0									0								
Australia	54	9	76	6	0	2	7	0	85	0									1	0	0	0	0	0	100	0	0
Brunei Darussalam	3	100	0	0	0	0	0	0	100	0									0								
Cambodia	660	80	5	7	2	3	3	0	85	51	51	4	14	27	4	0	0	55	17	76	18	6	0	0	0	0	94
China	47 526	85	5	2	2	1	5	0	89																		
China, Hong Kong SAR	312	68	7	6	10	6	1	2	75	0									25	20	4	12	24	32	4	4	24
China, Macao SAR	25	44	44	4	0	0	0	8	88	0									7	57	43	0	0	0	0	0	100
Cook Islands																											
Fiji																											
French Polynesia	4	50	0	50	0	0	0	0	50	0									0								
Guam	0									0									0								
Japan	688	18	37	15	3	8	1	18	54																		
Kiribati	4	75	0	25	0	0	0	0	75	0									0								
Lao PDR	133	78	5	8	4	2	2	0	83	17	65	0	18	6	0	12	0	65	20	85	5	0	0	5	5	0	90
Malaysia	381	35	3	5	0	5	5	46	38	23	26	17	17	0	13	9	17	43	164	26	9	4	1	6	5	49	34
Marshall Islands	16	31	6	6				56	38																		
Micronesia	2	50	0	0	0	0	0	50	50										0								
Mongolia	274	52	16	12	12	4	3	1	68	91	47	20	7	20	4	1	1	67	35	40	26	9	9	11	6	0	66
Nauru	0									0									0								
New Caledonia	5	60		40				0	60																		
New Zealand	9		89	11				0	89																		
Niue	0									0									0								
Northern Mariana Islands	0									0									0								
Palau	0									0									0								
Papua New Guinea																											
Philippines	2 225	67	15	5	4	4	3	3	82	597	55	18	5	9	6	4	2	74	242	53	25	10	3	9	0	0	78
Rep. of Korea	1 174	64	2	2	1	5	27	0	66	0									120	53	4	0	1	23	19	0	57
Samoa																											
Singapore	109	57	16	24	0	2	0	2	72	4	100	0	0	0	0	0	0	100	16	69	25	0	0	0	6	0	94
Solomon Islands	5	60	40	0	0	0	0	0	100	0									0								
Tokelau	0									0									0								
Tonga	0									0									0								
Tuvalu	0									0									0								
Vanuatu	0									0									0								
Viet Nam	6 571	81	4	6	4	3	3	0	85	558	64	3	5	16	5	6	1	67	363	58	17	10	1	10	3	0	75
Wallis & Futuna	0									0									0								
WPR	**60 180**	**82**	**6**	**3**	**3**	**2**	**5**	**1**	**87**	**1 341**	**58**	**11**	**6**	**13**	**6**	**4**	**2**	**69**	**1 010**	**50**	**16**	**7**	**2**	**11**	**5**	**8**	**66**

Not eval. indicates not evaluated (percentage of registered cases for which outcomes were not recorded); success, sum of cured and completed; cases regist'd, the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2006 is used as the denominator for calculating treatment outcomes unless it is less than the sum of outcomes, in which case the sum of outcomes is used. If the number of cases registered is not reported, then the number of cases notified in 2006 is used, or the sum of outcomes if the latter is greater. Data can be downloaded from www.who.int/tb

Table A3.10 **DOTS treatment success and case detection rates, Western Pacific, 1994–2007**

	DOTS new smear-positive treatment success (%)													DOTS new smear-positive case detection rate (%)												
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
American Samoa		100			50	100	100	100	100	100	67	75				90		90	90	90	90	90	90	90	90	
Australia				66	75	84	74	66	78	82	85	80	85				22	29	23	19	25	9	32	39	42	49
Brunei Darussalam					85	76	63	56	84	60	71	71	84					90	90	90	90	90	90	90	90	90
Cambodia	84	91	94	91	95	93	91	92	92	93	91	93	93	40	34	44	48	54	50	48	57	62	62	68	62	61
China	94	96	96	96	97	96	95	96	93	94	94	94	94	15	29	32	32	30	31	31	30	43	64	80	80	80
China, Hong Kong SAR					85	78	76	78	79	78	80	77	78					64	67	61	65	66	64	61	60	60
China, Macao SAR	75			81		78	89	86	89	88	89	93	88	88	136	164	150		95	98	90	99	101	107	110	102
Cook Islands	100	100	100	100		67			100			100		90	90	90				90	90		90	90		
Fiji	90	86	86	91	90	92	85	85	78	86		71	66	51	54	54	63	58	58	71	75	83	69	74	90	67
French Polynesia		67	95	100	74	85	97	80	82	83	80	89	85		90	90	90	90	90		90	90	90	90	90	90
Guam						94	93	71	68	96	100	85	90						90	90	90		90	90	90	90
Japan						76	70	75	76	76	57	60	53						23	32	37	46	51	67	78	77
Kiribati					83	88	91	86	94	88	94	93	90			7	33	37	34	40	52	63	90	79	82	66
Lao PDR		70	55	65	80	79	77	76	75	79	86	90	92		24	33	40	45	40	41	48	48	57	72	77	78
Malaysia		69				90	78	79	76	72	56	70	48	64	68				73	73	70	69	67	72	80	80
Marshall Islands					83	82	91	86	100	90	90	87	75				18	29	19	26	31	35	68	84	79	33
Micronesia	64	80				95	93	100	91	92	80	50	90	12	19				24	13	38	47	65	62	82	97
Mongolia			78	86	84	86	87	87	87	87	88	88	88	8	6	31	60	67	61	71	72	66	77	78	88	76
Nauru						50	25	100	50			67	100						90	90	90	90			90	90
New Caledonia	62	75			70	77	89	84	85	75	94	94	89	90	90			90	90	90	90	90	90	90	90	90
New Zealand							30	9	60	36	68	60	70						40	41	51	62	65	50	65	60
Niue									100												90					
Northern Mariana Islands						80	81	74	71	75	88	73	85						90	90	90	90	90	90	90	90
Palau	64	67	75					100	38	80	100	100	60	90	90	90					90	90	90	90	90	90
Papua New Guinea				93	72	66	63	67	53	58	65	71	73			1	7	8	7	8	15	17	18	20	22	15
Philippines	80		82	83	84	87	88	88	88	88	87	89	88	0	0	3	9	18	44	52	57	64	69	71	75	75
Rep. of Korea	71	76	71	82					83	82	80	83	81	30	60	56	62					26	23	20	18	14
Samoa	50	80	100		86	94	92	77	84		100	91		73	45	71		89	70	60	107	69	65	66	80	
Singapore	88	86				95	85	88	87	77	81	83	84	62	27				16	28	51	57	87	102	101	96
Solomon Islands		65	73	92	92		81	89	90	87	87	85	90		24	30	39	26	32	35	33	43	49	56	42	50
Tokelau																										
Tonga	89	75	82	75	94	80	93	92	83			73	100	67	106	85	126	80	123	67	196	95	70	98	127	129
Tuvalu											100	100	75											60	49	152
Vanuatu						88	88	88	79	75	90	81	90					28	31	58	38	49	73	44	53	52
Viet Nam	91	91	90	85	93	92	92	93	92	92	93	92	92	30	59	78	83	83	82	84	87	86	89	84	86	82
Wallis & Futuna								100	100		100		100							90	90	90		90		90
WPR	**90**	**91**	**93**	**93**	**95**	**94**	**92**	**93**	**90**	**91**	**91**	**92**	**92**	**15**	**28**	**31**	**33**	**31**	**37**	**38**	**39**	**50**	**65**	**77**	**77**	**77**

Treatment success, sum of cured and completed; DOTS new smear-positive case detection rate, notified new smear-positive cases divided by estimated incident cases. Figures for all years are updated as new information becomes available and/or techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.11 **New smear-positive case notification by age and sex, DOTS and non-DOTS, Western Pacific, 2007**

	Male							Female							All							Male/female
	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+	ratio
American Samoa																						
Australia	3	30	33	20	15	14	37	4	26	37	20	12	7	23	7	56	70	40	27	21	60	1.2
Brunei Darussalam	0	5	10	15	21	10	17	0	6	6	12	15	9	2	0	11	16	27	36	19	19	1.6
Cambodia	50	883	1 526	2 190	2 102	1 761	1 644	64	749	1 351	1 698	2 105	1 839	1 459	114	1 632	2 877	3 888	4 207	3 600	3 103	1.1
China	878	44 011	46 374	56 224	54 960	56 288	70 376	1 235	29 960	24 914	23 542	18 129	17 647	21 339	2 113	73 971	71 288	79 766	73 089	73 935	91 715	2.4
China, Hong Kong SAR	5	63	80	110	177	175	425	1	59	94	74	64	37	137	6	122	174	184	241	212	562	2.2
China, Macao SAR	0	14	12	14	30	16	13	2	10	4	6	8	3	6	2	24	16	20	38	19	19	2.5
Cook Islands																						
Fiji	1	7	7	7	4	1	4	7	11	4	6	5	1	2	8	18	11	13	9	2	6	0.9
French Polynesia			2	2	2			1	1	1	5	0	3	2	1	1	3	7	2	3	2	0.5
Guam	0	0	0	2	0	0	0	0	0	0	0	1	1	1	0	0	0	2	1	1	1	0.7
Japan	1	142	372	512	668	1 174	3 678	3	134	318	231	156	212	1 832	4	276	690	743	824	1 386	5 510	2.3
Kiribati	2	15	7	10	6	10	3	8	13	6	8	9	4	2	10	28	13	18	15	14	5	1.1
Lao PDR	11	150	258	307	418	361	350	7	126	175	215	293	206	207	18	276	433	522	711	567	557	1.5
Malaysia	216	1 291	2 224	2 082	1 839	1 394	1 395	226	1 098	1 101	849	782	585	514	442	2 389	3 325	2 931	2 621	1 979	1 909	2.0
Marshall Islands	0	1	1	2	5	1	0	1	3	3	2	3	3	0	1	4	4	4	8	4	0	0.7
Micronesia	1	8	5	4	0	1	0	5	11	6	2	2	2	0	6	19	11	6	2	3	0	0.7
Mongolia	4	280	270	232	158	48	34	23	273	250	139	80	36	29	27	553	520	371	238	84	63	1.2
Nauru	1	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	
New Caledonia	0	1	1	2	1	3	2	0	0	0	1	0	0	1	0	1	1	3	1	3	3	5.0
New Zealand	0	11	1	7	4	4	8	1	14	7	8	6	6	4	1	25	8	15	10	10	12	0.8
Niue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Northern Mariana Islands	0	0	0	3	4	0	2	0	0	2	1	1	1	2	0	0	2	4	5	1	4	1.3
Palau	0	0	1	0	2	1	0	0	0	0	0	0	1	0	0	0	1	0	2	2	0	4.0
Papua New Guinea	16	178	171	112	67	50	6	32	148	153	84	36	15	3	48	326	324	196	103	65	9	1.3
Philippines	466	8 524	11 781	13 810	12 846	8 481	4 862	380	4 389	5 594	5 291	4 612	3 313	2 217	846	12 913	17 375	19 101	17 458	11 794	7 079	2.4
Rep. of Korea	16	589	953	1 144	1 308	906	1 684	34	570	807	466	387	347	1 716	50	1 159	1 760	1 610	1 695	1 253	3 400	1.5
Samoa																						
Singapore	0	15	18	63	98	80	105	1	13	13	25	23	11	39	1	28	31	88	121	91	144	3.0
Solomon Islands	5	15	16	12	9	8	6	5	12	25	9	10	5	5	10	27	41	21	19	13	11	1.0
Tokelau	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Tonga	0	2	1	0	0	1	5	0	3	1	1	0	0	0	0	5	2	1	0	1	5	1.8
Tuvalu	1	1	0	2	0	0	2	2	0	0	0	1	3	0	3	1	0	2	1	3	2	1.0
Vanuatu	1	3	2	4	2	2	2	1	6	8	1	6	1	2	2	9	10	5	8	3	4	0.6
Viet Nam	48	3 587	7 431	8 391	8 451	5 046	7 026	59	1 939	2 354	1 923	2 170	1 891	4 144	107	5 526	9 785	10 314	10 621	6 937	11 170	2.8
Wallis & Futuna	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
WPR	**1 726**	**59 827**	**71 557**	**85 284**	**83 198**	**75 836**	**91 686**	**2 102**	**39 574**	**37 234**	**34 619**	**28 916**	**26 189**	**33 688**	**3 828**	**99 401**	**108 791**	**119 903**	**112 114**	**102 025**	**125 374**	**2.3**

For some countries, breakdown of notified cases by age and sex is missing, or is provided for a subset of cases. See Explanatory notes for further details. Data can be downloaded from www.who.int/tb

Table A3.12 **New smear-positive case notification rates by age and sex, DOTS and non-DOTS, Western Pacific, 2007**

	Male							Female							All						
	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+	0–14	15–24	25–34	35–44	45–54	55–64	65+
American Samoa																					
Australia	0	2	2	1	1	1	3	0	2	3	1	1	1	2	0	2	2	1	1	1	2
Brunei Darussalam	0	14	27	51	91	85	262	0	18	15	40	84	122	33	0	16	21	46	88	99	152
Cambodia	2	51	158	294	425	607	1008	3	44	137	202	337	450	476	2	47	147	245	376	515	660
China	1	38	44	46	63	95	140	1	28	25	20	22	31	39	1	33	35	33	43	64	87
SAR	1	14	16	19	29	47	105	0	13	16	10	9	10	29	1	14	16	14	19	29	64
China, Macao SAR	0	34	40	39	66	62	80	6	24	11	12	17	14	29	3	29	24	23	41	40	52
Cook Islands																					
Fiji	1	8	11	14	9	4	24	5	14	7	12	11	3	9	3	11	9	13	10	4	16
French Polynesia			10	9	13			3	4	5	25	0	36	26	1	2	8	17	7	17	14
Guam	0	0	0	15	0	0	0	0	0	0	0	10	15	16	0	0	0	8	5	7	9
Japan	0	2	4	6	8	13	33	0	2	4	3	2	2	12	0	2	4	4	5	7	21
Kiribati																					
Lao PDR	1	23	60	104	200	359	383	1	19	40	69	135	180	180	1	21	50	86	167	264	270
Malaysia	5	50	105	115	127	166	249	6	44	53	48	57	73	80	5	47	79	82	93	121	159
Marshall Islands																					
Micronesia	5	60	67	81	0	38	0	24	91	84	37	44	76	0	14	74	76	58	22	57	0
Mongolia	1	92	112	124	134	90	76	7	92	105	73	64	62	48	4	92	109	98	98	76	60
Nauru																					
New Caledonia	0	5	5	11	7	30	26	0	0	0	5	0	0	11	0	2	3	8	4	16	18
New Zealand	0	4	0	2	1	2	3	0	5	3	3	2	3	1	0	4	1	2	2	2	2
Niue																					
Islands																					
Palau																					
Guinea	1	28	36	31	29	40	8	3	25	32	22	15	12	4	2	26	34	26	22	26	6
Philippines	3	96	170	269	354	385	312	2	51	82	104	124	145	114	3	74	126	187	238	263	202
Rep. of Korea	0	17	24	27	35	40	83	1	18	21	11	11	15	59	1	17	23	20	23	27	69
Samoa																					
Singapore	0	5	6	16	24	32	57	0	5	5	6	6	4	18	0	5	6	11	15	18	36
Solomon Islands	5	29	38	46	57	81	80	5	25	66	35	62	51	68	5	27	51	40	59	66	74
Tokelau																					
Tonga	0	17	14	0	0	42	168	0	29	15	22	0	0	0	0	23	15	11	0	19	76
Tuvalu																					
Vanuatu	2	12	13	32	24	38	51	2	26	50	8	74	21	57	2	19	31	20	48	30	54
Viet Nam	0	39	100	140	199	241	310	0	22	32	31	50	86	159	0	31	66	85	123	161	229
Wallis & Futuna																					
WPR	**1**	**39**	**51**	**56**	**74**	**96**	**130**	**1**	**28**	**28**	**24**	**27**	**34**	**41**	**1**	**34**	**40**	**40**	**51**	**66**	**83**

Rates are per 100 000 population of each age/sex group. Rates are calculated excluding those countries for which breakdown of notified cases or population by age and sex is missing. Data can be downloaded from www.who.int/tb

Table A3.13 **TB case notifications, Western Pacific, 1980–2007**

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
American Samoa	2	6	6	8	12	5	8	9	13	5	9	3	1	4	4		0	6	3	4	3	3	2	3	5	6	4	3
Australia	1 457	1 386	1 270	1 219	1 299	1 088	906	907	954	952	1 016	950	1 011	991	1 057	1 073		1 145	899	1 073	1 043	980	1 013	949	1 059	1 046	1 159	1 115
Brunei Darussalam	196	285	245	276	256	238	212	189	126	128	143		180	160				160		272	307	216	230	206	176	163	202	207
Cambodia	2 576	1 980	8 158	7 572	10 241	10 145	10 325	9 106	10 691	7 906	6 501	10 903	16 148	13 270	15 172	14 603	14 857	15 629	16 946	19 266	18 891	19 170	24 610	28 216	30 838	35 535	34 660	35 601
China	0		98 654	117 557	151 564	226 899	265 095	251 600	304 639	310 607	375 481	345 000	320 426	344 218	363 804	515 764	504 758	466 394	445 704	449 518	454 372	470 221	462 609	615 868	790 603	894 428	940 889	979 502
China, Hong Kong SAR	8 065	7 729	7 527	7 301	7 843	7 545	7 432	7 269	7 021	6 704	6 510	6 283	6 534	6 537	6 319	6 212	6 501	7 072	7 673	5 605	6 015	6 788	6 277	5 914	5 684	5 660	5 536	5 363
China, Macao SAR	1 101	585	233	455	671	571	420	389	320	274	343	329	294	285		402	570	575	465		449	465	388	371	309	355	374	342
Cook Islands	8	2	12	15	3	8	3	2	0	2	0	1	6	5	4	2	1	2	0	3	1	2	1	0	1	1	1	
Fiji	210	180	163	185	165	230	199	173	162	218	226	247	240	183	225	203	200	171	166	192	144	183	148	185	134	132	114	94
French Polynesia	76	66	65	78	80	78	85	80	63	73	59	49	83	78	89		86	91	105	93	62	62	64	50	60	63	69	64
Guam	55	41	49	48	54	37	49	34	41	75			60	70	94						54	63	51	22	50	63	44	53
Japan	70 916	65 867	63 940	62 021	61 521	58 567	56 690	56 496	54 357	53 112	51 821	50 612	48 956	48 461	44 425	43 078	42 122	42 190	44 016	40 800	39 384	35 489	32 828	31 638	29 736	27 194	25 304	24 779
Kiribati	146	187	193	127	111	103	129	110	208	121	68	91	100	99	253		327	464	276	255	252	189	196	284	310	332	378	334
Lao PDR	7 630		4 706	4 700	6 528	4 258	1 514	3 468	7 279	2 952	1 826	1 951	994	2 093	1 135	830	1 440	1 923	2 149	2 420	2 227	2 418	2 621	2 748	3 162	3 777	3 958	3 905
Malaysia	11 218	10 970	11 944	11 634	10 577	10 569	10 735	11 068	10 944	10 686	11 702	11 059	11 420	12 285	11 708	11 778	12 691	13 539	14 115	14 908	15 057	14 830	14 389	15 671	14 986	15 342	16 051	16 129
Marshall Islands	6	7	12	15	12	15	37	32	11	7		26	52	61			59		49	41	34	56	51	60	117	111	138	158
Micronesia	0		67	73	75	66	60	98	77	68	367	350	111	151	173	172	126	107	123		91	104	127	99	118	98	104	137
Mongolia	1 160	1 094	1 325	1 514	1 652	2 994	2 819	2 433	2 538	2 233	1 659	1 611	1 516	1 418	1 730	2 780	4 062	3 592	2 915	3 348	3 109	3 526	3 829	3 918	4 542	4 601	5 049	4 654
Nauru	0	2	8	0	0	0	8	6	8	0	7				4					2	4	3	5	3		11	12	3
New Caledonia	108	128	120	171	144	104	98	74	111	128	143	140	140	104	97	87	104	88	90	78	94	61	65	38	61	47	48	47
New Zealand	474	448	437	415	404	359	320	296	295	303	348	335	317	274	352	391	352	321	365	447	344	377	329	386	371	332	344	274
Niue	1	0	2	3	1	0	5	0	3		0		2	1	2	0	2	0	0	1	0	0	4	0	0	0	0	0
Northern Mariana Islands	0	26	75	74	58	64	16	56	27	28	28		67		46	48	51	93	97	66	75	58	53	45	53	57	51	44
Palau	17	10	17	14	20	26	13	38	17	3		6	4	25	41	19	5	15		32			11	9	5	10	12	11
Papua New Guinea	2 525	2 508	2 742	2 955	3 505	3 453	2 877	2 251	4 261	3 396	2 497	3 401	2 540	7 451	5 335	8 041	3 195	7 977	11 291	13 003	10 520	12 658	11 197	12 798	12 743	12 564	12 620	15 002
Philippines	112 307	116 821	104 715	106 300	151 863	151 028	153 129	163 740	183 113	217 272	317 008	207 371	236 172	178 134	180 044	119 186	165 453	195 767	162 360	145 807	119 914	107 133	118 408	132 759	130 530	137 100	147 305	140 588
Rep. of Korea	89 803	98 532	100 878	91 572	85 669	87 169	88 789	87 419	74 460	70 012	63 904	57 864	48 070	46 999	38 155	42 117	39 315	33 215	34 661	32 075	21 782	37 268	34 967	33 843	34 389	38 290	37 861	37 554
Samoa	59	49	43	41	37	43	65	29	29	37	44	44	26	49	45	45	31	32	22	31	43	22	31	27	34	24	25	
Singapore	2 710	2 425	2 179	2 065	2 143	1 952	1 760	1 616	1 666	1 617	1 591	1 841	1 778	1 830	1 677	1 889	1 951	1 977	2 120	1 805	1 728	1 536	1 516	1 581	1 414	1 356	1 313	1 359
Solomon Islands	266	313	324	302	337	377	292	334	372	488	382	309	364	367	332	352	299	318	295	289	302	292	256	293	340	397	371	397
Tokelau	0	1	0	0	0	2	0	9	1	0	1	1	1		0	2	0			0	0	0		0		0	0	0
Tonga	64	49	45	50	54	49	35	24	14	36	23	20	29	33	23	20	22	21	30	22	24	12	29	16	12	18	18	23
Tuvalu	33	18	12	23	9	32	27	22	24	26	23	30	30	28	19	36			18	14	16	16	13	30		12	9	18
Vanuatu	178	92	173	196	188	124	131	90	118	144	140	230	193	114	152	79	126	184	178	120	152	175	101	104	115	76	126	122
Viet Nam	43 062	43 506	51 206	43 185	43 875	46 941	47 557	55 505	52 463	52 270	50 203	59 784	56 594	52 994	51 763	55 739	74 711	77 838	87 468	88 879	89 792	90 728	95 044	92 741	98 173	94 916	97 363	97 400
Wallis & Futuna	23	24	5	17	14	14		34	1	30		22	4	11	11	6	8	14				1	19	15		7		2
WPR	**356 452**	**355 337**	**461 550**	**462 181**	**540 985**	**615 153**	**651 840**	**655 006**	**716 427**	**741 913**	**894 073**	**760 863**	**754 463**	**718 783**	**724 290**	**824 954**	**873 425**	**870 920**	**834 599**	**820 469**	**786 285**	**805 105**	**811 482**	**980 890**	**1 160 130**	**1 274 124**	**1 331 512**	**1 365 284**
Number reporting	36	33	36	36	36	36	35	36	36	35	32	31	35	33	33	29	31	31	30	32	34	35	35	36	32	36	35	34
% reporting	100	92	100	100	100	100	97	100	100	97	89	86	97	92	92	81	86	86	83	89	94	97	97	100	89	100	97	94

From 1995 on, number shown is all notified new and relapse cases (DOTS and non-DOTS). Figures for all years are updated as new information becomes available, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.14 **TB case notification rates, Western Pacific, 1980–2007**

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
American Samoa	6	18	17	22	32	13	19	21	29	11	19	6	2	8	8		0	11	5	7	5	5	3	5	8	9	6	4
Australia	10	9	8	8	8	7	6	6	6	6	6	6	6	6	6	6		6	5	6	5	5	5	5	5	5	6	5
Brunei Darussalam	102	143	120	131	118	107	92	80	52	51	56		66	57				52		84	92	63	66	58	48	44	53	53
Cambodia	38	29	114	102	132	125	123	104	118	84	67	109	155	124	137	128	127	130	138	154	148	147	186	209	225	255	244	246
China			10	11	14	21	24	23	27	27	33	30	27	29	30	42	41	38	36	36	36	37	36	47	61	68	71	74
China, Hong Kong SAR	160	150	144	137	145	138	135	131	126	119	114	109	111	109	104	100	103	111	118	85	90	101	92	86	81	80	78	74
China, Macao SAR	437	226	87	163	229	186	131	117	92	76	92	86	75	72		98	136	136	108		102	104	85	80	66	75	78	71
Cook Islands	45	11	68	85	17	45	17	11	0	11	0	6	33	28	22	11	6	11	0	18	6	13	7	0	7	7	7	
Fiji	33	28	24	27	24	32	28	24	23	30	31	34	32	24	30	26	26	22	21	24	18	23	18	23	16	16	14	11
French Polynesia	50	42	41	47	47	45	48	44	34	38	30	25	41	38	42		39	41	46	40	26	26	26	20	24	25	27	24
Guam	52	38	44	42	46	31	40	27	32	57			43	50	66						35	40	32	13	30	37	26	31
Japan	61	56	54	52	51	48	47	46	44	43	42	41	39	39	36	34	33	33	35	32	31	28	26	25	23	21	20	19
Kiribati	267	333	335	214	182	164	200	166	304	172	95	124	135	132	332		417	582	340	309	300	221	225	320	343	361	404	351
Lao PDR	246		145	141	191	121	42	93	190	75	45	46	23	47	25	18	30	39	43	47	43	45	49	50	57	67	69	67
Malaysia	82	78	83	78	69	67	67	67	64	61	65	59	60	63	58	57	60	62	64	66	65	62	59	63	59	60	61	61
Marshall Islands	20	22	36	43	33	39	92	76	25	15		54	105	122			115		95	79	65	106	95	110	211	196	238	267
Micronesia			86	91	90	77	68	109	84	72	381	354	110	146	163	160	117	99	114		85	97	118	91	108	89	94	123
Mongolia	70	64	76	84	89	157	143	120	121	103	75	71	66	61	73	116	169	148	119	136	126	142	153	155	178	178	194	177
Nauru	0	26	104	0	0	0	96	70	91	0	77				41					20	40	30	50	30		109	118	30
New Caledonia	76	88	81	114	94	67	62	46	68	76	84	80	78	57	51	45	53	44	44	37	44	28	29	17	26	20	20	19
New Zealand	15	14	14	13	13	11	10	9	9	9	10	10	9	8	10	11	9	9	10	12	9	10	8	10	9	8	8	7
Niue	29	0	64	100	35	0	190	0	125		0		89	44	88	0	91	0	0	51	0	0	228	0	0	0	0	0
Northern Mariana Islands		139	355	308	214	213	49	157	70	68	64		135		83	83	85	149	150	99	109	81	72	59	68	71	62	52
Palau	139	80	134	108	150	191	94	269	118	21		39	25	155	247	111	29	83		169			56	45	25	50	59	54
Papua New Guinea	79	77	82	86	99	95	77	59	109	84	60	80	58	167	116	171	66	161	221	248	195	229	198	221	215	207	203	237
Philippines	234	237	207	205	286	278	275	287	314	363	518	331	368	272	268	174	236	273	222	195	157	138	149	164	158	162	171	160
Rep. of Korea	236	255	257	230	212	214	215	210	177	165	149	134	110	106	86	94	87	73	75	69	47	79	74	71	72	80	79	78
Samoa	38	32	28	26	24	27	41	18	18	23	27	27	16	30	27	27	18	19	13	18	24	12	17	15	19	13	13	
Singapore	112	98	86	80	81	72	64	57	58	55	53	59	56	56	50	54	54	53	56	46	43	37	36	37	33	31	30	31
Solomon Islands	116	132	132	119	128	139	104	116	125	160	122	96	110	107	94	97	80	83	75	71	73	68	58	65	74	84	77	80
Tokelau	0	64	0	0	0	126	0	559	62	0	62	63	64		0	135	0			0	0	0		0		0	0	0
Tonga	66	51	47	53	58	53	38	26	15	38	24	21	30	34	24	21	23	21	31	22	24	12	29	16	12	18	18	23
Tuvalu	410	221	145	274	106	370	307	245	263	280	244	315	312	289	195	367			179	138	157	156	126	290		115	86	171
Vanuatu	152	77	141	156	146	94	97	65	83	99	94	150	122	70	90	46	72	103	98	65	80	90	51	51	55	35	57	54
Viet Nam	81	80	93	76	76	79	79	90	83	81	76	88	82	75	72	76	100	103	114	114	114	113	117	112	117	112	113	111
Wallis & Futuna	200	200	40	130	104	101		243	7	216		158	29	78	77	42	55	96				7	127	100		46		13
WPR	**27**	**27**	**34**	**34**	**39**	**44**	**46**	**45**	**49**	**50**	**59**	**50**	**49**	**46**	**46**	**51**	**54**	**53**	**50**	**49**	**47**	**47**	**47**	**57**	**67**	**73**	**75**	**77**

Rates are per 100 000 population. From 1995 on, number shown is notification rate of new and relapse cases. Figures for all years are updated as new information becomes available and/or techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.15 **New smear-positive cases notified, Western Pacific, 1990–2007**

	Number of cases																	
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
American Samoa				1	4		0	6	2	3	2	2	1	2	2	3	3	0
Australia				557				226	203	285	251	228	210	113	285	241	269	281
Brunei Darussalam				68				0		102	84	95	112	121	115	101	128	136
Cambodia					11 058	11 101	12 065	12 686	13 865	15 744	14 822	14 361	17 258	18 923	18 978	21 001	19 294	19 421
China				84 898	104 729	134 488	203 670	236 021	202 817	201 775	204 765	204 591	194 972	267 414	384 886	472 719	468 291	465 877
China, Hong Kong SAR			0	2 429		0	1 774	1 943	2 091	1 536	1 940	1 857	1 892	1 794	1 693	1 561	1 537	1 501
China, Macao SAR				108		141	258	325	276		160	157	147	138	128	136	144	138
Cook Islands	0	1	6	5	4	2	1	2	0	0	0	2	1	0	1	1	0	
Fiji	84	75	75	61	62	68	69	66	74	65	62	73	74	78	62	63	73	52
French Polynesia					38		37	41	34	33	29	0	28	21	30	21	24	19
Guam					40						43	47	31	0	22	27	21	5
Japan				17 890	16 770	14 367	12 867	13 571	11 935	12 909	11 853	11 408	10 807	10 843	10 471	10 931	10 159	9 433
Kiribati				99	184		144	50	52	59	54	64	82	99	142	124	129	103
Lao PDR						478	886	1 234	1 494	1 706	1 526	1 563	1 829	1 866	2 226	2 806	3 041	3 080
Malaysia				6 954	6 861	6 688	7 271	7 496	7 802	8 207	8 156	8 309	7 958	7 989	7 843	8 446	9 414	9 578
Marshall Islands				12			12		11	17	11	15	18	20	39	48	45	19
Micronesia						9	14	9	14		15	8	22	26	35	32	41	47
Mongolia	0		0	0	145	455	769	1 171	1 356	1 513	1 389	1 631	1 670	1 541	1 808	1 868	2 129	1 856
Nauru					2					2	4	2	2	1		0	2	3
New Caledonia				16	28	21	26	24	26	22	20	19	21	12	15	16	9	12
New Zealand				91	61	78	90	83	106	94	74	68	88	106	111	83	97	81
Niue				0	0	0	1	0	0	1	0	0	1	0	0	0	0	0
Northern Mariana Islands						14	26	21	26	15	27	19	21	16	14	15	15	14
Palau				8	11	9	4	7		20			9	5	5	3	6	5
Papua New Guinea						1 652	447	1 195	2 107	2 140	1 933	1 351	1 345	2 310	1 896	1 805	1 948	2 087
Philippines				92 279	87 401	94 768	86 695	80 163	69 476	73 373	67 056	59 341	65 148	72 670	78 163	81 647	85 740	86 566
Rep. of Korea				16 630	13 266	11 754	11 420	9 957	10 359	9 559	8 216	11 805	11 345	10 976	11 471	11 638	11 513	10 927
Samoa				21	18	15	9	14	7	17	13	11	19	12	11	11	13	
Singapore				513	861	455	519	436	482	465	248	357	549	583	501	552	537	504
Solomon Islands				155	114	109	90	113	140	93	109	118	108	138	152	169	124	142
Tokelau					0	1	0			0	0	0		0		0	0	0
Tonga				16	17	9	14	11	16	10	15	8	23	11	8	11	14	14
Tuvalu				2	1	6				0	0	0	0	0		5	4	12
Vanuatu					62	30	50	66	38	43	63	57	38	40	59	35	42	41
Viet Nam						37 550	48 911	50 016	54 889	53 805	53 169	54 238	56 698	55 937	58 394	55 492	56 437	54 457
Wallis & Futuna						3	3	1				1	1	7		1		1
WPR	**84**	**76**	**81**	**222 813**	**241 737**	**314 271**	**388 142**	**416 954**	**379 698**	**383 613**	**376 109**	**371 806**	**372 528**	**453 812**	**579 566**	**671 612**	**671 243**	**666 412**

	Rate (per 100 000 population)																			
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
American Samoa				2	8		0	11	4	5	4	3	2	3	3	5	5	0
Australia				3				1	1	2	1	1	1	1	1	1	1	1
Brunei Darussalam				24				0		31	25	28	32	34	31	27	34	35
Cambodia					100	97	103	106	113	126	116	110	130	140	138	150	136	134
China				7	9	11	17	19	16	16	16	16	15	21	29	36	35	35
China, Hong Kong SAR			0	41		0	28	30	32	23	29	28	28	26	24	22	22	21
China, Macao SAR				27		34	62	77	64		36	35	32	30	27	29	30	29
Cook Islands	0	6	33	28	22	11	6	11	0	0	0	13	7	0	7	7	0	
Fiji	12	10	10	8	8	9	9	8	9	8	8	9	9	10	8	8	9	6
French Polynesia					18		17	18	15	14	12	0	11	8	12	8	9	7
Guam					28						28	30	19	0	13	16	12	3
Japan				14	13	11	10	11	9	10	9	9	8	8	8	9	8	7
Kiribati				132	241		184	63	64	71	64	75	94	112	157	135	138	108
Lao PDR						10	18	25	30	33	29	29	34	34	40	50	53	53
Malaysia				36	34	32	34	35	35	36	35	35	33	32	31	33	36	36
Marshall Islands				24			23		21	33	21	28	34	37	70	85	78	32
Micronesia						8	13	8	13		14	7	20	24	32	29	37	42
Mongolia	0		0	0	6	19	32	48	56	62	56	66	67	61	71	72	82	71
Nauru					20					20	40	20	20	10		0	20	30
New Caledonia				9	15	11	13	12	13	10	9	9	9	5	7	7	4	5
New Zealand				3	2	2	2	2	3	2	2	2	2	3	3	2	2	2
Niue				0	0	0	45	0	0	51	0	0	57	0	0	0	0	0
Northern Mariana Islands						24	43	34	40	22	39	27	29	21	18	19	18	17
Palau				50	66	53	23	39		106			46	25	25	15	30	25
Papua New Guinea						35	9	24	41	41	36	24	24	40	32	30	31	33
Philippines				141	130	138	124	112	95	98	88	76	82	90	94	97	99	98
Rep. of Korea				38	30	26	25	22	22	21	18	25	24	23	24	24	24	23
Samoa				13	11	9	5	8	4	10	7	6	11	7	6	6	7	
Singapore				16	26	13	14	12	13	12	6	9	13	14	12	13	12	11
Solomon Islands				45	32	30	24	30	36	23	26	28	25	31	33	36	26	29
Tokelau					0	68	0			0	0	0		0		0	0	0
Tonga				17	18	9	14	11	16	10	15	8	23	11	8	11	14	14
Tuvalu				21	10	61				0	0	0	0	0		48	38	114
Vanuatu					37	17	28	37	21	23	33	29	19	20	28	16	19	18
Viet Nam						51	66	66	71	69	67	68	70	68	70	65	65	62
Wallis & Futuna						21	21	7				7	7	47		7		7
WPR	**< 1**	**< 1**	**< 1**	**14**	**15**	**20**	**24**	**25**	**23**	**23**	**22**	**22**	**22**	**26**	**33**	**38**	**38**	**38**

Rates are per 100 000 population. Figures for all years are updated as new information becomes available and/or techniques are refined, so they may differ from those published previously. Data can be downloaded from www.who.int/tb

Table A3.16 **NTP budgets, available funding, cost of utilization of general health-care services and total TB control costs (US$ millions), Western Pacific, 2009**

	NTP budget	Available funding: Government (excluding loans)	Available funding: Loans	Available funding: Grants (excluding Global Fund)	Available funding: Global Fund	Funding gap	Cost of utilization of general health-care services	Total TB control costs	Completeness of budget data
American Samoa	0.1	0.1	0	0	0	0		0.1	C
Australia									N
Brunei Darussalam	0.6	0.6	0	0	0	0		0.6	P
Cambodia	11	1.1	0	1.3	4.6	3.7	2.5	13	C
China	225	163	11	0.7	41	9.8		225	C
China, Hong Kong SAR	20	20	0	0	0	0	58	79	C
China, Macao SAR									N
Cook Islands									N
Fiji									N
French Polynesia									N
Guam	1.7	1.4	0	0.3	0	0.02		1.7	C
Japan							165	165	N
Kiribati	0.1	0.1	0	0	0	< 0.01	0.1	0.2	C
Lao PDR	3.1	0.04	0	0	3.0	0		3.1	C
Malaysia	0.8	0.8	0	0	0	0	9.0	9.8	C
Marshall Islands	0.2	0.1	0	0.1	0	0		0.2	C
Micronesia									N
Mongolia	3.8	0.8	0	0	2.2	0.7	1.2	4.9	C
Nauru									N
New Caledonia									N
New Zealand									N
Niue	< 0.01	0	0	0	< 0.01	0		< 0.01	N
Northern Mariana Islands	0.6	0.2	0	0.3	0	0.2		0.6	C
Palau	0.2	0.1	0	0.1	0.02	0.01		0.2	C
Papua New Guinea	3.6	0.6	0	0.3	2.7	0		3.6	C
Philippines	23	7.9	0	0	10	4.4	11	34	C
Rep. of Korea									N
Samoa									N
Singapore									N
Solomon Islands	1.7	0.01	0	0	1.7	0	0.3	2.0	C
Tokelau	0	0	0	0	0	0		0	N
Tonga	0.1	0.1	0	< 0.01	0	< 0.01	< 0.01	0.1	C
Tuvalu	0	0.1	0	0	0	< 0.01		0	P
Vanuatu							0.2	0.2	N
Viet Nam	13	5.3	0	4.3	3.9	0	13	27	C
Wallis & Futuna									N
WPR	**308**	**202**	**11**	**7**	**70**	**19**	**261**	**570**	**47%**

N indicates data not available or not applicable; P indicates partial financial data; C indicates complete data and therefore included in analysis presented in chapter 3. Completeness of budget data in total row indicates percentage of countries providing complete financial data. Data can be downloaded from www.who.int/tb

Notes

China, Hong Kong SAR

FIGURE 2.12: at least one case of XDR-TB was reported by the end of 2008.

TABLE A3.8: the majority of treatment-after-failure cases are still on treatment at 12 months.

China, Macao SAR

TABLE A3.5: 41 cases treated outside the public sector, with site and history of treatment unspecified, were reported as "other", non-DOTS.

Japan

TABLE A3.8: cases not evaluated include some cases still on treatment.

ANNEX 4

Surveys of tuberculosis disease and availability of death registration data at WHO, by country and year

Table A4.1 **National and subnational surveys of prevalence of tuberculosis disease**

Table A4.1.1 National surveys[1]

Bangladesh	1964, 1987
Cambodia	2002
China	1979, 1984, 1990, 2000
Eritrea	2005
Gambia	1960
Ghana	1957
Indonesia	2004
Iraq	1970
Japan	1953, 1958, 1963, 1968
Kenya	1948, 1958
Liberia	1959
Libyan Arab Jamahiriya	1976
Malaysia	2003
Mauritius	1958
Myanmar	2006
Netherlands	1970
Nigeria	1957
Pakistan	1959, 1987
Philippines	1981, 1997, 2007
Rep. of Korea	1965, 1970, 1975, 1980, 1985, 1990, 1995
Samoa	1975
Sierra Leone	1958
Somalia	1956
Sri Lanka	1970
Uganda	1958
Viet Nam	2007

Table A4.1.2 Subnational surveys[1]

Afghanistan	1982
Bangladesh	1995, 2001, 2002, 2006
Botswana	1981, 1995
Brunei Darussalam	1985
China	1957, 1959
Cambodia	1981, 1982, 1983, 1984, 1985, 1988, 1995, 1998
Colombia	1988
Cyprus	1963
Egypt	2007
Ethiopia	2001
India	1948–1993 (numerous surveys), 2007, 2008
Indonesia	1979, 1983–1993, 1994
Iraq	1961
Japan	1954, 1964
Kenya	1958, 2006
Liberia	1959
Malawi	1960
Malaysia	1970
Mozambique	1961
Myanmar	1972, 1989, 1990, 1991, 1994, 2006
Nepal	1965, 1976, 1994
Nigeria	1957, 1973
Pakistan	1962
South Africa	1972–1985
Spain	1991
Syrian Arab Republic	1960
Thailand	1962, 1970, 1977, 1983, 1987, 1991, 2007
Tunisia	1957, 1961
Turkey	1971
Uganda	2000
UR Tanzania	1958
Viet Nam	1961
Zambia	1980, 2006

Table A4.1.3 Planned or recommended surveys (national or subnational)[2]

Afghanistan	2010
Bangladesh[3]	2008
Cambodia[3,4]	2010
China[3]	2010
Djibouti[4]	2010
Ethiopia	ND
Gambia	2010
Ghana[3]	2010
Indonesia[3]	2014
Kenya[3]	2010
Lao PDR[4]	ND
Malawi[3,4]	2009
Mali[3]	2009
Myanmar[3]	2009
Mozambique[3]	ND
Nigeria[3,4]	2009
Pakistan[3]	2009
Philippines[3]	ND
Rwanda[3,4]	2010
Sierra Leone[3]	ND
South Africa[3]	2010
Syrian Arab Republic[4]	2012
Thailand[3,4]	2011
UR Tanzania[3]	2008
Uganda[3,4]	2009
Viet Nam[3]	ND
Zambia[3,4]	2010

ND indicates not determined.

[1] Exact timing of surveys not always clear from reports; year given here is year in which survey apparently started. In some cases more than one subnational survey was completed in a country in a given year. Detailed reference list available at www.who.int/tb. References to surveys done in 2006 and 2007 have generally not yet been published in peer reviewed journals, but will be added to the web site when they are published.

[2] Countries indicating on the data collection form that they are planning to undertake a prevalence of disease survey in the near future but for which this information has not been confirmed are not included here. These tables will be updated as the information is confirmed. See www.who.int/tb

[3] The WHO Task Force on TB Impact Measurement has recommended that these 21 countries should carry out two prevalence of TB disease surveys between now and 2015 (or one more survey if at least one survey was done between 1990 and 2007). These surveys are needed as part of an effort to produce credible regional and global assessments of progress towards the 2015 impact targets, as well as for demonstrating the impact of control programmes on the burden of TB (see Chapter 1 for definition of the impact targets and Chapter 2 for an explanation of how the 21 countries were selected). For those countries that already have concrete plans (protocols and funding) to carry out at least one survey in the near future the expected year when the survey will start is provided.

[4] Funding for surveys in these countries has been approved by the Global Fund.

Table A4.2 **Availability of death registrations by cause of death, WHO Mortality Database, 2008**

	Cov[1]	Qual[1]	Year(s)
Albania	72	L	1987–1989, 1992–2004
Anguilla	–	–	1985–1995, 2000–2001, 2003–2006
Antigua & Barbuda	74	M	1985–1995, 2000–2004
Argentina	100	L	1985–2005
Armenia	63	L	1985–2003
Aruba	–	–	1987
Australia	100	H	1985–2003
Austria	99	H	1985–2006
Azerbaijan	68	M	1985–2004
Bahamas	83	H	1985, 1987, 1993–2000
Bahrain	83	L	1985, 1987–1988, 1997–2001
Barbados	76	M	1985–1995, 2000–2001
Belarus	98	M	1985–2003
Belgium	100	M	1985–1997
Belize	81	M	1986–1987, 1989–1991, 1993–2001
Bermuda	–	–	1985–2002
Bosnia & Herzegovina	88	L	1985–1991
Brazil	79	M	1985–2004
British Virgin Islands	–	–	1985–2003
Brunei Darussalam	100	M	1996–2000
Bulgaria	100	M	1985–2004
Canada	100	H	1985–2004
Cayman Islands	–	–	1985–2000, 2004
Chile	94	H	1985–2005
China, Hong Kong SAR	–	–	1985–2006
China, Macao SAR	–	–	1994
Colombia	78	M	1985–2002, 2004–2005
Costa Rica	88	H	1985–2005
Croatia	95	M	1985–2006
Cuba	100	H	1985–2005
Cyprus	70	L	1999–2000, 2004, 2006
Czech Republic	100	M	1985–2005
Denmark	100	M	1985–2001
Dominica	100	M	1985–2004
Dominican Republic	–	–	1985–1992, 1994–2001, 2003–2004
Ecuador	74	M	1985–2005
Egypt	81	L	1987, 1991–1992, 2000
El Salvador	75	L	1990–1993, 1995–2005
Estonia	100	H	1985–2005
Fiji	100	L	1999
Finland	100	H	1985–2006
France	100	M	1985–2005
Georgia	97	M	1985–1992, 1994–2001
Germany	99	M	1985–2006
Greece	99	L	1985–2006
Grenada	86	M	1985, 1988–1996, 2001–2002
Guatemala	89	M	1986–2004
Guyana	72	L	1988–1996, 1998–1999, 2001–2005
Haiti	–	–	1997, 1999, 2001–2003
Honduras	–	–	1987–1990
Hungary	100	H	1985–2005
Iceland	95	H	1985–2006
Iran (Islamic Republic of)	66	L	1985–1987
Ireland	100	H	1985–2006
Israel	100	H	1985–2004
Italy	100	M	1985–2003
Jamaica	60	L	1985–1991
Japan	100	H	1985–2006
Kazakhstan	77	M	1985–2006
Kiribati	76	L	1991–2001
Kuwait	100	H	1985–1987, 1993–2002
Kyrgyzstan	70	M	1985–2006
Latvia	93	H	1985–2006
Lithuania	98	H	1985–2006
Luxembourg	96	M	1985–2005
Malaysia	–	M	1997
Maldives	51	L	2000–2005
Malta	95	H	1985–2005
Mauritius	93	M	1985–2005
Mexico	95	H	1985–2005
Monaco	–	–	1986–1987
Mongolia	84	M	1994
Montserrat	–	–	1990–2003
Netherlands	100	M	1985–2006
New Zealand	100	H	1985–2004
Nicaragua	58	L	1988–1994, 1996–2005
Norway	98	M	1985–2005
Panama	91	M	1985–1989, 1996–2004
Paraguay	74	L	1985–1991, 1994–2004
Peru	54	L	1986–1992, 1994–2000
Philippines	85	M	1992–1998
Poland	100	L	1985–1996, 1999–2006
Portugal	100	M	1985–2003
Puerto Rico	–	–	1985–2003, 2005
Qatar	83	L	1995
Rep. of Korea	87	M	1985–2006
Republic of Moldova	80	H	1985–2006
Romania	100	H	1985–2007
Russian Federation	99	M	1985–2006
Saint Kitts & Nevis	100	M	1985–2005
Saint Lucia	99	M	1986–2002
San Marino	73	L	1995–2000, 2002, 2005
Sao Tome & Principe	–	–	1985–1987
Serbia	–	–	2004–2006
Serbia & Montenegro	89	M	1997–2002
Seychelles	100	M	1985–1987, 2001–2005
Singapore	82	H	1985–2006
Slovakia	98	H	1992–2005
Slovenia	100	M	1985–2006
South Africa	79	L	1993–2005
Spain	100	M	1985–2005
Sri Lanka	74	L	1985–1989, 1991–1992, 1995
St Vincent & Grenadines	93	H	1985–1987, 1990, 1995–2003
Suriname	73	M	1985–1992, 1995–2000
Sweden	100	M	1985–2005
Switzerland	99	M	1985–2005
Syrian Arab Republic	100	L	1985
TFYR Macedonia	–	–	1991–2003
Tajikistan	54	L	1985–2005
Thailand	87	L	1985–1987, 1990–1992, 1994–2000, 2002
Trinidad & Tobago	83	H	1985–2002
Turkey	–	–	1987
Turkmenistan	76	M	1985–1998
Turks & Caicos Islands	–	–	1985–2005
US Virgin Islands	–	–	1997–2003, 2005
USA	100	H	1985–2005
USSR, Former	–	–	1985–1989
Ukraine	100	M	1985–2005
United Kingdom	99	H	1985–1999, 2001–2006
Uruguay	100	M	1985–1990, 1993–2001, 2004
Uzbekistan	73	H	1985–2000, 2002–2005
Venezuela	99	H	1985–1990, 1992–1994, 1996–2005
Yugoslavia, Former	–	–	1985–1989
Zimbabwe	–	–	1990

Shown are years for which cause-of-death data (1985–2007) were available in the WHO Mortality Database by August 2008 (see also www.who.int/healthinfo/morttables). In some cases more recent data are available in the country in question, but have not yet been sent to WHO.

[1]Cov, Qual: Coverage and quality. Coverage is calculated by dividing the total deaths reported for a country in a given year from the vital registration system by the total deaths estimated by WHO for that year for the national population (shown is coverage for most recent year, but not for data before 2000). Coverage can be low because vital registration is implemented in only part of the country, or because only a proportion of deaths is recorded, or both. Source: EIP/WHO. Assessment of data quality based on coding system used, and on proportion of deaths assigned to ill-defined codes; L, indicates low; M, medium; H, high. Source: Mathers, C et al. Counting the dead and what they died from: an assessment of the global status of cause of death data. *Bulletin of the World Health Organization*, 2005, 83: 171–177.

The World Health Organization monitors the global tuberculosis epidemic in support of national TB control programmes.

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